
Enhancing Mental Health and Well-Being Through the Integration of Mandala Creation and Shinrin–Yoku: A Synergistic Approach

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Abstract

Mandala creation and Shinrin-yoku (eng. forest bathing) are recognized for their stress-reducing capabilities. Integrating these practices could enhance the therapeutic effects of Shinrin-yoku sessions. Combining mandala-making with Shinrin-yoku may amplify the stress-relieving benefits of both practices. The meditative aspects of mandala creation can enhance the presence awareness (mindfulness) and relaxation experienced during Shinrin - Yoku, potentially leading to more significant reductions in stress and improvements in emotional well-being by fostering a deeper connection with nature.

This paper explores mandala creation's effects on mental well-being in Shinrin-yoku settings.

The central hypothesis is that integrating these activities could be particularly beneficial in structured programs where participants engage in mandala-making in a natural forest setting, thereby harnessing the calming effects of art and nature.

Shinrin-yoku - is a practice with deep cultural roots and significant health benefits that has successfully transcended its Japanese origins to become a global wellness phenomenon. Shinrin-yoku harnesses the calming effects of nature to reduce stress on both psychological and physiological levels. Extensive research, including systematic reviews and meta-analyses, has demonstrated that Shinrin-yoku significantly lowers blood pressure and salivary cortisol levels, reducing stress among urban residents. Moreover, it is well-established that the regular practice of Shinrin-yoku enhances emotional states and fosters a vital sense of connectedness to nature, which is crucial for effective stress management. Additionally, it consistently improves mood states, reducing tension, depression, and anger.

Mandalas, symbolic representations of the universe, have been used for centuries in religious and therapeutic contexts to promote mindfulness, self-awareness, and emotional well-being. Mandala-making and mandala coloring therapy (MCT) are creative processes that encourage focused awareness and self-expression, significantly reducing stress and improving emotional well-being. Mandala-making may involve selecting natural materials from the forest to design a personalized mandala or, during MCT, choosing a mandala design and coloring materials, with a facilitator guiding participants to focus on the present moment and their emotions without judgment (mindfulness). Empirical studies have demonstrated that mandala-making within a

natural environment can effectively lower stress levels, anxiety, and depression.

The therapeutic approach that combines the meditative and creative aspects of mandala art with the therapeutic effects of natural environments, particularly forests, offers a holistic method to improve psychological health.

While both mandala-making (including mandala coloring) and Shinrin - Yoku independently offer unique benefits for stress reduction, their integration provides a more holistic approach to managing stress. This combination leverages the meditative and creative aspects of mandala creation with the restorative power of nature, leading to enhanced therapeutic outcomes.

To fully understand and optimize this integrative approach, further research should focus on the potential synergistic benefits and the best ways to integrate these therapies in various settings and populations. It is also essential to consider individual preferences and cultural contexts when designing integrated therapy programs.

Keywords: CAM, mindfulness, relaxation therapy, Shinrin-yoku, mandala

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Introduction

Shinrin-Yoku

Defining Shinrin-Yoku and Its Growing Relevance

Shinrin-yoku is a practice that involves immersing oneself in a forest environment to absorb its sensory experiences, promoting physical and mental well-being. Originating in Japan in the early 1980s, it has since gained global recognition for its therapeutic benefits. This practice is deeply rooted in the cultural and natural landscapes of Japan, where it was initially developed as a response to increasing urbanization and lifestyle-related stress. The following sections explore the origins, cultural significance, and global expansion of Shinrin-yoku.

Forest bathing (jap. Shinrin-Yoku) and forest therapy (jap. Shinrin-Ryoho) are two practices that stem from the concept of connecting with nature, but they have distinct differences in their implementation and purpose. While both forest bathing and forest therapy share the common goal of promoting health through nature, they differ significantly in their approach, structure, and implementation. Forest bathing is more informal and can be done independently, while forest therapy is a guided experience designed to achieve specific therapeutic outcomes through structured activities. Shinrin-yoku was officially introduced in Japan in 1982 as a part of a national public health program. It was designed to offer an antidote to the stress and health issues associated with urban living by encouraging people to reconnect with nature through mindful forest immersion. The Japanese concept of Shinrin-yoku emphasizes the healing power of nature and the importance of immersing oneself in the forest environment for overall health and wellness. (Kotera & Rhodes 2020).

The practice is deeply embedded in Japanese culture, which traditionally values harmony with nature. This cultural backdrop has facilitated the acceptance and integration of Shinrin-yoku into Japanese healthcare and wellness practices (Kotera & Rhodes 2020).

While initially rooted in Japan, Shinrin-yoku has gained popularity worldwide, particularly in Europe and North America. This expansion is driven by growing awareness of the health benefits of nature exposure and the increasing interest in alternative and complementary therapies (Vermeesch et al. 2024), (Simonienko et al. 2020)

Health Benefits of Shinrin-Yoku: Physiological and Psychological Impacts

Shinrin-yoku harnesses the proven calming effects of nature to effectively reduce stress on psychological and physiological levels.

Research has consistently shown that Shinrin-yoku has significant physiological and psychological benefits, including stress reduction, improved mood, and enhanced immune function. These benefits have been documented across various age groups and settings, highlighting the practice's universal applicability (Vermeesch et al., 2024) (Sood, 2023).

