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Mindfulness Meditation: A Hellenic Perspective Through Quantitative and Qualitative Study

Michael. D. Callifronas [a*] and Aikaterini Kaltsouni [a]

[a] The Hellenic Institute for Psychotherapy, 33, Solomou St., 10682 Athens, Greece.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Mindfulness facilitates accepting with kindness and non-judgmentally the reality of the present moment and acknowledge the pleasant or unpleasant feelings caused by the present situation or by automatic negative thoughts. Continued practice cultivates awareness, willingness, and a positive outlook on stressful events, thereby helping to fully experience moments with greater insight and wisdom while leading to a greater sense of Meaning in Life and a greater sense of control. We present and discuss our quantitative and qualitative study of an 8-session mindfulness workshop, which was organised to study the compatibility and impact of mindfulness meditation on Greek participants and their cultural and social context. It we conducted in two groups with different durations. One group had sessions every week, and a second group met fortnightly. The design was quasi-experimental. Results showed overall significant baseline differences with medium to large effect sizes across three of the five facets of the FFMQ and the General Mindfulness Questionnaire. Furthermore, the fortnightly group showed clearly better results than the weekly

**Corresponding author: E-mail: michael@callifronas.com;*

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group with larger effect sizes and higher significance differences. Potential effects of the workshop on members' behavior and well-being are discussed both qualitatively and quantitatively. The results showed overall satisfactory medium to large effect sizes and significant differences in three facets, 'non-react', 'observe' and 'non-judge' and the fortnightly session group clearly showed better outcomes than the weekly sessions group.

Keywords: Mindfulness; meditation; FFMQ; awareness; acceptance; patience; letting go; forgiveness; mental clinical conditions; pain; physical clinical conditions; QOL; Focusing.

1. INTRODUCTION

1.1 The Definition

According to Kabat-Zinn (2017) Mindfulness is a mental state characterized by "the awareness that arises from paying attention, on purpose, in the present moment and non-judgmentally" The practice of Mindfulness enhances the human skill to acknowledge the reality of the present moment with kindness to one's self. It helps to accept reality and fully welcome it, whether it's about pleasant emotions like joy or relief or happiness, or unpleasant feelings caused by automatic negative thoughts (ANT), activating "negative" feelings (Kabat-Zinn, 1990). Such feelings are frustration, anger, insecurity and fear, stress and anxiety or even feelings of worthlessness.

Mindfulness meditation is somehow different from some other forms of meditation practice and works by focusing on sensations and distracting thoughts rather than paying attention to a phrase or "mantra" in order to ignore distracting thoughts and discomfort (Wane, et al., 2021, Tshering, 2021).

Mindfulness training offers the opportunity to cultivate awareness, increased willingness and positive outlook on stressful events and "threats". Continuous practice helps to fully experience the moments with greater insight and wisdom that lead to a better sense of meaning in life and a greater sense of control, which makes it easier to take decisions for change.

1.2 A Presentation of the Mindful Qualities

Acceptance relieves us of the deep mental pain often caused by the arrow of blame, "the second arrow" as the Buddha says (Alidina, 2010). Through acceptance we can try to acknowledge the painful sensation, without the direct intention of turning it into a positive feeling. Once the experience is accepted as it is, breathing into this difficult sensation can help to approach it and soften it slowly, reducing the intensity.

To achieve the desired level of personal acceptance and overcome negative thoughts and difficult feelings that arise before, during or after meditation practice requires patience. The more the practice of meditation is cultivated, the more effective the mindful way of thinking, feeling and acting becomes. Impatience can be

cured through a sense of mindful curiosity about the origin, nature and emotional impact of emerging thoughts, ideas and observations during meditation. Healthy curiosity can donate to each of us the mindful look of a child, allowing us to observe afresh and with a beginner's mind the wonderful little things that happen around us in every moment of our lives (Alidina, 2010; Carmody & Baer, 2007; Carmody, et al. 2009; Kabat- Zinn, 1990),

In our view, there is a close connection between the mindful attitudes of Kindness, Letting go and Forgiveness. Letting go is a meditation practice that gives a new way, a different perspective to see the events of life and slowly cultivates forgiveness. Forgiveness in turn is the essence of letting go from our mind, freeing our mind from a negative thought, a minor or major issue that bothers us. Kindness embraces both attitudes, as being deeply kind also means forgiving and overcoming small annoying things in our daily lives. Kindness and Compassion are also the way to be loved and love yourself. "Si vis amari, ama" (if you want to be loved, give love) writes Seneca the Roman philosopher (62 AD). Therefore, it is very important to speak with a soft voice even to unkind people, to apologize and offer, even if it is something small, a meaningful "nothing", to feel fulfilled, to be Kindful with a capital "K" (Alidina, 2010; Carmody& Baer, 2007; Kabat-Zinn, 1990)!

Biochemically, the good feeling we get with kindness is thought to be due to elevated levels of the brain's natural versions of morphine and

heroin, which we know as endogenous opioids. These cause elevated levels of dopamine in the brain and so we get a natural high, often referred to as a "Helper's High". Kindness also triggers the release of the hormone oxytocin, which reduces the blood pressure by keeping arteries open. In addition, oxytocin reduces heart rate, increases relaxation, protects against inflammation and slows aging (Hamilton, 2017).

1.3 In Physical and Mental pain

Research consistently demonstrates that chronic pain often co-occurs with opioid misuse, emphasizing the need for integrated treatment approaches. Vowles et al. (2019) investigated a program that helped individuals recognize and modify their habitual responses to pain, accept discomfort, and engage in valued activities. This approach led to significant reductions in opioid misuse, pain interference, and pain-related behaviors, supporting the feasibility and efficacy of integrated pain management strategies.

Similarly, Garland et al. (2019) explored the Mindfulness-Oriented Recovery Enhancement (MORE) intervention. This program not only reduced pain severity and opioid misuse risk but also significantly improved participants' positive psychological health. [2] Importantly, the study found that improved mental well-being directly contributed to reduced pain severity, which in turn decreased the risk of opioid misuse. These findings highlight the crucial role of mindfulness and positive psychological factors, such as enhanced positive affect, savoring, finding meaning in life, and a broader perspective, in preventing opioid misuse among people with chronic pain.

Emerging research provides a deeper understanding of the physiological and neural mechanisms underlying the pain-relieving effects of the MBIs. Adler-Neal et al., (2020) found that increased parasympathetic tone, measured as high-frequency heart rate variability (HF-HRV), is associated with reduced affective pain. This suggests that mindfulness practices enhance vagal activity and heart rate variability, offering potential pain relief through parasympathetic modulation. Neural mechanisms involving the prefrontal cortex, perigenual anterior cingulate cortex, thalamic activity, and non-opioid systems were identified as critical pathways.

Hunt et al., (2023) further explored the role of Mindfulness Based Interventions (MBIs) in pain management. The study found that MBIs may enhance motivation and meditation engagement through the mesocorticolimbic system. While daily meditation positively influenced pain-related thoughts, it did not significantly impact clinical pain. Interestingly, mindfulness appeared to influence the impact of headaches but not their frequency, emphasizing the nuanced effects of MBIs on pain.

Despite promising findings, the evidence for mindfulness-based stress reduction (MBSR) in certain pain conditions remains mixed. Prochaska and Matthias (2023) reviewed four randomized controlled trials (RCTs) involving 275 participants with migraines. While MBSR significantly improved depressive symptoms, it did not show a significant effect on migraine frequency, and headache severity was not assessed. The study concluded that evidence is insufficient to recommend MBSR as a standard treatment for migraines, highlighting the need for further high-quality research. (More research results are discussed in paragraph 5.1).

A common response to our emotional or physical pain is to block it out or “brush it under the rug” and deny that feeling by (over) eating, drinking alcohol, taking medicine or even drugs. Another response would be to be overwhelmed, to crush and be swept away or drawn by the pain without having the mental and emotional resources to deal with it. It is obvious that both ways of dealing with the situation, although some of them seem to work immediately, have multiple side effects in the long run, such as repeated failures, generalized anxiety or depression, etc. (Palmer, 2018).

A mindful way to deal with both types of pain is to turn to that difficult feeling or emotion and fully accept its existence by perceiving the experience and acknowledging it without good or bad judgment (Palmer, 2018).

1.4 Mindfulness and Quality of Life

A growing body of research explores the relationship between mindfulness and various aspects of well-being, particularly among university students. Studies employing diverse methodologies, from cross-sectional surveys to meta-analyses, consistently point to the positive impact of mindfulness on mental health, academic performance, and overall quality of life (QOL) emphasizing its mechanisms and implications.

Grossman et al. (2010) reported that Mindfulness-Based Interventions (MBI) significantly improve health-related quality of life (HRQOL) and overall well-being in individuals with multiple sclerosis (MS) for at least eight months. Moreover patients highly appreciated the program.

