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REVIEW

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The Impact of Outdoor in Nature Mindfulness on the Mental Well-being of Children and Adolescents. A Mental Health and Cross-cultural Approach

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ABSTRACT

Background: Mindfulness, originating from ancient meditation practices, has garnered substantial scientific interest in recent decades due to its potential to enhance various aspects of well-being. The rise of scientific interest in mindfulness has led to the development of Mindfulness-Based Stress Reduction (MBSR) and other mindfulness-based interventions (MBIs), which have demonstrated positive effects on stress reduction, emotional regulation, and cognitive flexibility. **Objective:** This study aimed to explore the characteristics and applications of mindfulness, investigate its impact on mental health, and assess the potential benefits of combining mindfulness with nature-based interventions in promoting the well-being of children and adolescents. **Methods:** This review draws from existing literature, scholarly articles, and empirical studies related to mindfulness, nature exposure, and their effects on mental health. **Results:** The results highlight the manifold benefits of mindfulness in different populations, including health professionals, patients, children, adolescents, and the general public. Mindfulness practice has been associated with notable reductions in stress, anxiety, and depression, and has shown positive effects on brain plasticity and cognitive functioning. Furthermore, the integration of mindfulness with exposure to natural environments holds

potential for enhanced stress reduction and cognitive restoration. **Conclusion:** The findings underscore the potential of mindfulness as a cost-effective and accessible intervention to promote mental health across diverse age groups and settings. Further research should explore the specific mechanisms and long-term effects of this integrated approach to optimize its benefits. **Keywords:** Mindfulness, nature-based interventions, mental well-being, children, adolescents, Mindfulness-Based Stress Reduction (MBSR), mindfulness-based interventions (MBIs).

1. BACKGROUND

Mindfulness-based interventions (MBIs) include the application of meditation as well as mind-body practices to promote conscious awareness in everyday life. The aim is to help individuals cope with everyday stressors, adversities, adverse life events, and unpleasant situations through disengagement and positive and negative emotional regulation. Mindfulness application can be seen as a process measure for describing and quantifying how people actively apply mindfulness practice to their life experiences (1). Mindfulness is a science-based practice that involves paying non-judgmental attention to the present moment. It is also associated with the cultivation

of positive emotions such as empathy, compassion, and kindness (2).

Mindfulness programs have been implemented in various settings such as schools, universities, institutions, and companies to improve thinking skills (3). They are also targeted towards health professionals (4), patients and caregivers, children, adolescents, the elderly (5), individuals struggling with substance use (5, 6) and can be practiced at home, school, or in any work environment (7). In conclusion, these programs are inclusive and can be discreetly applied anywhere and at any time (8).

Mindfulness training and teaching can be conducted by specially trained individuals in the technique (9) as well as through web and smartphone applications that offer guided meditations. These applications are easily accessible, efficient, and cost-effective (3, 10, 11).

2. SPECIAL CHARACTERISTICS OF THE MINDFULNESS TECHNIQUE AND ITS PRACTICAL APPLICATIONS

Conscious awareness is characterized by several key elements. Firstly, mindfulness involves purposeful action in the form of intentionally directing attention. Secondly, it embodies presence, encouraging individuals to fully engage with and pay attention to the present moment. Lastly, an essential aspect of mindfulness is acceptance, which entails being non-judgmental about whatever arises in the moment. This includes observing thoughts, feelings, and sensations without categorizing them as good or bad, positive or negative, pleasant or unpleasant. Instead, the mindful individual acknowledges these aspects as they are, recognizing that they will eventually pass (8). Through experiential exercises and practices, participants learn how to retreat or disengage from their initial negative thoughts and increase their cognitive flexibility (10). At a professional level, mindfulness programs can be implemented in the workplace to help employees, including health professionals, effectively cope with stressful situations and promote their overall well-being (12, 13). The mechanisms involved in these programs include awareness/self-regulation, self-care, growth mindset, goal achievement, and acceptance/compassion. A supportive environment is crucial for their effectiveness (14).