Extensive research and numerous studies, including systematic reviews and meta-analyses, have unequivocally demonstrated that Shinrin-Yoku significantly lowers blood pressure and salivary cortisol levels, reducing stress among urban residents (Qiu et al. 2022).

Shinrin Yokus is a practice that involves immersing oneself in a forest environment to promote health and well-being. This practice has gained attention for its potential health benefits, which span physiological, psychological, and emotional domains. The following sections explore these benefits in detail, drawing on insights from recent research.

Shinrin Yoku has been shown to lower blood pressure and heart rate, which can help prevent and manage hypertension. This is achieved through the reduction of stress hormones and the enhancement of parasympathetic nervous system activity, which stabilizes the autonomic nervous system balance (Li, 2022) (Rybak et al., 2022)

Engaging in Shinrin - Yoku can increase natural killer (NK) cell activity and the production of anti-cancer proteins, suggesting a potential role in cancer prevention (Li, 2022).

The practice has been associated with better sleep quality and increased levels of beneficial hormones such as adiponectin and dehydroepiandrosterone sulfate, contributing to overall health maintenance (Li, 2022).

Shinrin - Yoku significantly reduces stress by lowering stress hormones like cortisol and adrenaline levels. This stress reduction is linked to improved mood and decreased symptoms of anxiety and depression (Li, 2022) (Kavanaugh et al., 2022)

Participants in Shinrin - Yoku report decreased negative mood states such as tension, anger, and fatigue while experiencing increased vigor and positive mood states. These effects are particularly pronounced in males, as

shown in studies measuring mood state profiles (Wen et al., 2023) (Li, 2022).

Although a single Shinrin Yoku session may not significantly alter chronic burnout symptoms, it can improve mental well-being and reduce stress, which are critical components of burnout management (Kavanaugh et al. 2022).

Spending time in forest environments can enhance cognitive functions and emotional regulation. This is partly due to the forest's calming and restorative nature, which allows for mental relaxation and rejuvenation (Montag, 2023).

Individual Differences and Influencing Factors

The benefits of Shinrin Yoku can vary by gender, with females experiencing more pronounced physiological benefits, such as enhanced parasympathetic activity, while males may experience greater mood improvements (Wen et al. 2023).

Individuals with higher tendencies towards Shinrin Yoku report greater life satisfaction, which is partially mediated by personality traits such as openness to experience. This suggests that Shinrin-Yoku can improve overall life satisfaction and well-being (Montag, 2023).

While short-term benefits are well-documented, ongoing research is needed to fully understand the long-term health outcomes of regular Shinrin-Yoku practices. This includes its potential role in disease prevention and health promotion across different populations (Vermeesch et al., 2024) (Balmumcu & Pekince, 2023).

Challenges, Research Limitations and Future Directions

However, the methodological quality of some studies has been questioned, prompting calls for more rigorous research to validate these findings (Sood, 2023). While Shinrin Yoku offers numerous health benefits, it is essential to consider the limitations of current research. Many studies have small sample sizes and may need to be more generalizable across different populations. Additionally, the effects of Shinrin - Yoku can be influenced by individual differences, such as personality traits and baseline health conditions. Further research is needed to explore these nuances and to establish standardized protocols for integrating Shinrin Yoku into health promotion and disease prevention strategies.

While Shinrin-yoku is celebrated for its health benefits, it is essential to consider the broader implications of its practice. The increasing popularity of Shinrin - Yoku raises questions about the sustainability of natural environments and the potential for commercialization.

Additionally, while the practice is rooted in Japanese culture, its global adaptation may lead to variations that diverge from its original intent. These considerations highlight the need for a balanced approach that respects both the cultural origins and the ecological impact of Shinrin-yoku.

Mandalas

History and Origin of Mandalas

The tradition and history of using mandalas are deeply rooted in spiritual, cultural, and therapeutic practices across various civilizations. Originating from ancient spiritual traditions such as Hinduism, Buddhism, and Jainism, mandalas have evolved to serve multiple purposes, from religious rituals to modern therapeutic applications. This multifaceted symbol represents the universe and is used as a meditative aid, psychological healing tool, and architectural design framework.

Spiritual and Religious Significance

Mandalas are an integral part of spiritual practises, especially in Hinduism and Buddhism, where they symbolise the universe and are used in meditation and rituals. The creation and destruction of sand mandalas in Tibetan Buddhism, for example, illustrates the concept of impermanence and is used to aid meditation and spiritual growth (Gordon et al., 2017).

In the Hindu and Buddhist traditions, mandalas are often used to represent the stages of the spiritual journey and the teachings of spiritual adepts. They serve as a visual representation of the cosmos and are meant to facilitate a deeper connection with the divine (Gordon et al., 2017) (Hayata, 2007).

Tibetan Buddhism, in particular, has a rich tradition of mandala creation, which is often referred to in Western psychotherapeutic practises. The Tibetan Buddhist mandala is considered the prototype for many therapeutic applications, despite differences in philosophical foundations between Eastern and Western interpretations (Snook, 2009).

Mandalas are of great importance in Japanese religion and tradition. They are intricate representations of sacred geography and spiritual concepts that are deeply embedded in the practises and beliefs of various Japanese religious traditions, including Buddhism and Shinto.