Alomari (2023), in a study of 489 public university students, identified moderate levels of mindfulness across all measured domains. Notably, no significant gender differences were observed, but students with higher academic achievement demonstrated greater mindfulness. These findings suggest a potential link between mindfulness and academic success, indicating that mindfulness practices might indirectly support better academic performance.

Meta-analytic reviews provide a broader perspective on the effects of mindfulness. Mattes (2019), in a comprehensive meta-analysis of 117 studies, highlighted the critical role of non-judgment in clinical mindfulness interventions. The ability to observe experiences without judgment emerged as a key factor supporting positive outcomes and enhancing intervention effectiveness. Mattes concluded that mindfulness bridges existential concerns and therapeutic approaches by emphasizing acceptance. Further meta-analytic evidence reinforces the therapeutic benefits of mindfulness. Zuo et al. (2023), analyzing 11 studies, demonstrated that mindfulness therapy effectively reduces depression, anxiety, and stress while improving sleep quality in student populations. However, the analysis also suggested a limited impact on overall mindfulness scores. In addition Benavides-Gil et al. (2024) conducted a metanalysis review with healthcare professionals during the COVID-19 pandemic and found that Mindfulness-Based Interventions (MBIs) effectively reduced stress and improved mindfulness and mental well-being. Furthermore, De Vibe et al. (2012) argued in their metanalysis that MBSR training showed a clear improvement on measures of personal development, sense of coherence distress and mental health.

Similarly, Pan et al. (2024) conducted a meta-analysis showing the positive impact of mindfulness-based psychological interventions, such as Mindfulness-Based Stress Reduction (MBSR), on university students' psychological and behavioral health. These interventions were found to alleviate negative emotions like anxiety, depression, and stress, while simultaneously boosting self-confidence. The rigor of this study was enhanced by the blinding of participants, personnel, and outcome assessors.

Mindfulness enhances quality of life (QOL) through distinct cognitive and emotional pathways. Li et al. (2022) demonstrated that core self-evaluation mediates the relationship between mindfulness and life satisfaction via two routes: one leading to improved well-being through "core self-evaluation → positive affect" and another reducing distress through "core self-evaluation → negative affect." These pathways underscore the interplay of self-perception and emotion regulation in fostering life satisfaction. Guided by the Mindfulness-to-Meaning theory, the findings highlight the importance of mindfulness interventions that strengthen core self-evaluation, amplify positive emotions, and mitigate negative ones, offering practical strategies for enhancing QOL and mental well-being.

In summary, research consistently demonstrates the positive influence of mindfulness on various aspects of student well-being, including academic performance, mental health, and life satisfaction. Interventions such as MBSR and other structured mindfulness programs can play a pivotal role in improving QOL among university students by reducing negative emotions, enhancing resilience, and fostering life satisfaction.

The integration of mindfulness practices into educational and therapeutic settings offers a promising avenue for enhancing QOL. By addressing both cognitive and emotional dimensions of well-being, mindfulness-based interventions can equip students with the tools to navigate academic challenges and life stressors effectively. The growing evidence base underscores the value of mindfulness as a holistic approach to improving QOL, making it a vital component of student support systems.

1.5 In Physical Clinical Conditions

1.5.1 In cancer patients

The research collectively underscores the profound potential of mindfulness interventions in transforming the cancer experience for both patients and their caregivers. These interventions offer a multifaceted approach to addressing psychological distress, fostering emotional

regulation, and enhancing overall quality of life (QoL). While the specific outcomes and methodologies of these studies vary, several key themes consistently emerge, illuminating both the strengths and areas requiring further development within mindfulness-based approaches to cancer care.

One consistent finding across these studies is the significant efficacy of mindfulness in alleviating negative psychological states. Anxiety, depression, and overall psychological distress were notably reduced among cancer patients who engaged in mindfulness practices, as evidenced by the research of Tian et al. (2022) and Li et al. (2024). This suggests that mindfulness cultivates emotional resilience in individuals facing the challenges of cancer. Furthermore, Tian et al.'s meta-analysis highlighted a significant enhancement of positive psychological traits, including self-efficacy and mind-body awareness, among patients. This improved self-awareness empowered patients to more effectively manage their condition and actively engage in their daily lives. These findings align with Li et al.'s systematic review, which identified emotional regulation as a crucial mediator in improving overall patient well-being.

Beyond psychological benefits, mindfulness demonstrated a positive impact on sleep quality and fatigue alleviation, as highlighted by Tian et al. These findings are particularly significant given the high prevalence of sleep disturbances and exhaustion among cancer patients, which can significantly exacerbate both physical and psychological struggles. By addressing these critical issues, mindfulness emerges as a holistic intervention that not only improves psychological health but also contributes to enhanced physical recovery and overall QoL.

Mosher et al. (2024) significantly expanded the scope of mindfulness research by investigating its application within the context of patient-caregiver dyads coping with advanced cancer. Their study, focusing on the MEANING program, revealed that mindfulness interventions can effectively improve existential well-being and enhance self-efficacy for advance care planning among patients. While some outcomes, such as depressive symptoms, caregiver burden, and readiness for advance care planning, did not reach statistical significance, the study observed moderate gains in psychological well-being and caregiver QoL.

While Tian et al. reported limited statistical differences in overall QoL between mindfulness interventions and usual care, subgroup analyses revealed significant improvements in specific QoL dimensions. Similarly, Mosher et al. observed moderate gains in caregiver QoL. These findings suggest that the impact of mindfulness on QoL may be more nuanced than initially captured by broad, aggregate metrics. This necessitates the development of more refined QoL measures to fully understand the broader implications of mindfulness-based interventions in cancer care. Moreover

The findings also emphasize the critical need for tailoring mindfulness programs to the specific needs of different patient populations. Mosher et al. demonstrated the unique benefits of mindfulness in the context of advance care planning, a crucial yet often overlooked aspect of cancer care. By customizing interventions to address the distinct psychological and relational needs of individual patients and their caregivers, researchers and clinicians can significantly enhance the efficacy and broaden the appeal of mindfulness-based approaches within cancer care.

1.5.2 In other clinical conditions

Mindfulness-Based Stress Reduction (MBSR) has been explored as a therapeutic intervention for various clinical conditions, including Irritable Bowel Syndrome (IBS), fibromyalgia, type 2 diabetes, and HIV. Each of these conditions presents unique challenges, but research suggests that MBSR may offer meaningful benefits across these diverse populations. Zernicke et al. (2013) conducted a randomized clinical trial (RCT) to evaluate the impact of MBSR on IBS symptoms. Participants in the MBSR group experienced greater reductions in symptom severity and stress compared to the control group, with clinically meaningful improvements sustained at six months. Both groups reported enhanced mood, quality of life, and spirituality, highlighting MBSR’s broader positive effects.

For fibromyalgia, Schmidt et al. (2011) investigated the efficacy of MBSR in an RCT involving 177 patients. The study demonstrated significant improvements in health-related quality of life (HRQoL) two months post-treatment ($P = 0.004$). Post hoc analyses revealed significant pre-to-post-intervention HRQoL benefits, with six out of eight variables showing improvement ($P = 0.02$). These findings underscore MBSR’s

potential to alleviate some of the burdens associated with fibromyalgia.

In the context of type 2 diabetes, Hartmann et al. (2012) assessed the effects of MBSR on psychosocial and physical health outcomes. Over a year, participants showed reduced depression (d = 0.71), improved overall health status, and decreased stress (d = 0.64). Although no significant effects on albuminuria were observed, the study highlights MBSR's promise in addressing psychosocial distress and potentially mitigating diabetes-related complications, warranting further investigation over extended periods.

Duncan et al. (2012) explored the role of MBSR in managing side effects of antiretroviral therapy (ART) among people living with HIV. While the intervention did not significantly enhance medication adherence or overall mental health, it helped reduce distress associated with ART side effects. Participants who engaged in mindfulness practice reported increased feelings of personal control, potentially aiding side effect tolerance. These findings suggest that MBSR could serve as a valuable complementary approach when tailored to the specific needs of individuals with HIV.

Additionally, Creswell et al., (2019) emphasize the wide-ranging benefits of mindfulness interventions as demonstrated by randomized controlled trials (RCTs). These interventions have been shown to enhance pain management and alleviate stress-related conditions such as clinical colds, psoriasis, Irritable Bowel Syndrome (IBS), post-traumatic stress disorder (PTSD), diabetes, and HIV. Furthermore, they effectively reduce substance-use behaviors, including smoking, drug relapse, alcohol consumption, and opioid misuse. The underlying stress-buffering framework driving these benefits is supported by robust biobehavioral and neuroimaging evidence, further validating the therapeutic potential of mindfulness.

In addition, Hughes et al. (2013) designed an RCT with MBSR with prehypertensive participants and concluded that both systolic and diastolic blood pressure were significantly reduced also arguing that if this effect could be sustained, MBSR could be important for prevention.

Moreover Pbert et al. (2012) conducted an RCT using MBSR in patients with asthma and found significant improvements in quality of life and perceived stress twelve months after their intervention.