Interventions can be implemented at the individual level (i.e., personalized), group level, and organizational level. At the individual level, using a mindfulness meditation app can help establish a meditation routine. For example, one can integrate their daily meditation practice into their existing routine, such as an evening walk, to establish a consistent practice. Personalization is an important aspect of many health interventions, as research has shown (11).

At the group level, face-to-face contact is emphasized, as it has the highest level of evidence for effectiveness. During group discussions, participants can share their personal experiences, challenges, and successes in practicing mindfulness (10). At the organizational level, the implementation of mindfulness can contribute to creating a safer work environment, increasing staff sat-

isfaction, and improving relationships between leadership and staff by managing workloads more effectively. The transformation of any activity into a mindfulness practice is contingent upon the incorporation of specific elements. To begin with, the activity should involve the direct engagement of one of the five senses. Focusing on a sense serves the purpose of anchoring the individual in the present moment and facilitating a separation from distracting thoughts. Additionally, an integral component of this mindful transformation is the inclusion of an "anchor." This anchor serves as the focal point of attention during the practice. Examples of such anchors could include the breath, the texture of a meal, the sound of running water, or any other sensory aspect that aids in cultivating mindfulness. The essence of the mindfulness technique lies in returning to the "anchor," maintaining focus on it before being distracted, and gently bringing the focus back to the anchor when distractions arise. Over time and with practice, the mind becomes less prone to being consumed by distractions (sensations or thoughts) and instead learns to observe them without judgment and let them go. (8) The primary mindfulness practices include breathing and walking meditation (formal practices involving relaxation and concentration exercises) and non-judgmental attention to daily activities (informal practice) (15).

3. EFFECTS OF THE MINDFULNESS TECHNIQUE ON MENTAL HEALTH

Mindfulness is a mind-body practice that has been found to have a beneficial impact on both psychological and physical well-being. It involves self-regulation of attention and adopting a specific orientation towards one's present-moment experiences (Portella et al., 2021). The mindfulness technique has a history of over 25 centuries, and in the last two decades, there has been a significant increase in interest among researchers to scientifically and systematically study its effects in various domains of life (16).

Davis and Hayes, (9) backed by data from the American Psychological Association (APA), proposed that the mindfulness technique yields effects across physical, psychological, and spiritual dimensions.

Psychologically, mindfulness has been observed to have a range of positive effects, as highlighted by research. This includes the reduction of stress and negative emotions, offering individuals a means to gain increased control over ruminative thinking—characterized by intrusive and repetitive negative thought patterns. Furthermore, engagement in mindfulness practices has been associated with notable psychological benefits, such as an increase in empathy, conscientiousness, and compassion. It has been found to improve mental focus and flexibility while enhancing overall awareness of the mind.

Studies examining the impact of mindfulness on academic education have identified both short-term and long-term memory enhancement as a noteworthy psychological outcome. Additionally, mindfulness has been linked to a reduction in distracting thoughts and a

decrease in emotional reactivity, contributing to a more balanced and resilient psychological state.

Within the spiritual domain, the practice of mindfulness has been associated with various positive outcomes. Research suggests an augmentation of empathy and compassion, reflecting an enhanced capacity for understanding and connecting with others on a deeper level.

Furthermore, individuals engaging in mindfulness have reported an increase in discipline, cultivating a sense of self-control and purpose. The spiritual benefits extend to an elevation in the sense of intuition, morality, and courage, fostering a more profound connection with one's inner values and convictions. Mindfulness practices have also been linked to an increase in self-awareness and self-acceptance, promoting a more profound understanding and acknowledgment of one's own thoughts and emotions. This, in turn, contributes to a greater sense of acceptance toward others. Moreover, mindfulness has been associated with an increase in the control of automatic behaviors, allowing individuals to navigate situations with greater spontaneity while maintaining a conscious awareness of their actions in alignment with spiritual values (17).