The concept of mandalas in Japan is rooted in Buddhist traditions, particularly those of Esoteric and Pure Land Buddhism. The Taima mandala, for example, is an iconic representation of Amitābha Buddha's Pure Land, and illustrates the doctrinal emphasis on enlightenment and rebirth in paradise (Winfield, 2019). The Taima mandala is a prominent example, showcasing elements like the celestial orchestra, including the symbolic gotokaku leaf horn. These mandalas reflect the deep-rooted influence of Buddhist beliefs and iconography in Japanese religious and artistic traditions, emphasizing spiritual symbolism and meditative practices. (Novikova 2022). Mandalas also play a crucial role in Shugendō, a syncretic religious tradition that combines elements of Buddhism, Shintoism, and mountain worship. In this context, mandalas are seen as multidimensional ritual landscapes that symbolise the spiritual and physical realms (DeWitt, 2017).

Integrating mandalas into Japanese religious practices reflects a broader historical trend of cultural and religious exchange across Asia, where Buddhist hermeneutics and ritual practices evolved through interactions with Chinese and Indian traditions (Willis, 2014), (Sharf, 1999).

Japanese mandalas

Japanese mandalas are not only religious symbols but also artistic masterpieces. The Two-World mandalas, depicting the Diamond and Womb Worlds, are prime examples of the intricate iconography used to convey complex Buddhist cosmologies (Winfield, 2019).

The gotokaku leaf horn, a rare musical instrument depicted in mandalas from the Muromachi and Edo periods, show how integrating artistic elements can be combined with religious symbolism. This instrument is associated with the celestial music motif in Pure Land Buddhism, emphasizing the harmonious nature of Amitābha's paradise (Novikova, 2022).

The jewelled stupa mandalas of the early medieval period are an example of innovative forms of artistic expressions, where sutra texts are visually transformed into stupas.

Age and religious doctrine (O'Neal, 2011) (O'Neal, 2015). Mandalas in Japan often embody a syncretic blend of Buddhist and Shinto elements, as seen in the Bugaku Mandala-ku ritual, which combines indigenous Shinto practises with Buddhist influences. This syncretism is a hallmark of the Japanese religious tradition and emphasises illustrating the fluid boundaries between different spiritual systems (Furukawa et al. 2018).

The representation of sacred geography in mandalas also reflects the integration of pre-Buddhist Chinese concepts with indigenous Japanese beliefs. This can be seen in the spatial demarcation of sacred realms and in the use of geographical motifs in mandala compositions (Sharf, 1999), (Grotenhuis, 1998).

Although mandalas in Japan are primarily associated with Buddhist traditions in Japan, their significance goes beyond religious boundaries. They serve as cultural artifacts that reflect the historical and artistic evolution of Japanese spirituality. The study of mandalas reveals the dynamic interplay between indigenous and foreign influences, and illustrates the adaptability and resilience of Japanese religious practises. This multifaceted role of mandalas underscores their enduring importance in historical and contemporary contexts.

Mandalas in various therapeutic settings

Mandalas are used in various therapeutic settings to support in emotional expression and healing.

The use of mandalas in therapeutic and healing practices has gained much attention due to their potential benefits in promoting emotional wellness, reducing stress, and improving psychological well-being. With their intricate patterns and symbolic meanings, the Mandalas serve as a meditative tool that facilitates mindfulness and self-expression. This therapeutic approach is applied in various contexts, from traditional art therapy to innovative virtual reality systems, and addresses various psychological and physiological conditions.

The use of mandalas in therapy is based on the concept of archetypal patterns. Archetypal patterns can help individuals cope with personal transitions and challenges, making them a valuable tool in psychological healing (Vennet & Ciancio, 2023).

The psychologist Carl Jung advocated mandalas as a means of inner reconciliation and wholeness. He noted,, that they have a calming effect on the individual and help in processing thoughts and emotions,

and regarded them as symbols of the self and a means of achieving psychological wholeness and integration. Jung's use of mandalas aimed to facilitate the individuation process, helping individuals achieve higher levels of consciousness and self-understanding (Miller, 2005).

Mandalas, circular pattern symbolizing the universe, are used in art therapy to promote meditation and self-reflection. They help individuals to explore their inner selves and can effectively reduce stress and anxiety (Vennet & Ciancio, 2023).

Drawing mandalas has a calming effect on individual and helps to process thoughts and emotions. In healthcare, mandalas are widely employed as a healing tool for various conditions such as cancer, depression, PTSD, grief, substance abuse, and addiction. The intricate circular designs of mandalas have been found to assist individuals in coping with terminal illnesses and psychological distress. (Stalin & Joy 2018).

A systematic review of mandala art therapy (MA) suggests that it can alleviate negative symptoms, strengthen hope, and reduce physiological indicators of stress in patients. However, the evidence is preliminary, and further high-quality studies are needed to confirm these benefits (Zhang et al., 2023).

Mandala therapy has been shown to reduce depressive symptoms in older people and improve their autonomy and daily functioning. This suggests its effectiveness as a therapeutic tool in occupational therapy settings for older adults with depression (Garros & Machado, 2019).

Research involving university students showed that mandala art significantly reduced symptoms of depression, anxiety, and stress. This supports the hypothesis that therapeutic art activities can reduce psychological distress (Raimaini & Zahit, 2023).