On the other hand Hearn and Cross (2020) conducted a meta-analysis on MBIs for spinal cord injuries and concluded that therapeutic results regarding depression showed improvement of the intervention but the efficacy on improving pain anxiety and QoL is less clear due to the lack on more studies

In summary, most MBIs demonstrate a versatile and beneficial role across various clinical conditions, addressing both physical and psychosocial dimensions of health.

1.6 In Mental Clinical Conditions

Mindfulness-based interventions (MBIs) have been consistently shown in clinical research to be effective in treating various psychological disorders, including anxiety, depression, and hostility.

Canby et al., (2021), studying 104 individuals with varying degrees of depression, discovered that social factors, such as the dynamics of the instructor and the group, significantly influenced MBI outcomes. These social aspects were even stronger predictors of improvement in depression, stress, and mindfulness than the mindfulness practices themselves, highlighting the significance of the therapeutic relationship and the social environment of the intervention.

The increasing availability and reach of MBIs have been facilitated by the development of online platforms. A meta-review by Gong et al., (2023) suggested that online MBIs effectively reduce depression, anxiety, stress, and improve mindfulness among university students. This is particularly relevant given the growing use of online learning and mental health resources. Gong et al. emphasize the expanding evidence supporting the potential of online MBIs to reach a wider audience and provide accessible mental health support.

Beyond addressing general distress, MBIs have also demonstrated promise in treating specific clinical issues. Xu et al. (2024) showed that Mindfulness-Based Cognitive Therapy (MBCT) can lessen psychosomatic distress in people with somatic symptom disorder. Their research indicated that MBCT works by reducing alexithymia (difficulty identifying and describing emotions), which subsequently enhances self-

compassion. Statistical analysis confirmed that improved self-compassion resulted from reduced alexithymia, revealing a possible mechanism through which MBCT has a therapeutic effect.

The benefits of mindfulness and Mindfulness-Based Stress Reduction (MBSR) and MBI in general extend to a wide range of clinical conditions. Numerous studies have documented their positive impact on conditions like anxiety disorders, stress disorders, sleep problems, menopausal hot flashes, and major depression (Andersen, et al., 2013; Benavides, et al, 2024;Carlson, et al., 2013; Carmody, et al., 2011; Chiesa & Serretti, 2011; Duncan, et al., 2012; Hartmann, et al., 2012, 2013; Hofmann, et al., 2010; Hoge, et al., 2011; Sullivan, et al., 2009). This substantial body of research further establishes MBIs as a valuable tool for addressing various mental and physical health challenges.

In conclusion, strong evidence supports the use of MBIs as a beneficial approach in treating various mental health conditions, and research continues to explore the mechanisms and contexts that contribute to their effectiveness.

1.7 Mindfulness and Focusing

Experiential therapies provide a safe environment and help develop skills to fulfill needs (Maslow, 1943), for our survival and development (Rogers, 1961, 1980). They help with proactive interventions to find ways to address internal resistance to grounding with the experience, which eventually helps clients become more accepting (Geller, 2004).

Focusing-oriented psychotherapy (Gendlin, 1978, 1996) focuses on how the body perceives the present moment and recognizes emerging bodily wisdom as a guide to important life decisions. According to Leijssen (1990: 228) Focusing therapy is not a technique or a skill, but a therapeutic position that helps to emerge and express the "not yet" explicit meaning and knowledge. It is a therapeutic approach that facilitates the processing and discovery of the implicit meanings and beliefs that lie at the heart of our felt senses.

On the other hand, mindfulness practice, helps to open up the painful bodily experience with care, with a sense of self-compassion and without any judgment (Kabat-Zinn, 1990, 1994). Mindfulness training begins as a directive stress management technique and evolves into a lifestyle (Hahn, 1976; Kabat-Zinn, 1994).

For those who find it difficult to do Focusing experiential therapy, Mindfulness can be helpful. In fact, when there are communication difficulties and/or situations of significant mental tension, the patient's/client's previous practice of Mindfulness meditation often helps the psychotherapeutic relationship (Geller, 2004). To be specific, Mindfulness helps to soften internal defenses in order to allow Focusing experiential psychotherapy to work with the symbolisation of experience.

In addition, a new approach called Mindful Focusing (Rome, 2018) places greater emphasis on the personal development of meditators, through further and deeper therapeutic processing of the meanings offered by the bodily sensations. Thus, these two contemplative methods, Focusing and Mindfulness can act as complements and form the basis of Mindful Focusing (Rome, 2018). As Rome argues, "Focusing practice helps one to recognize and engage buried emotions and unconscious misconceptions that may not surface during meditation practice" (2017).

1.8 On Mindfulness Research

Extensive clinical and laboratory research has been done in the field of Mindfulness during the past thirty five years. The number of papers published annually on Mindfulness subjects has increased from 1 paper in 1982 to 397 publications in 2011.

Stein et al., (2008) highlight mindfulness as a key emotional regulation strategy emphasizing affect labeling, which enhances emotional recognition, distancing, and control. It boosts prefrontal cortex activity, reduces amygdala responses, and strengthens medial prefrontal-insula connectivity, aiding stress management. Mindfulness also positively impacts physiological systems like the HPA axis and immune function while fostering neuroplasticity, including increased insular gray matter. Integrating neurobiological, genetic, and environmental insights, mindfulness demonstrates significant therapeutic potential for improving mental health and overall well-being.

Specifically Hölzel et al., (2011) suggest that Mindfulness practice is associated with neuroplastic changes in the anterior cingulate cortex, insula, temporoparietal junction, fronto-

limbic network as well as default function structures. Furthermore, Hölzel et al., (2009) found a link between changes in amygdala gray matter density and decreases in self-reported stress following stress-reduction training.

Pagnoni and Cekic (2007) compared non meditators with a group of Zen meditators and found that meditation practice had a “neuroprotective” effect on gray matter volume. In fact, while gray matter decreased with age in the non-meditators, it did not in the meditation group, thus protecting the meditators from some effects of aging. In addition, Vestergaard-Poulsen et al., (2009) compared brain MRI scans of meditators and non- meditators and showed that meditation causes gray matter to grow in the lower brainstem.

Creswell et al., (2016) delivered pivotal insights into how mindfulness meditation affects brain connectivity. They observed a significant enhancement in resting-state functional connectivity (rsFC) between the default mode network (DMN) and the dorsolateral prefrontal cortex (dlPFC), accompanied by reduced levels of interleukin-6 (IL-6), a critical inflammatory marker. These results suggested a neurobiological mechanism for mindfulness's anti-inflammatory effects and established foundational evidence for its brain-modulating potential, paving the way for future exploration.

Expanding on this, Melis et al., (2022) conducted an exhaustive systematic review, elucidating the broader implications of mindfulness-based interventions (MBIs) on functional brain connectivity. Their work highlighted significant alterations in neural networks vital for emotion regulation, such as the amygdala-frontoparietal network, alongside networks associated with attention and executive functioning. This study built upon Creswell et al.'s findings by showcasing mindfulness's extensive influence across multiple neural pathways, contributing to a more comprehensive understanding of its effects on brain functionality.

Sevinc et al., (2020) provided further evidence for mindfulness-induced neuroplasticity, demonstrating that mindfulness training modifies connectivity within the hippocampus, a crucial region for memory, particularly during fear memory retrieval. These changes were linked to reduced anxiety, offering a tangible connection between mindfulness-induced brain alterations and enhanced emotional regulation. This study underscored mindfulness's ability to create enduring neural changes that support emotional resilience and well-being.

Stein et al., (2008) identified "affect labeling"—the practice of using language to identify and describe emotions—as a fundamental aspect of mindfulness. This process enhances emotional recognition, fosters psychological distancing, and improves regulation, cultivating heightened self-awareness and emotional control. Their findings laid the psychological groundwork for understanding how mindfulness translates into measurable neural transformations.

Building on this conceptual framework, Joss et al., (2022) explored the effect of mindfulness on the amygdala, a brain region critical to emotional processing, in individuals with childhood maltreatment histories. Their study revealed that mindfulness practice is associated with changes in both the volume and functional dynamics of the amygdala. These findings demonstrated mindfulness’s potential to counteract the enduring effects of early life adversity, highlighting its role in promoting neuroplastic adaptations in emotional processing areas. This work provided robust empirical evidence linking mindfulness practices to improvements in emotional regulation through brain-based mechanisms.

Sarah Lazar et al., (2005) found that when we focus our attention on our breath, on a candle, on a word or on a spiritual ideal, there is an increase in the thickness of the prefrontal cortex. In the same study, the authors argue that the right anterior insula remains thicker, thus allowing for a higher degree of interoception despite aging. As is well known, interoception is the fundamental skill of fully perceiving the interior of our body, and the insula belongs to the critical pathway of this bodily function that allows us to experience our emotions and subtle sensations.