Mindfulness practice has been identified as a multifaceted approach contributing to several positive outcomes. Primarily, it has demonstrated effectiveness in reducing stress and depression, potentially leading to a diminished reliance on corresponding medications for mental health management.

In addition to its impact on mental well-being, mindfulness has been associated with an increased ability to tolerate pain or disability and a reduction in pain perception. This suggests potential applications in pain management and coping with physical challenges.

Mindfulness practices also extend their influence to interpersonal relationships, promoting improved dynamics and communication between individuals. Furthermore, they have been found to enhance the overall effectiveness of medical treatments, fostering a reflective approach to the treatment process (18).

Additionally, engaging in mindfulness has been linked to an increased motivation for making positive lifestyle changes. This includes adjustments related to diet, smoking, physical activity, and substance abuse, suggesting a comprehensive impact on various aspects of well-being.

Moreover, the benefits of mindfulness extend to physiological functions, as evidenced by improvements in endocrine function, including the reduction of cortisol levels in the blood. Furthermore, mindfulness has been associated with positive effects on immune and nervous system function, emphasizing its potential role in promoting holistic health.

Mindfulness-based stress reduction programs can serve as effective tools to reduce stress, increase resilience, lower heart rate and blood pressure, enhance job satisfaction, promote calmness, strengthen self-compassion, and foster inner peace among participants (19). Effective interventions not only improve participants' health-related quality of life but also enhance the quality of working life for healthcare professionals. Further-

more, mindfulness practice contributes to better time management, resulting in immediate improvements in performance and productivity in the workplace. Moreover, mindfulness practices foster psychological safety in the workplace. Participants strengthen their ability to express themselves without fear of negative consequences for their self-image, situation, or career. This creates a psychologically safe working environment where employees can freely express their thoughts, care for one another, and feel safe to experiment and take risks (20).

Mindfulness practice has also shown positive results in improving cognitive abilities such as cognitive flexibility and memory in healthy individuals. It has been associated with structural and functional differences in various brain regions. These include the prefrontal cortex, which is related to enhanced metaconsciousness and reappraisal; the sensory cortices and insula, which are related to body awareness; the hippocampus, which is related to memory and refocusing; and the cingulate cortex, which is related to self-regulation and emotion regulation (21).

In terms of interpersonal benefits, mindfulness is associated with higher relationship satisfaction, the ability to respond constructively to relationship stress and conflict, improved emotional recognition and communication with partners, reduced negativity, and increased empathy (5). Individuals with higher levels of mindfulness report less emotional stress and anger in response to relationship conflict. Intrapersonal benefits of practicing mindfulness include enhancing self-awareness, ethical decision-making, intuition, and fear conditioning. Mindfulness also improves information processing speed, reduces work effort, and reduces work-related irrelevant thoughts (19).

4. MINDFULNESS IN NATURE

Nature-based interventions, including spending time in green spaces, have been associated with various positive outcomes, such as reduced stress, increased positive affect, and improved cognitive functioning (20). Moreover, research has suggested that exposure to natural environments can enhance the experience of mindfulness, leading to increased attentional capacity, emotional regulation, and self-awareness (22). Therefore, the integration of mindfulness and nature-based interventions seems to be a promising approach to promote well-being and prevent mental health problems.

Theories of Attention Restoration and Stress Reduction have been proposed to explain the positive effects of nature exposure on well-being. (3) Attention Restoration Theory (ART) posits that exposure to natural environments can restore attentional capacity, which is depleted by the demands of daily life and the need for directed attention. According to ART, natural environments possess characteristics such as soft fascination, being away, extent, and compatibility, which promote the restoration of attention. On the other hand, the Stress Reduction Theory (SRT) suggests that exposure to natural environments can evoke positive emotional responses, leading to a reduction in physiological arousal and stress levels (17).

5. CONCLUSION

The findings underscore the potential of mindfulness as a cost-effective and accessible intervention to promote mental health across diverse age groups and settings. Further research should explore the specific mechanisms and long-term effects of this integrated approach to optimize its benefits.

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