Mandala art therapy has been applied to manage chronic pain, e.g. in patients with endometriosis. It has shown significant reduction in pain levels, indicating its potential as a supportive treatment alongside medical interventions (St, 2023).

Mandala Colouring Therapy (MCT) is known to reduce symptoms of stress, anxiety, and depression (SAD syndrome) by promoting relaxation and mindfulness. It is particularly effective in reducing symptoms of trauma and stress-anxiety-depression (SAD) syndrome. The process involves selecting a mandala design and coloring materials. Participants are guided by the facilitators to focus on the present moment and allow their emotions to flow freely without judgement. Participants en-

gage in a creative process that allows emotions to surface without judgment, leading to improved emotional states and insights into personal stressors (Wang & Chia 2024).

With its colour symbolism, the Balinese mandala is used for emotional balance and psychological healing. This practice emphasizes the importance of colour in therapeutic art, where participants explore various life aspects through color-healing techniques (Karja, 2022).

In a study involving haemodialysis patients, mandala coloring significantly improved fatigue severity and psychological well-being. Over an eight-week period, it also enhanced coping strategies, such as self-confidence and optimism, demonstrating its potential in medical settings to support mental health (Özer et al., 2024).

A meditation-based mandala program was effective in reducing distress, depression, and anxiety among caregivers of cancer patients, highlighting its applicability in supporting people in highly stressful caregiving roles (Yakar et al., 2023).

Mandala colouring has been shown to effectively reduce anxiety in hospitalized COVID-19 patients. A study demonstrated that a daily 30-minute mandala coloring session significantly decreased anxiety scores compared to standard care alone, suggesting its utility as a non-pharmaceutical intervention for anxiety management (Khademi et al., 2021).

Not only colouring already prepared mandalas but also creating them has been shown to offer various health benefits, particularly mental and emotional well-being. Creating mandalas can improve fatigue, psychological well-being, and coping with stress.

This practise, rooted in ancient spiritual traditions, has been adapted into modern therapeutic techniques to address a range of psychological issues. Several studies support the therapeutic benefits of mandala creation, highlighting its effectiveness in reducing stress, anxiety, and depression and improving overall psychological well-being.

A recent study showed that patients who coloured mandalas once a week for 2 hours over eight weeks, experienced reduced fatigue severity, enhanced psychological well-being, and improved coping strategies. Factors such as self-confidence, optimism, seeking social support, and reducing feelings of helplessness and submission were positively impacted. Therefore, engaging in mandala coloring can be a therapeutic practice con-

tributing to overall health and well-being, especially in individuals facing health challenges. (Özer et al. 2024).

A randomized controlled trial provides scientific evidence of the positive health outcomes of creating mandalas, indicating its potential as a supportive therapy in clinical settings. The research conducted on hospitalized adolescents with cancer showed that individual mandala drawing sessions significantly reduced psychological symptoms, anxiety, and depression. The results indicate that mandala drawing can be an effective intervention for improving mental health and well-being in this population. Therefore, this study supports mandala drawing as a therapeutic tool for promoting healing and reducing psychological distress. (Gürcan & Turan 2021).

Mandala art therapy has also been found to significantly reduce anxiety levels in cancer patients. A study comparing mandala painting with Sudoku found that mandala painting was more effective in reducing anxiety among breast cancer patients undergoing chemotherapy, with a notable decrease in anxiety scores post-intervention (Cheraghi et al., 2024).

Mandala colouring was also effective in reducing anxiety in women with early-stage breast cancer during their first chemotherapy session, particularly for those with high initial distress levels (Akbulak & Can 2022).

Beyond therapeutic benefits, creating mandalas can help patients with cancer by providing a non-invasive assessment tool to monitor their physical and emotional state. The mandala drawings allow patients to express their condition nonverbally, aiding in communication with healthcare providers. Mandalas offer therapeutic value, promoting psychological support, healing, and self-expression. By assessing mandalas, physicians can track patient well-being changes over time without causing anxiety or fear. This process can assist in understanding the patient's discomfort levels and overall state, contributing to a holistic approach to cancer treatment and care (Elkis-Abuhoff et al., 2009).

While creating mandalas shows promise in various contexts, it is crucial to consider its limitations and the need for further research. The evidence supporting its benefits is still developing, and more high-quality studies are necessary to understand its therapeutic potential fully.

Aim and hypothesis

This paper explores the effects of mandala creation in Shinrin - Yoku settings on mental well-being.

The central hypothesis is that the integration of these therapies into structured programmes where participants create mandalas in a natural forest environment could be particularly beneficial in order to harness the calming effects of art and nature.

The paper is written on a comprehensive literature search to identify relevant studies that explore the effects of Shinrin - Yoku and mandala creation on mental well-being. PubMed, PsycINFO, Web of Science, and Scopus were used to find peer-reviewed articles, systematic reviews, meta-analyses, and empirical studies published within the last ten years.

The search strategy included keywords “;” “Shinrin-Yoku,” “mandala,” “mandala creation,” The findings were discussed in the context of existing literature, highlighting the potential benefits of integrated nature and art therapy programs. The practical implications for designing structured programs that combine these therapies and gaps in the current research have been considered, and they require further investigation.