Sun et al., (2022) expanded the discussion by examining mindfulness's broader role in addressing the health challenges linked to early life adversities (ELA). Their research emphasized that mindfulness strengthens brain networks responsible for self-regulation, bolsters immune and inflammatory responses, impacts telomere biology, and triggers epigenetic changes. These findings extended the scope beyond immediate neural and emotional impacts, suggesting that mindfulness practices have profound implications for overall health and resilience. By influencing

interconnected biological and psychological systems, mindfulness offers a holistic approach to mitigating the long-term effects of ELA and fostering enduring well-being.

Namely, a study from Harvard on the epigenetic effect of meditators showed significant effects on gene expression. Specifically, 2209 human genes were activated in long-term meditators and 1561 genes were affected in short-term (eight-week program) meditators compared to non-meditators. In their conclusion the authors argue that meditation can have long-term physiological changes, also slowing the rate of aging (Dusek, et al., 2008)

1.9 Precautions

It is worth noting that the treatment of serious clinical conditions such as severe generalized anxiety disorder with panic disorder, or severe depression or even psychotic illnesses, is reserved for officially certified and registered psychotherapists and/or doctors who are trained in the practice of mindfulness and can choose an appropriate time to add this approach to each patient's treatment protocol. In terms of our experience, we have used meditation practice in clinical disorders and diseases such as panic disorder, obsessive compulsive disorder, depression, etc. with encouraging results.

2. MATERIALS AND METHODS

2.1 Participants

The group of meditators consisted of twentyfour members, twenty women and four men, living in Athens, Greece. The age of participants was 35 – 55 years old. In their large majority they were Level 7 (Master) or level 8 (PhD or MD) graduates. All but one had group experience having already participated in therapeutic groups (psychotherapy, anger management, self-esteem development) and/or parental skills groups for more than one years.

The group consisted of two subgroups according to the registration order of each member in the program: Subgroup A had weekly sessions and subgroup B worked with fortnightly sessions. The design was quasi-experimental. This mindfulness workshop was conducted to study the compatibility and impact of mindfulness meditation on Greek participants and their cultural and social context.

2.2 Evaluation Tools

The measurement of the effectiveness of the intervention was carried out with two quantitative quests.

The first is an assessment by self report and is called Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., (2006) that was developed on the basis of another measurement tool the Kentucky Inventory of Mindfulness Skills KIMS (Baer et al., 2004).

The second scale to measure mindfulness was developed by Duncan (2007) who conducted a clinical study examining parents' mindful relationship with their children.

2.1.1 The five facet mindfulness questionnaire (FFMQ)

Baer et al., (2006) suggested that five distinct aspects are represented in the currently available mindfulness questionnaire, four of which correspond to the four KIMS skills (Baer et al., 2006), e.g. Observing, Describing, Acting with Awareness and Non-Judging Experience, while adding Non-reactivity to Inner Experience as a fifth facet.

Hierarchical confirmatory factor analyzes (CFA), however, supported only four of the identified factors as components of an overall mindfulness construct, while the fifth (Observing) failed to fit the hierarchical model in the full CFA sample, although it fit the hierarchical model well in a subsample having some meditation experience (see also Baer, et al., 2008).

The FFMQ comprises 39 items and measures the five facets of Mindfulness:

Non reacting actually focuses on observing thoughts and sensations and also reduces emotional reactivity and avoidance behaviors (Kabat Zinn, 1982). Seven items.

Observing internal phenomena such as thoughts, body sensations as well as external stimuli such as images, sounds and smells (Dimidjian & Linehan, 2003b).
Eight items

Acting with awareness and undivided attention to the current activity and focusing on one thing in the present moment (Hanh, 1976). Eight items.

Describing with a wealth of words non judgementally and without conceptualization (Linehan, 1993b; Segal et al., 2012). Eight items.

Non judging the experience of the present moment, acknowledging the present phenomena and allowing them to be as they are, without labeling and without attempts to escape (Dimidjian & Linehan, 2003a, 2003b; Marlatt & Kristeller, 1999). Eight items.

The rating of the 39 statements is effectuated on a five- point Likert scale ranging from "1 = never or very rarely true" to "5 = very often or always true".

This inventory (FFMQ) is renown and widely used in bibliography during the last fifteen years in order to measure the above described qualities and characteristics of mindfulness. It is cited in more than 7000 (research articles. Moreover the inventory's KIMS version has been standardized in Greek language (Psarraki et al., 2021, 2022).

2.1.2 The Duncan's general questionnaire

The second measurement tool is a twelve-item self- administered general scale based on the work of Baer (2006) and assesses the intrapersonal conscientious characteristics of parents. As described by the author, the instrument measures intrapersonal nonjudging/openness, intrapersonal present-centred attention, and intrapersonal emotional awareness. This tool is short and easy to administer and can be found online (Duncan, 2007, p. 80).

2.3 A Description of the Session Process

Some elements of our program were "borrowed" from Palousemindfulness.com offering some free resources as well as from Alidina (2010, 2015). In addition, we have added videos, texts and meditations, which are used in our stress and mindfulness workshops.

Participants in the first group were offered each week a new meditation recording – often presented in a short and a long version in Greek for their daily meditation practice, as well as a large selection of readings, also in Greek. The same material and tools were offered to the second group which had fortnightly meetings.

Below, we provide a brief summary of each session, including some interesting member comments made during the session process, while maintaining the confidentiality of the sessions.

3. THE QUALITATIVE FACET OF THE STUDY

3.1 The Sessions

In every one of the eight sessions comprised in the program the process started with a discussion concerning the meditation data sheets (logs) and their impressions on their compliance to the program during the past week. Then some topics concerning their questions were commented by the facilitator
.
In each of the eight sessions included in the program, the procedure began with a discussion about the meditation data sheets (logs) and their adherence to the program in the past week. Then some topics related to their questions were commented by the facilitator.

Various texts, books and videos were then presented and discussed according to the needs and requests of the members. Finally, the group practiced the next week's meditation after a brief introduction about its purpose and meaning.

3.1.2 First session

During the experiential process of this welcome meeting members introduced themselves and shared their motivations for joining the program. After discussing some practical questions, they also signed a personal contract with themselves, stating what they expected from the course, when they would do their meditations, etc.

Practice during the session included: a) The Raisin Meditation with a choice of black and blonde raisins, crisps, nuts or popcorn. Each participant was entitled to two pieces. b) a ten-minute Body Scan

This week's daily practice was the Body Scan Meditation which was available in two recordings, one 30 minutes long and the other 20 minutes long. A diary was also distributed and members were asked to keep daily notes on their experience of this practice as well as to be mindful during their daily meal.

3.1.3 Second session

During the experiential process the most characteristic statements of the members were the following:

* ... I was snoring quite often at night and my husband usually woke up complaining about this impossible situation, but from the first day I started meditating the snoring stopped.

* ... I hesitate to say that I often fell asleep
(while meditating).

* ... I often lost focus and my mind wandered and returned. Also, as I suffer from frequent migraines, I noticed that I didn't have any in the first week.

* … It is difficult to do without the interruption of automatic thoughts

* … It went wrong every time I did it…

* … I slept great at night all the days I did this meditation.

Our discussion revolved around the topic of sleep. We talked about the t stage of alertness (β – beta waves > 14 cycles) and the REM and NON REM stages of sleep i.e. α – (alpha) waves 8-13 cycles, θ – (theta) waves 5-7 cycles and δ – (delta) waves 1-4 cycles (OpenStax College, 2021). It was emphasized that meditation leads to the frequency of α-waves, a state that can in turn lead to θ - waves representing light sleep and occasionally δ - waves considered to be the state of deep sleep.

So, falling asleep during meditation is a very common occurrence, especially with beginner meditators, since they often go deeper passing into θ-waves and sometimes even δ-waves. Thus, when the organism sleeps, it is because it is satisfying its immediate need and nothing can be blamed.

Then we have tried to introduce the nature of Sitting Meditation and the reason why this meditation is so different and perhaps more difficult than Body Scan, which is a very structured meditation and therefore in some ways easier to follow. Sitting Meditation, represents for the meditator a hymn to the free mind and gives an opportunity to follow with curiosity and fresh interest the wanderings of the mind hither and thither. So, the point of this exercise is threefold: non striving, non judging, letting go and coming back.

Additionally, we thought it important to explain the different options one has for sitting during meditation, i.e. which zafu or cushion to use and how to sit, also showing the figures contained in Full Catastrophe Living (Kabat Zinn, 1990).

The practice during the Session was a twenty minute Sitting Meditation. The Sitting meditation is a mindfulness practice where individuals sit comfortably, focusing on the breath, body sensations, or thoughts, cultivating awareness, calmness, and mental clarity. It promotes relaxation and reduces stress.

The daily practice for this week was: three days Body Scan alternating with 3 days Sitting Meditation available in two distributed audio recordings, one 30 minutes long and the other 20 minutes long. A log was also distributed and the members were asked to keep daily notes about their practice experience and their pleasant events each day.

3.1.4 Third session

The discussion with members began with the following comments:

*… Sitting Meditation (SM) was ... a real disaster for me since I was
“flying away” with my thoughts all the time. I think Body Scan is definitely a better meditation… it's much better structured.

* … I had a difficulty too at the beginning, I could not remain constantly focused, without letting new thoughts getting in my mind. But after three or four days it went much better.

* … I realized that I don’t know how to breath deeply. One or two members expressed the same concern.
More participants expressed their difficulty with SM. This is why many preferred to follow the twenty minute version.

We discussed about mind wandering and that the normal state of the mind is to fly around with new thoughts very often. Shapiro (2014) argues that according to an MIT study mind wandering accounts for about 47% of our time and that we exercise to reduce it. So our practice would be to acknowledge and welcome the new thoughts, let them go, and easily return to our awareness and

breathing instead of getting upset. It would also be an appropriate reaction to rejoice whenever we perceive this comeback.

In addition, we showed how to practice abdominal breathing and explained that we can gradually learn to exhale longer, thus lowering the heart rate and reducing stress by activating the vagus nerve. Also we have described the physiology of parasympathetic activation and respiratory sinus arrhythmia (Callifronas, 2018; Berntson et al., 1993) Practice during Session: Ten Mindfull Movements (Thich Nhat Hahn)

Meditations for next week included: The Ten mindful movements (as presented by Thich Nhat Hahn) three times, alternating with the Sitting Meditation twice and Body scan meditation once a week taking notes on their practice experience and unpleasant events each day. On the days when the mindful movements are practiced we added a Meditation of Repeated Thoughts (about 15 minutes) compiled from many different texts and ideas, containing visualization of a white wall and sailing ships.

The Repeated Thoughts Meditation encourages observing recurring thoughts without judgment, fostering awareness of mental patterns, creating space for detachment, and cultivating a non-reactive, accepting attitude toward habitual mental chatter.

3.1.5 Fourth session

The discussion process started again with some complaints about Sitting Meditation (SM):

* … this week SM was like a torture, like a Golgotha (Calvary) for me, my mind was distracted and flying away with thoughts, I criticized myself for this inability …

* … generally I was careful only for the 60% of the time, I even had to stop practising SM exercise.

Some positive statements:

* … for me it was ok till the end with SM …

* … it was helpful for me to gain the ability to let go of painful thoughts during the SM, also meditating on repetitive thoughts helped me a lot.

Regarding the practice of mindful movements during the week, the responses were mixed, most were good, but there were also many members who were hesitant to do it on their own twice a week.

We talked about our inner critic and the critical comments we make about ourselves. We often get caught in our conditional thinking, we often fall into the trap of negative thoughts that overwhelm our thinking and cause distress in our lives. Therefore, it is important to change the approach to our beliefs and values in life, since non-judging is one of the nine fundamental attitudes of mindfulness (Kabat Zinn, 2016). In our first steps of mindfulness training we often need to start by not judging our (negative) thoughts.

“What we practice, goes stronger” advocates Shapiro (2017). So, when we meditate with judgement, then judgement goes stronger! The practice of mindfulness can be both like a fight or like a mind cooperation. We stated that “if you want to keep something or somebody close to you , just let it free” and added that we can follow our mind with genuine curiosity and also become happy when our attention leads to the exit our thoughts and judgements and comes back to breath.

In a question about stress and the effect of mindfulness exercise, we tried to explain the benefits that come from reducing muscle tension, releasing endorphins, increasing a-wave activity, improving digestion and sleep, strengthening the heart and lungs, improving blood flow to the brain, promoting mental well-being, etc. A copy of the relevant text was distributed (Davis, et al., 2008; CDC, 2024)

Practice during Session: Mindful Yoga Videos with Lynn Rossy.

Meditations of this week included: Choice of two practices: Yoga 2 by Lynn Rossy or Wheelchair Yoga with Adrienne three times a week followed in the same day by a Meditation of Sounds. Every other day of the above Yoga gym will be followed by a short sitting meditation. Notes to be taken on the experience of their practice every day.

3.1.6 Fifth session

The discussion:

* ... I choose every day a different meditation to practice and I feel much much better now with myself, I often remember your advice

(addressed to the facilitator), in particular, to take a deep breath everytime the telephone rings before responding and everytime I touch the mouse before using my computer.

* … as I said in the previous sessions, before this program I had very frequent migraines and headaches, but after starting this program the headaches have disappeared, except for one time when I had to do a short Sitting Meditation before boarding the plane to cope with a migraine at its onset …

We then discussed this week's "unorthodox" meditation idea of moving toward the difficult feeling rather than escaping the emotional difficulty by "forgetting the painful thoughts!".

We also discussed about Focusing (presented in Chap 1.5) which is a therapeutic method that can be cooperative with Mindfulness meditation. In fact, mindfulness meditation on difficult emotions can ideally be complemented by practicing the therapeutic approach of Focusing and finding the inner meanings of the difficult situation that caused the painful emotions. In turn, Focusing can be assisted by Mindfulness. In fact we can use the meditation as a precursor but also as an afterrunner to the therapeutic process. More on this subject can be said in the next session.

Practice during Session: The Turning Toward Difficult Emotions meditation

The practice of next week included one meditation for emotional and one for physical pain to be practiced two days a week and followed by a selection from any of the previous meditative practices. Notes should be taken on the experience of their practice and the painful moments of this week should be treated with one of the "turning toward to" meditations.

We believe that these two meditations play a central fundamental role in mindfulness meditation training, as they give us the opportunity to understand the transitory nature of our sensations and emotions, but also of some of our physical pains, such as headaches, muscle aches, pains during infections and others. Schellekens et al. (2016) who studied the course and results of MBSR training in women with breast cancer claim that by turning towards fear, sadness and loneliness participants started to acknowledge "the continually changing nature of life" and to experience that "one is not alone in pain and that suffering is inherent to life".

3.1.7 Sixth session

The discussion process:

* … when I make the one minute breath meditation I feel butterflies in my belly as if I am in love, and that makes me feel really good, ... it's like a reboot during the day ….
* … I refrained from blaming towards my son with one stop meditation ... on the other hand I tried twice this week the Sitting Meditation but stopped in both cases in 5 minutes since my thoughts were constantly running one after another ...
* ... I also stopped once the Sitting Meditation in 7 or 8 minutes
* ... I have a recurring thought that this mindfulness practice cannot last for a long time after the eight week course ... so this week I only meditated once...
* ... The meditations of the past weeks are boring me... with new meditations it is much easier for me ...
* ... I'd like to understand this relationship between Mindfulness and Focusing and discuss more on the subject

We discussed that by trying to avoid the passing thoughts we get catched up in a recurring game which often leads to self-rejection. It's useful to practice sometimes the repeated thoughts meditation (see session 3) in order to accept this situation, instead of denying it.

Then we continued our discussion about mindful Focusing by mentioning that the meditation practice cultivates a "spiritual bypassing" by letting go emotional reactions and thoughts, thus avoiding to get stuck in uncomfortable self-conflicts and offering relief from emotional distress. However, this practice can sometimes hinder emotional development and carrying forward in critical issues.

Focusing can build on mindful skills and complement meditation practice by acknowledging deeply buried fears, hidden wounds and blocks, thereby enhancing personal growth and offering long term softening of the inner critic and relief from personal pain. (Rome, 2017). As Weiser Cornell argues "Focusing is like being a friend to your own inner experience"

Some members asked to have several Focusing sessions the Mindfulness program ended.

Finally we introduced the new daily practice stating that the Mountain meditation is about the human pride while the Lake meditation is about peace of mind.

Practice during Session: The Mountain Meditation Meditative Daily Practices of next week are the Mountain Meditation and the Lake Meditation, once a week each along the previous meditations for the other five days of the week.

The Mountain Meditation invites participants to visualize a majestic mountain, embodying its grounded stability and resilience amidst changing weather, symbolizing inner strength and calmness.

The Lake Meditation guides participants to imagine a serene lake, reflecting clarity and depth, symbolizing a calm mind that remains steady and clear despite life's turbulence and shifting conditions.

3.1.8 Seventh session

The discussion this time concerned the preferences of the different meditations*:*

* ... I was fascinated with the lake meditation, I even invited my daughter to meditate together ...

* ... New meditations are rather difficult for me... I prefer the Body Scan ... I meditate in the evening, maybe after midnight ...

*... I also like Body Scan, every time I find something new in it...

* ... Body Scan makes me a bit nervous... I think I prefer Sitting Meditation, of course I am very interested in new meditations ... I feel more focused ...

* .. I prefer Sitting Meditation, I am now aware of my breathing ... but I also do all meditations ... I would like to say that in the last two weeks I have not had any crises or even incidents of tachycardia, from which I suffered for such a long time.

* ... I also like the Sitting Meditation, my insomnia is getting better, I can now fall asleep earlier and I don't wake up as often. The other day I did the meditation for physical pain after a rather painful exam I had...