Results and discussion

The historical origins of mandalas in nature and forest therapy

The concept of mandalas extends beyond human-made art to natural patterns, which can serve as incentives for artistic expression and the development of intuitive awareness. In nature, mandalas can be seen in the circular patterns of flowers, tree rings, and other natural formations, which can encourage mindfulness and a sense of connection to the natural world (Vidović & Rupčić, 2019).

Mandalas serve as incentives for artistic expression and the development of intuitive awareness (Vidović & Rupčić, 2019).

While mandalas have a profound historical and cultural significance, their application in modern therapeutic practices, including forest therapy, highlights their versatility and enduring relevance. The integration of mandalas into therapy draws on their spiritual origins and leverages their natural occurrence to foster healing and personal growth. This duality of mandalas as both cultural symbols and natural patterns underscores their potential to bridge the gap between ancient wisdom and contemporary therapeutic needs.

Forest therapy, which involves immersive experiences in natural settings, can be enriched by incorporating mandalas. The natural symmetry and patterns found in forests can mirror the mandala's structure, providing a calming and centering experience for individuals coping with emotional difficulties (Berger & Tiry, 2012).

The historical origins of mandalas in Shinrin - Yoku are deeply rooted in ancient spiritual traditions and have evolved through various cultural and psychological frameworks. Mandalas, symbolic representations of the universe, have been used for centuries in religious and therapeutic contexts to promote mindfulness, self-awareness, and emotional healing. Their integration into Shinrin - Yoku combines these historical uses with contemporary therapeutic practices.

Enhancing Mental Health and Well-Being Through the Integration of Mandala Creation and Shinrin-Yoku

Integrating mandalas into Shinrin - Yoku represents a novel approach to enhancing the therapeutic benefits of nature-based interventions. This integration leverages the calming and meditative aspects of mandalas with the holistic healing environment of forests, offering a comprehensive therapeutic experience. Combining these elements can address psychological and physiological health, providing a multifaceted approach to therapy.

The spatial conditions of a forest, characterized by diverse landscape elements and visual appearances, provide an ideal backdrop for mandala creation. This environment can enhance the therapeutic effects of both practices, promoting a holistic sense of well-being (Ueda & Takayama, 2011).

Integrating mandalas into Shinrin - Yoku involves using these natural patterns to enhance the therapeutic experience. Creating mandalas in a forest setting encourages mindfulness and presence, two core principles of

forest therapy. As individuals collect natural materials (like leaves, stones, twigs, or flowers) and arrange them into a mandala, they become fully engaged in the process, paying attention to shapes, textures, colors, and patterns. This mindful engagement fosters a deeper connection to the present moment and to the environment around them.

By engaging with the mandala-like structures found in nature, individuals can achieve a balanced relationship with themselves and their environment, promoting holistic well-being. Incorporating mandala creation into this practice can further engage children, encouraging artistic expression and intuitive awareness (Vidović & Rupčić, 2019).

Making mandalas allows for creative expression and can be a form of emotional release. They can also be meditative and calming, helping to reduce stress and anxiety. They provide a nonverbal way to express emotions, thoughts, and feelings that may be difficult to articulate. The repetitive and symmetrical nature of mandala creation can also have a soothing effect on the mind.

Mandalas often carry symbolic meanings related to wholeness, balance, and unity. In forest therapy, creating a mandala can be an opportunity to set personal intentions or reflect on one's emotional or spiritual journey. As the mandala is created, individuals may imbue it with personal significance, using it as a metaphor for their inner landscape, growth, or healing process.

The act of creating a mandala in nature requires grounding oneself in the forest's sensory experience. Touching different textures (like rough bark or smooth pebbles), hearing leaves rustling, or feeling the earth beneath one's feet brings awareness to the body and the environment, fostering a sense of grounding and stability.

A study found that using reflective instructions while creating mandalas improved mindfulness and mood, suggesting that this activity can deepen the meditative experience of Shinrin - Yoku (Hartman & Campenni 2022).

Creating mandalas using forest resources involves utilizing natural materials and ecological practices to design these intricate patterns. Traditionally circular and symmetric, Mandalas can be crafted using various forest-derived elements, integrating artistic and ecological principles. This approach not only enhances creativity but also promotes sustainability and environmental awareness.

The bioethical meaning of making mandalas in Shinrin - Yoku involves integrating the therapeutic and symbolic aspects of mandalas with the ecological and ethical dimensions of forest environments. This synthesis can foster a deeper connection with nature, promote emotional healing, and encourage sustainable living practices. The creation of mandalas in Shinrin - Yoku bridges personal well-being and ecological consciousness, offering a holistic approach to therapy that aligns with bioethical principles.

Forests provide many organic materials that can be used in mandala creation. Individuals develop a more profound sense of connection to the natural world by using natural materials found in the forest to create mandalas. Gathering materials with intention — such as selecting specific leaves or stones — encourages a heightened awareness and appreciation of the forest's diversity and beauty. This activity helps participants see nature in a new light, noticing details and patterns they might have otherwise overlooked. For instance, vegetable residues and organic matter can be used for composting, which supports the growth of plants used in mandalas. This method was effectively demonstrated in an agroecological mandala project where organic waste was repurposed to cultivate various plants, including vegetables and aromatic herbs, which can be arranged into mandalas (Pereira et al. 2022).