* ... me too, I did the one for physical pain for my headache and it worked well, although another time it did not work extremely well

* ... in the past I often cried and felt relief ... during this workshop, when I complete the body scan, I feel as if I have cried and feel relief, it is a good experience, it is like fluttering and a kind of discharge…

Our discussion continued on the meaning of the mountain and the lake meditations, the members have been practicing for the last week in the mountain and lake meditation.

In fact, the lake represents deep stillness. It symbolizes the liquid element which is fluid and changing but at the same time maintains its shape and remains at its deepest depth calm despite the occasional ripples of the surface while receiving each moment with fluid force. Thoughts and feelings come for a while, like the choppy surface of a lake, but they can go like a leaf floating on water and leave our being and personality to remain stable and focused. The ripples of our experience cannot affect the depth of our being.

On the other hand the mountains are proud, ready to accept the changes of the environment and remain stable, strong, immovable and natural, during the different seasons. Clouds, strong lightning cyclones and storms surrounding the mountain meet its resistance without losing its softness, even earthquakes can shake but not move it. By having the image of a mountain within us we can strengthen and strengthen ourselves.

A mountain is completely natural and comfortable with itself, no matter how strong the winds that beat against it, no matter how thick the dark clouds that swirl around its summit. So like a mountain, let your mind be steady, knowing that all things pass. Allowing your eyes to close if that is possible or appropriate at the moment, otherwise keeping them open and in either case resting in an awareness of our inner experience. Body sensation: the spine in a natural curve, the head lifted as if hanging from a golden cord, without any tension.

The meaning in this renowned guided meditation by Jon Kabat-Zinn, brought to us by Paola

Bortini, is the pride of a mountain. The Mountain Meditation is designed to cultivate calmness and serenity and connect with our inner strength and steadfastness in the face of challenges. The image of the mountain that remains steadfast in the changing seasons is the symbol of our strength in the face of the everchanging situations of our lives and emphasizes the sense of its nonnegotiable and unshakable worth that is unaffected by the vicissitudes of life, letting them pass us by and let go of the emotional difficulties that do not represent us.

Then we introduced the Lovingkindness Meditation (for discussion see Session #8)

Although the general feeling about this meditation was good, some participants reported that they were not ready to forgive and feel tender towards their significant others and their wider social environment. So, when we talk about Lovingkindness Meditation, we are inevitably asked to deal with the issue of forgiveness. When we feel self-critical, have a conflict within ourselves, are hurt by something, or are angry with others, forgiveness and self-acceptance point the way to relief.

It is a way of healing our inner self from distress and pain. (Alidina, 2010). Self-blame due to higher expectations and a sense of perfectionism can give way to an attitude of modesty and self-acceptance when we practice loving-kindness meditation and discover one by one the things around us and within us that we can praise and be grateful for.

Feeling particularly harsh and self-critical can act as an antidote and create feelings of friendliness and affection. This meditation can be very helpful and even therapeutic as it is quite difficult to feel hatred and friendliness at the same time. It is a way of healing the inner mind and heart from suffering. (Alidina, 2010).

Someone has hurt us, done something wrong, has a conflict in our mind, we are irritated or angry with others or yourself. This harmful condition calls for greater prosperity. Being upset with someone, hurts us more than anyone else. So, we need to be compassionate with ourselves. If we've been thinking about a problem for a while, it might be time to let it go. We don't deserve all this hurt we carry with us. Obstacles and wounds created by a lack of forgiveness can be healed with loving- kindness meditation.

Below are sample statements of this meditation: May I accept myself as I am?

May I find forgiveness for the inevitable hurt we bring to another?

May I love myself completely as I am now no matter what happens?

May I be free from the sufferings of fear and anger?

We can move away from self-criticism. We may be surprised to hear a harsh, self-critical inner voice criticizing us.

We may have higher expectations of ourselves. Try to let them go. Try to accept at least one aspect of ourself that we don't like.

Forgive ourself. Remember that we are not perfect. We can make mistakes.

Let us give our self permission to forgive us.

We can try to be grateful for all that we have and all that we can do. Can we see, hear, smell, taste, and touch? Can we think feel walk and run?

Practice during Session: The Love and Kindness meditation

Meditative Daily Practices of this week concern: The Lovingkindness Meditation, twice a week (13 min), completed by the Breathing Space Meditation on the same day. For the remaining four days, two days Body Scan and two days Sitting Meditation. The daily notes include also STOP practice.

3.1.9 Eighth and closing session

The discussion was about their impressions of the eight week trajectory . The original question was: “What changes have you noticed since you started the workshop?” It was followed by a discussion of how to continue in daily life and meditation practice.

* ... I think I was good student ... I stopped bullying (and terrorizing) myself!

* ... my headaches continue to be absent ... it's the first time in years that I don't even have a pain pill, “just in case”, on my nightstand!!!

* ... my (chronic psychosomatic) pain went to zero and I stopped the medication!!!

* . ... I can more easily accept and even welcome the negative thoughts that cross my mind, I even accepted, without any pressure, a very unpleasant person

* ... I started this journey with joy, because of my (long) experience with yoga, I had to fight my negative thoughts about giving up trying to meditate, now I practice daily.

* … the Body Scan is my favorite… my insomnia has decreased a lot… I also do the raisin meditation three times a week!

* … I find myself being more alert and doing a lot more different things during my work and at home as I can now perceive the onset of a stress episode and stop it much more easily.

* … my sleep has improved a lot, I can sleep better

* … my life is much improved, I use the mindful moments in my job…I prefer the mountain meditation.

Practice during Session: A short meditation on the Practice of Letting Go (Alidina, 2010, p. 57-58) and The Breathing Space Meditation

4. THE QUANTITATIVE FACET OF THE STUDY

4.1 Results

Table 1 shows the results of measurement on the FFMQ at the beginning and at the end of the eight-week program for all participants. There were significant differences start-end differences (increase) in the ' not react', 'observe' and 'non judge' facets of mindfulness with large and medium Cohen's d effect sizes (0.98, 0.59 and 0.62 respectively) while The “act aware” also had apparent baseline differences with a small effect size, but did not reach the threshold of statistical significance.

Tables 2 and 3 present the results of the eight-week program for the participants in the first and second subgroups consisting of twelve members each and show their start-end differences on the FFMQ. In the first group (Table 2) with weekly sessions a medium effect size (0.65) was found with a significant start-end difference (increase) in the ‘nonreact’ facet, while ‘observe’ also had a medium effect size, but it was at the limit of significance ($p<0.06$).On the other hand, in the second group (Table 3) with the fortnightly sessions we found a very large effect size in ‘non react’ (2.16) and ‘act aware’ (0.87) and a medium effect size (0.71) in "non- judge". All three had a significant start-end difference. Furthermore the “observe” facet had a medium effect size (0.60) and was very close to, but did not reach, the threshold for statistical significance.

Significant baseline changes overall (Table 1) as well as in each of the two groups (Tables 2 and 3) were observed with Duncan's general quest which in fact measures the distraction (non mindful) behaviours and attitudes of each workshop member. These changes had medium to large ($50<x<80$) effect sizes as measured by Cohen’s d test.

5. DISCUSSION

As mentioned earlier, our work included both qualitative and quantitative methods in order to gain a comprehensive and detailed picture of the participants' experiences. Moss et al (2015) argue for the importance of a mixed methods approach and demonstrate its value as quantitative methods may not fully capture the experience and benefits of participants. Furthermore, Grossman & Van Dam (2011) add that quantitative methods do not understand “the complexity of the process of mindfulness practice”.

5.1 Discussion on the Qualitative Data

This qualitative study shows the evolution of members' thoughts throughout sessions one to eight with their shared feelings and impressions.

Qualitative studies of mindfulness in general are based in grounded theory and conducted through structured questionnaires (Glaser & Strauss, 2017). Our questionnaire included two questions asked during the sharing process in each session: a) How did your mindfulness meditation practice go in the last week, and b) Have you noticed a small or large change in your habits? Then followed other questions depending on the nature of each answer.

Table 1. (n=24): Results of measurement on the FFMQ at the beginning and at the end of the eight-week program for all participants

	FFMQ (BAER et al., 2006) nonreact	FFMQ (BAER, et al., 2006) observe	FFMQ (BAER et al., 2006) act aware	FFMQ (BAER et al., 2006) describe	FFMQ (BAER et al., 2006) non judge	Duncan General Questionnaire (Duncan, 2007)
Start (mean+SD)	2,94 ± 1,08	3,39 ± 0,87	3,22 ± 0,73	3,63 ± 0,79	3.43 ± 0,79	2,43 ± 0,56
End (mean+SD)	3,22 ± 0,71	3,75 ± 0,68	3,49 ± 0,64	3,61 ± 0,77	3,72± 0,81	2,17 ± 0,45
t	-4,81	-2,91	1,72	0,24	-2,29	3,74
Significance	p<0,001	p<0.01	p<0,1	N.S	p<0.05	p<0,001
Cohen's d	**0,98**	**0,59**	0,35	0,32	**0,52**	**0,60**

Table 2. (n=12): Results of the eight-week program for the participants in the first (weekly) subgroup

	FFMQ (BAER et al., 2006) nonreact	FFMQ (BAER et al., 2006) observe	FFMQ (BAER et al., 2006) act aware	FFMQ (BAER et al., 2006) describe	FFMQ (BAER et al., 2006) non judge	Duncan General Questionnaire (Duncan, 2007)
Start (mean+SD)	2,75 ± 0,69	3,36 ± 0,77	3,34 ± 0,76	3,53 ± 0,99	3.38 ± 1,02	2,40 ± 0,66
End (mean+SD)	3,17 ± 0,81	3,69 ± 0,48	3,36 ± 0,73	3,47 ± 1,02	3,62 ± 0,87	2,21 ± 0,55
t*	-2,26	-1,97	-0,07	0,38	-1,11	2.17
Significance	p<0.04	p<0.06	N.S	N.S	N.S	p<0,03
Cohen's d	**0,65**	**0,57**	-	-	0,32	**0,60**

Table 3. (n=12): Results of the eight-week program for the participants in the second (fortnightly) subgroup

	FFMQ (BAER et al., 2006) nonreact	FFMQ (BAER et al., 2006) observe	FFMQ (BAER et al., 2006) act aware	FFMQ (BAER et al., 2006) describe	FFMQ (BAER et al., 2006) non judge	Duncan General Questionnaire (Duncan, 2007)
Start (mean+SD)	2,75 ± 0,43	3,41 ± 1,00	3,09 ± 0,70	3,73 ± 0,56	3,49 ± 0,53	2,46±0,45
End (mean+SD)	3,27 ± 0,58	3,82 ± 0,84	3,63 ± 0,49	3,74 ±0,42	3,83 ± 0,72	2,13±0,31
t*	-7,49	-2,07	-3,03	-0,05	-2,48	3,14
Significance	p<0,001	p<0,06	p<0,02	N.S.	p<0,04	p<0,01
Cohen's d	**2,16**	**0,60**	**0,87**	**-**	**0,71**	**0,91**

Below we discuss some statements from members of our groups. Similar statements to those shared by members in our study have been discussed in the literature by several authors (parentheses indicate the number of sessions reported).

- On falling asleep and insomnia (as mentioned in sessions no. 2,7,8)

In our second session some participants shared that sleep replaced their meditation effort, while in sessions seven and eight it was reported that “insomnia was greatly reduced”. In fact, insomnia very often leads to the intake of low to high doses of drugs that can be addictive and harmful. Moss et al. (2015) report that mindfulness practice helped participants sleep better. Even with insomnia, a body scan meditation helped them sleep. In addition, they had qualitative findings on the improvement of concerns with a higher degree of acceptance and a reduction of the internal critic. Frank et al. (2015) note in relation to insomnia that 100% of MBSR participants in their group of school teachers treated with sleep medication, discontinued medication by the end of the intervention and reported significant changes in the quality of sleep. Furthermore Gross et al., (2011) have observed in patients with primary chronic insomnia a significant improvement in sleep which was on the same magnitude with the effect seen in their control group that was treated with medication. Last but not least Christensen et al. (2013) worked with Danish breast cancer patients and MBSR and had significant results right after the end of the trial which did not last one year after the RCT.

- On headache, migraine tachycardia, psychosomatic pain, medication habit, stress episode as the beginning of panic attack, (as mentioned in Sessions no. 2, 5, 7, 8) (Carmody, J., & Baer, 2008)

Many authors have reported similar statements in their work. In fact, Garland et al. (2013) observed in their paper that the Non Judging facet of the FFMQ scale was related to mood change and the Acting with Awareness facet was associated with improvement in stress signs. Moss, et al. (2015) reported that mindfulness practice helped some participants cope with physical pain. Bakhshani et al. (2016) showed a significant reduction in the perception of pain intensity in patients with chronic headache, and these results are in agreement with the original trials by Kabat-Zinn (1982) and Kabat-Zinn et al., (1985) who demonstrated a significant reduction in pain, anxiety, depression and improved self-confidence in several clinical cases. In addition, Omidi & Zargar (2014, 2015) conducted randomized clinical trials with patients suffering from tension headache and found that MBSR significantly reduced pain and pain-related anxiety that interfered with daily activities and improved mental health of the participants. (More papers on pain and clinical conditions are discussed in paragraphs 1.3 ,1.4 ,1.5 and 1.6)

- On refraining from blaming the son, self-bullying and (on) accepting a negative person (as stated in sessions 6 and 8)

Similar findings were reported by Frank et al., (2015) arguing that teachers who participated as team members in their MBSR trial reported significant gains in non- reactive and non-judgmental skills. Dundas et al., (2020) conducted a qualitative study to examine the effectiveness of mindfulness in members receiving long- term habit-forming medication. Participant testimonies included statements such as “...(I've developed) a more receptive mind and greater tolerance... (for harmful events)”, or “...I'm more accepting of myself now...before I was too self- judgmental I didn't like myself.'' The authors support the idea that observing thoughts and feelings from a distance appears to reduce self-blame, and that focusing on breathing in anger-provoking experiences offers the conscious choice of whether or not to use (sedative) medication at that particular moment.

- On reactions for the sitting meditation (as stated in session 3).

Our curriculum included the practice of sitting meditation starting after session no. 2. However, the reactions of the members who stated e.g. that (sitting meditation was) "... a real disaster for me..." led us to review the literature on the subject and find that this type of meditation has been suggested to be introduced and started after the fifth session of the mindfulness program, when members have gained some meditation experience. Moreover our members had a choice of two meditations for their daily practice, a 30-minute one and a shorter 20-minute one for very busy days, while Carmody & Baer suggested a 45-minute daily practice for sitting meditation (2008).

- On improved quality of life (as mentioned in session 8).

Similar statements were shared by participants in the qualitative/quantitative study of Moss et al., (2011) examining the effectiveness of a modified MBSR program for older adults. Members reported greater self- compassion and kindness and increased awareness of the present moment. Also, Dussault et al., (2020) agree that mindfulness-based practices are useful for improving quality of life. In addition, previous studies have shown the relationship of better life and well-being with improved scores of aspects of mindfulness (Baer, et al., 2008, Carmody & Baer, 2008, Lau, et al., 2000, 2006).

5.2 Discussion on the Quantitative Data

According to Davidson & Kaszniak (2015), research on mindfulness and meditation faces significant challenges. These include difficulties in accurately measuring mindfulness itself, designing effective control groups for studies, and the inherent limitations of achieving true "double-blinding" in such research. Detailed descriptions of interventions and the use of precise behavioral measures are crucial. While promising progress has been made, more robust studies are needed to definitively establish the efficacy of mindfulness practices. Addressing these methodological challenges will be essential for advancing our understanding and effective application of mindfulness in various contexts. Furthermore Davidson's team presented results that somewhat challenge the effectiveness of mindfulness skills training as measured by the FFMQ, arguing that many (more) psychological interventions increase this cognitive ability. (Goldberg, et al., 2016, Rosenkrantz, et al., 2016). This means that the treatment group could have reported psychological improvements not only due to the specific mindfulness trainings received in MBSR, but also due to nonspecific factors associated with participation in an intervention of any kind, e.g. group intervention.

In relation to these challenges Goldberg (2020) advocates also that research often overlooks the role of common factors like therapeutic alliance, expectancy, and group cohesion, although these factors should be valued alongside MBI-specific mechanisms drawing on broader psychotherapy insights to deepen scientific undestanding and improve MBI effectiveness.

Moreover, despite what has been described above as qualitative gains, it is debated whether the practice of mindfulness is responsible for the tangible positive quantitative results or whether the care we show to team members is also responsible for the positive results. After all, the well known Hawthorn effect is produced because participants feel that they enter an improvement process with better care interest and enthusiasm and in the end show improved results (Brennan, et al. 2008; Levitt &. List, 2011, McCarney et al., 2007).

Furthermore medical studies have discussed a possible trial effect in clinical trials (Braunholtz, et al., 2001; McCarney, et al., 2007*,* Menezes, et al., 2011*),* It is assumed that, beyond simple attention and observation, there may be other factors, such as better care and compliance that could be responsible for the changes.

However, beyond all these comments, mindfulness appears to have tangible effects and specific changes in brain structures with a plethora of neuropsychological and psychobiological research papers submitted to High Impact Factor journals to prove it (see Introduction). This is enough in our opinion to accept the effectiveness of the mindfulness meditations as a clear fact that proves the usefulness of the method.

In fact, mindfulness workshops appear to have numerous significant benefits for participants regarding the on purpose and nonjudgmental awareness of the present moment. There are many studies on the topic that use the FFMQ to quantitatively measure participants' mindful changes.