Creating a mandala at the end of a Shinrin - Yoku session can serve as a way to integrate and reflect on the experience. It allows participants to consolidate their thoughts, feelings, and insights gained during their time in nature. The mandala becomes a visual representation of the personal transformation or healing, providing a tangible reminder of the experience.

Creating mandalas within Shinrin Yoku setting – a practical guide

Creating mandalas at the end of a Shinrin - Yoku is a simple yet profound practice that fosters mindfulness, creativity, and a deep connection to nature. Usually, it is necessary to follow general instructions to guide participants' experience and enhance the benefits of forest therapy.

To begin, find a quiet and peaceful spot in the forest where you feel comfortable and safe. This might be a clearing, a spot by a stream, or under a canopy of trees. Take deep breaths to center the mind and bring attention to the present moment. Then, set an intention for

the mandala-making—whether it is for peace, healing, clarity, or simply a desire to connect more deeply with nature.

Natural materials from the forest floor are to be gathered mindfully. A variety of items, such as leaves, flowers, twigs, bark, stones, pine cones, acorns, or feathers, should be looked for. Only abundant materials that will not harm the environment should be collected. Attention is paid to the colors, shapes, and textures, allowing intuition to guide the selection toward meaningful or visually appealing items.

A small, meaningful object—perhaps a unique leaf, flower, or stone — is chosen to serve as the center of the mandala. Then, a small, flat area on the ground should be cleared, gently moving aside any leaves or debris to create a clean space.

The chosen central object is placed in the middle of the cleared space. The gathered materials are then arranged around this central point, forming a circular pattern. Symmetry is focused on balancing similar objects or materials opposite each other. Rings, radiating lines, or spirals around the center can be created, with each item placed slowly and mindfully, with intention and awareness.

As the materials are arranged, all senses are engaged. The materials' textures, colors, and shapes are noticed, and their feeling in the hands is observed. The sounds of the forest, such as rustling leaves or birdsong, are heard, and the earth beneath is felt. Deep, slow breathing is maintained, allowing the experience to become a meditative practice.

When the mandala feels complete, a step back is taken to observe it from a distance. Its shape, symmetry, and the way different elements come together are noticed. A moment is taken to reflect on the process of creation. Thoughts, emotions, or insights that arose during the making are considered. Attention is paid to how the body and mind feel now compared to when the process began.

Gratitude is expressed for the materials used and for the forest that provided them. The environment and the experience are acknowledged, either silently or aloud. The mandala is left in place as an offering to the forest to be reclaimed by nature over time. This act of letting go serves as a symbol of connection to the environment and the intention set.

To integrate the experience, a few minutes are taken to journal or meditate on what was felt and discovered

during the process. Consideration is given to how the practice of creating a mandala in nature might influence daily life or continue to inspire moving forward. The sense of calm, presence, and connection is carried away from the forest, keeping the intention in mind.

As the Shinrin - Yoku concludes, a few moments are taken to transition back slowly. Gentle stretching, deep breathing, and a mindful walk back are practiced, maintaining a sense of gratitude and reflection. The overall experience is reflected upon, considering how it has contributed to a sense of peace, well-being, and connection to nature.

While integrating mandalas into Shinrin - Yoku offers numerous benefits, it is essential to consider individual preferences and needs. Not everyone may find mandala creation appealing or beneficial, and some may prefer other forms of artistic or meditative activities. Additionally, the effectiveness of this integration may vary based on the specific forest environment and the individual's connection to nature. Nonetheless, combining these practices holds promise for enhancing mental health and well-being.

Future Research Directions for Proving the Efficacy of Mandala Creation as Part of Shinrin Yoku practice

In recent years, there has been growing interest in alternative therapies that leverage natural environments and creative processes to enhance mental well-being. Shinrin-Yoku is a well-established practice known for its numerous physiological and psychological benefits, such as reduced stress, improved mood, and enhanced immune function. However, integrating creative art therapies, such as mandala creation, into Shinrin - Yokusettings is still a relatively novel area of exploration. While initial studies suggest promising outcomes, there remains a need for further research to confirm the efficacy of combining these two therapeutic modalities. Future research should address existing gaps, employ rigorous study designs, develop standardized protocols and outcome measures, explore individual differences, and investigate practical applications. By taking these steps, we can build a solid body of evidence that confirms the effectiveness of this innovative therapeutic approach and unlock its full potential for improving mental health.

To fully understand the benefits of integrating mandala creation into forest therapy, it is essential to address several existing gaps in the research. Firstly, there is a

need for more longitudinal studies that examine the long-term effects of combined therapies on mental well-being.

Short-term studies can offer valuable insights into acute stress relief and emotional regulation. Balancing the focus on short and long-term effects would create a more comprehensive research agenda.

Secondly, larger, more diverse sample sizes are needed. Existing studies often involve small and homogeneous groups, limiting the generalizability of the findings. Future research should aim to include participants from various demographic backgrounds, including different age groups, ethnicities, and socioeconomic statuses. This will help determine if the therapeutic benefits of mandala creation in forest settings are universally applicable or more effective for certain populations.

Moreover, exploring the mechanisms underlying the combined benefits of Shinrin - Yoku and mandala creation is essential. While both therapies are believed to reduce stress and improve emotional regulation, the specific processes for achieving these benefits remain unclear. Future studies should investigate the neurobiological and psychological pathways involved in the combined intervention. This could involve using advanced imaging techniques, such as functional MRI, to observe changes in brain activity during and after the practice and measure biomarkers such as cortisol, heart rate variability, electroencephalogram (EEG) and inflammatory markers.

Future research must employ more rigorous study designs to prove the effectiveness of mandala creation as part of Shinrin - Yoku. Randomized controlled trials (RCTs) are considered the gold standard for determining causal relationships and should be used more frequently in this area of research. In an RCT, participants would be randomly assigned to different groups: one engaging in Shinrin - Yoku alone, another in mandala creation alone, a third group combining both therapies and a control group receiving no intervention. This design would allow for direct comparisons between groups and provide robust evidence of the additive or synergistic effects of combining mandala creation with forest therapy.

Additionally, standardized protocols are needed for both Shinrin - Yoku and mandala creation. There is significant variation in how these therapies are administered across studies, making it challenging to compare results and draw definitive conclusions. Standardized guidelines regarding the duration, frequency, and spe-

cific activities involved in both therapies would help ensure consistency and reproducibility across studies.

Future research must utilize valid and reliable outcome measures to demonstrate the efficacy of mandala creation as part of forest therapy. While self-report questionnaires on mood, anxiety, and well-being are valuable, they can be subject to bias. It is essential to include a combination of subjective and objective measures to strengthen the evidence. For example, physiological stress indicators, such as cortisol levels, blood pressure, and heart rate variability, can provide objective data on the body's response to the combined therapies. Mandalas have deep roots in spiritual and religious traditions, such as Buddhism and Hinduism, and their use in therapeutic contexts should be culturally sensitive. Exploring how cultural differences influence the interpretation and acceptance of mandala creation as therapy could enhance its global applicability and prevent cultural appropriation concerns.

Moreover, specific measurement tools that can capture the unique benefits of combining mandala creation with Shinrin - Yoku need to be developed and validated. This could involve adapting existing scales or creating new tools designed to assess factors such as creative flow, connectedness with nature, and the meditative aspects of mandala creation in natural settings.

Future research should also investigate the role of individual differences in response to combined therapies. The effectiveness of mandala creation within Shinrin - Yoku may likely vary depending on factors such as personality traits, prior experience with art or nature, baseline levels of anxiety or depression, and cultural background. Understanding these nuances could help to tailor interventions more effectively and maximize their therapeutic potential for different individuals.

For example, researchers could explore whether individuals with high levels of openness to experience, a personality trait associated with creativity and appreciation for nature, experience more significant benefits from combined therapy. Similarly, studies could examine whether people with different baseline levels of mental well-being respond differently to the intervention. Personalized approaches could be developed by identifying which therapy components are most beneficial for specific subgroups.

Finally, to prove the efficacy of mandala creation as part of forest therapy, future research should focus on its practical applications and integration into healthcare settings. This involves exploring how these combined

therapies can be implemented in various contexts, such as clinical settings, community health programs, schools, and workplaces. Pilot studies and implementation research can help to identify the best practices for delivering these interventions, including cost-effectiveness, feasibility, and scalability.

Additionally, collaborations with healthcare providers, such as psychologists, art therapists, and ecotherapists, could help to establish Shinrin – Yoku combined with mandala creation as a recognized therapeutic modality. Developing training programs and certification standards for practitioners could further ensure the quality and consistency of the interventions.

Conclusion

Forest therapy, a concept extensively analyzed by the esteemed scholar Eduardo Kohn, accentuates the profound notion of a “thinking forest,” within which human beings are allowed to cultivate an ecological understanding of their ethical frameworks by deeply comprehending the intricate web of interconnectedness that binds all living entities together in a complex ecosystem. This methodology actively promotes a heightened appreciation for the forest environment’s aesthetic beauty and cognitive dimensions, ultimately serving as a guiding compass for ethical living and informed decision-making processes, as highlighted in Kohn’s significant work published in 2022 (Kohn, 2022).

Incorporating mandala-making into Shinrin - Yoku enhances the therapeutic benefits by fostering mindfulness, deepening the connection to nature, providing a means of creative expression, and facilitating emotional release and personal reflection. It is a simple yet profound way to engage with nature on a deeper level, promoting holistic well-being.

Incorporating mandalas within this therapeutic milieu can significantly enhance the overall therapeutic experience by offering a visual and meditative instrument that mirrors the inherent interconnectedness and delicate balance prevalent in the natural world and fosters a harmonious relationship between individuals and their surroundings. This integration resonates harmoniously with the foundational principles of ecological

ethics, thereby promoting a state of mindfulness and facilitating a more profound comprehension of one’s existential role within the broader context of the natural environment, as discussed by Gama and colleagues in their comprehensive study of 2024. (Gama et al. 2024). The act of creating mandalas in a serene forest environment can serve to amplify one’s mindfulness and reflective capabilities. Moreover, the creative process involved in the construction of mandalas can significantly aid individuals in forging a deeper connection with their inner selves while simultaneously fostering a greater awareness of the more extensive ecological system, ultimately encouraging a sense of wholeness and equilibrium, as articulated by Vidović and Rupčić in their pivotal research published in 2019. (Vidović & Rupčić 2019).

The empirical evidence that substantiates the health and healing advantages associated with the practice of creating mandalas is rooted in their remarkable ability to facilitate mindfulness and enhance psychological well-being among individuals engaged in such activities.

While the integration of mandalas into the framework of Shinrin - Yoku unveils many promising opportunities for therapeutic advancement, it is paramount to acknowledge the necessity for meticulously structured and scientifically validated interventions that underpin such practices. The overall effectiveness of these integrative therapeutic modalities would be significantly augmented by implementing rigorous research methodologies to establish evidence-based practices within this domain. Furthermore, it is crucial to recognize that although Shinrin - Yoku and the practice of creating mandalas each provide substantial individual benefits, the synergistic effects of their combined application warrant further investigative efforts to thoroughly comprehend both the full spectrum of potential advantages and any conceivable limitations inherent to this integrative approach.

The scientific evidence supporting the health and healing benefits of creating mandalas lies in their ability to promote mindfulness and psychological well-being. While integrating mandalas into Shinrin - Yoku presents promising opportunities, it is essential to consider the need for structured and scientifically validated interventions. Rigorous research to establish evidence-based practices would benefit the effectiveness of such integrative therapies.

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UNAPRJEĐENJE MENTALNOG ZDRAVLJA I DOBROBITI KROZ INTEGRACIJU IZRADE MANDALA I METODE *SHINRIN-YOKU*: SINERGIJSKI PRISTUP

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Sažetak

Izrada mandala i *Shinrin-yoku* (hrv. šumska kupka) prepoznati su po svojim sposobnostima smanjenja stresa. Integracija ovih praksi mogla bi potencijalno pojačati terapijske učinke metode *Shinrin-yoku*. Kombiniranje izrade mandala s metodom *Shinrin-yoku* može pojačati blagotvorne učinke smanjenja stresa. Meditativni aspekti izrade mandala mogu povećati svjesnost i opuštanje tijekom prakse *Shinrin-yoku*, što potencijalno može dovesti do učinkovitijeg smanjenja stresa i poboljšanja emocionalnog blagostanja poticanjem dublje povezanosti s prirodom.

Ovaj rad ima za cilj istražiti specifične učinke uvođenja stvaranja mandala u okruženje *Shinrin-yoku* na mentalno blagostanje.

Središnja je hipoteza da bi integracija ovih terapija mogla biti posebno korisna u strukturiranim programima u kojima sudionici sudjeluju u izradi mandala u prirodnom šumskom okruženju, iskorištavajući umirujuće učinke umjetnosti i prirode.

Shinrin-yoku jet praksa s dubokim kulturnim korijenima i znatnim zdravstvenim blagodatima koja je prepoznata te iz Japana preslikana i na ostatak svijeta, čime je postala globalni fenomen u području *wellnessa*. *Shinrin-yoku* koristi umirujuće učinke prirode za smanjenje stresa na psihološkoj i fiziološkoj razini. Opsežna istraživanja, uključujući sustavne preglede i metaanalize,

pokazala su da *Shinrin-yoku* znatno snižava krvni tlak i razine kortizola u slini, što rezultira smanjenjem stresa među urbanim stanovnicima. Štoviše, potvrđeno je da redovita praksa *Shinrin-yoku* poboljšava emocionalna stanja i potiče vitalan osjećaj povezanosti s prirodom, što je ključno za učinkovito upravljanje stresom. Osim toga, šumsko kupanje dosljedno poboljšava raspoloženje, smanjujući napetost, depresiju i ljutnju.

Mandale, koje su simbolički prikazi svemira, stoljećima se primjenjuju u vjerskim i terapijskim kontekstima za promicanje svjesnosti, samosvijesti i emocionalnog ozdravljenja. Izrada mandala i terapija bojenja (ranije dizajniranih) mandala (MCT) kreativni su procesi koji potiču svjesnost i samoizražavanje, znatno smanjujući stres i poboljšavajući emocionalno blagostanje. Izrada mandala može uključivati odabir prirodnih materijala iz šume za dizajniranje personalizirane mandale ili tijekom MCT-a, odabir dizajna mandale i materijala za bojenje, uz vodstvo voditelja koji sudionike čini usredotočenima i pobuđuje u njima neosuđivački stav. Empirijske su studije pokazale da izrada mandala može učinkovito smanjiti razinu stresa, anksioznosti i depresije.

Terapijski pristup koji kombinira meditativne i kreativne aspekte umjetnosti mandale s terapijskim učincima prirodnih okruženja, posebice šuma, nudi holistički način poboljšanja psihološkog zdravlja. Dok izrada mandala (uključujući bojenje mandala) i *Shinrin-yoku* neovisno jedno o drugom nude jedinstvene prednosti za smanjenje stresa, njihova integracija pruža holističkiji pristup upravljanju stresom. Ova kombinacija koristi meditativne i kreativne aspekte izrade mandala uz restorativnu snagu prirode, što dovodi do poboljšanih terapijskih rezultata.

Kako bi se u potpunosti razumio i optimizirao ovaj integrativni pristup, daljnja istraživanja trebala bi se usmjeriti na potencijalne sinergijske koristi i najbolje načine za integraciju ovih terapija u različitim okruženjima i populacijama. Također je važno uzeti u obzir individualne preferencije i kulturne kontekste pri dizajniranju integriranih terapijskih programa.

Ključne riječi: KAM, *mindfulness*, relaksacijska terapija, *Shinrin-yoku*, mandala