Actually, Shapiro et al. (2012) showed significant improvements from baseline to post-MBSR on all measures of mindfulness in a group of 22 graduate students. Similar results were shown in a larger study with 309 participants who reported white collar and professional occupations (Carmody et al., (2009).

Furthermore Carmody et al., (2009) showed significant pre-post MBSR changes in all variables with moderate to large effect sizes. They concluded that testable mindfulness based interventions are important to study the rich and complex phenomenon of mindfulness and specifically the way that such programs lead to beneficial outcomes.

Additionally, in a study of 174 participants who had psychological symptoms and/or medical signs, Carmody and Baer (2008) confirmed some very significant pre- post MBSR changes in

mindfulness and wellbeing including reductions in stress and symptoms with moderate to large effect sizes.

Robins et al. (2012) conducted a well-designed randomized clinical trial implementing the MBSR curriculum by highly experienced practitioners. They worked in two equally divided groups, the MBSR group and a no treatment control group. They found significant changes with large effect sizes in the MBSR intervention group. Of particular interest is the fact that members of the intervention group showed a significant reduction in their anger suppression and expression. The authors advocate that this effect was partly due to the fact that participants may have realized that they could experience their emotional state with more self- compassion and less judgmental intent by better regulating and controlling their emotions.

Bohlmeijer et al. (2011) studied the Dutch version of the FFMQ in a large sample (N = 376) of adults with clinical symptoms of depression and anxiety. Participants attended a mindfulness-based workshop. Analysis of the results showed that the 'acting with awareness', 'non- judging' and 'non-reacting' facets were "highly sensitive to change" while 'observe' and 'describe' were "moderately sensitive" as the authors claim. These results are consistent with the findings of the aforementioned Carmody and Baer (2008) who found moderate to large effects on the facets in MBSR curricula.

Regarding the overall results of our study (Table 1), an increase in the 'non react' facet has been detected with a large effect size (Cohen's d=0.98) and a highly significant start-end difference (p< 0,001). Also, the 'observe' and 'non judge' facets showed an increase with a medium effect size (Cohen's d equal to 0.59 and 0.52 respectively) with significant start-end differences (p<0.01 and 0,05 respectively). The 'act aware' facet had an obvious start-end difference with a small effect size (Cohen's d=0,35) but not reaching the threshold of statistical significance in the overall results (Table 1). Nevertheless, in the second group with fortnightly sessions (Table 3) the 'act aware' facet presented a change with large effect size (0,87) and significant start- end difference (p<0,02)

These results show that our intervention had a satisfactory effect which was similar as compared to the results found in the literature. In addition, we found no papers that had a significant therapeutic effect on all five facets simultaneously.

For example Frank et al. (2015) have worked with high school educators and found significant changes in three facets: observing, nonjudgment, and nonreacting. Carmody & Baer (2008) have found large effect sizes for the two facets 'non reacting' and 'observe' while 'acting with awareness', and 'non-judging' had a moderate effect size. Garland et al., (2013) in their study of individuals with cancer found significant difference "Act Aware" facet with an overall 59% decrease in mood disturbance and the "Non Judge" facet followed by 29% reduction in stress symptoms. Frank et al. (2015) had non-significant pre-post changes in the 'observe' facet. On the contrary Moss et al., (2015) found significant change only in the "observe" facet of their quantitative measurements. Last but not least it was rather difficult for us to find in the literature some papers showing significant results in the 'describe' facet.

A highly significant decrease (p<0.001) with a medium effect size was also observed with Duncan's general questionnaire which actually measures the distracting (non-mindful) behaviours and attitudes that were reduced during our intervention. This result seems to be validating our results found by FFMQ.

Focusing more on the results of each of the groups that make up the whole, we can see that in the first weekly group (table 2) there is a medium effect size in one facet (non react) and one more (observe) is just a step outside the limit of significance. In the second fortnightly group (Table 3) we have three facets (non react, act aware and non judge) with impressive results for Cohen's d test (0.71<x<2.16) and significant beginning-end differences (p<0.001, p< 0.02, p<0.04 respectively), while a fourth (observe) is again at the limits of significance. Therefore, there is an obvious superiority of the results of the 2nd (fortnightly) group over the first (weekly) group.

How can these differences between the two groups really be interpreted? Of course, we cannot ignore the fact that the members of each group have not been chosen randomly but based on the order of their enrollment in each group. Accordingly, the factor of large deviation of the idiosyncratic components of the members of the first group from the second cannot be excluded.

However, according to our own experience it seems obvious that meditation becomes easier to master if the practice lasts longer. Also in the middle of the eight sessions program – between the third and fifth session - a temporary fatigue can be often observed and it seems that in the fortnightly group there was more time for recovery. We were unable to find any other paper comparing results of weekly and fortnightly exercise in the literature. Therefore, we cannot have a more secure assessment of the causes of this difference in results between weekly and fortnightly sessions, but the best results with the latter group remain still a fact. However, Marikar Bawa et al. (2023) proposed also some modifications of the MBI program in order to improve the outcome.

6. LIMITATIONS

Our work had a quasi-experimental design with some limitations. First of all, the sample size (although sufficient to detect medium to large effects and significant pre-post differences) was relatively small to draw secure results.

Our work had a quasi-experimental design with some limitations. First of all, the sample size—although sufficient to detect medium to large effects and significant pre-transmission differences—was relatively small to draw secure results.

In addition, most participants were Caucasians**,** had a higher education (Levels six to eight) and the resources to pay for this meditation-based program. It cannot be assumed to what extent our findings can be generalized to populations with different demographic characteristics, as well as for individuals with mood disorders.

As mentioned before, the members were predominantly female. To our knowledge gender differences in the effect of meditation practice have not been reported so far, but such a different response between them cannot be ruled out.

Another limitation was the absence of a randomised control group. The two treatment groups of this study could be considered to control each other, however they were not randomized. In adition the fortnightly group

finished eight weeks later than the weekly group, so the periods of treatment were not exactly the same. Of course, this trial was not about determining the efficacy of mindfulness in general, since it is a fact that has been shown in nonclinical and clinical cases in previous controlled trials (Shapiro et al. 1998; Speca et al. 2000; Grossman et al. 2004).

We also do not want to overlook the fact that the changes and psychological improvements we have already listed and discussed may also be due to undetermined factors outside of our intervention, e.g. their motivation to report positive changes, once they agreed to have their responses used for research purposes, although our facilitator tried to stay away of any such comment. Shapiro et al. (2006) mentions that participants' reports could have been influenced by their intention to avoid the perception of "no changes" after their effort on the program or even by the facilitators' expectations of positive outcomes.

7. FUTURE DIRECTIONS

Our study indicates the need to enrich the quantitative data with qualitative interviews to better assess the participants' experience.

Further assessment of changes in mindfulness would be to compare the results of the five facets in an RCT environment with a group the fortnightly sessions, a weekly MBSR group as designed by Kabat-Zinn, (1982) and/or a control group. Also, our program could be compared with other stress reduction programs with clinical and non-clinical participants to further illuminate and elucidate the potential mechanisms for treating stress.

In addition, future studies will examine in depth the self- report results as well as the long-term impact of these mindfulness workshops on daily life, mindful living, momentary awareness, stress, emotion regulation, etc.

8. CONCLUSION

Our study compared the effects of an 8-session workshop on mindfulness practice conducted in two groups: One group had the traditional weekly session model, while a second group had fortnightly sessions. The results showed overall satisfactory medium to large effect sizes and significant differences in three facets, 'non-react', 'observe' and 'non-judge'. It is also worth noting that the fortnightly session group clearly showed better outcomes than the weekly sessions group. Regarding the qualitative data in our study, most

if not all discomforts, irritations, psychosomatic pains and insomnia were reported to have disappeared or improved significantly. Also, the mindful perception of stress and adverse events has been considerably increased and the quality of life was improved. Concerning the results of fortnightly sessions more studies are needed to confirm them and discuss their place in therapeutic practice

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that have used google scholar, researchgate and Chatgpt 3.5 to add more new refererences to the existing ones exclusively for Chapters 1.3,1.4, 1.5, 1.6.

Details of the AI usage are given below:

1. In Google Scholar and Reserchgate were searched by adding the years 2019-2024 and the keyword “mindfulness”. Then we have selected the appropriate ones.
2. In ChatGPT: Please provide relevant references for the years 2019-2024 in this text “ …. …”. We added the relevant text then reframed the result of the papers cited by the system. However there were many errors in the results given by the AI system.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Adler-Neal, A. L., Waugh, C. E., Garland, E. L., Shaltout, H. A., Diz, D. I., & Zeidan, F. (2020). The role of heart rate variability in mindfulness-based pain relief. The Journal of Pain, 21(3-4), 306-323.

Alidina, S. (2010). Mindfulness for dummies. John Wiley & Sons.

Alidina, S. (2015). The mindful way through stress: the proven 8-week path to health, happiness, and wellbeing. Guilford Publications.

Alomari, H. (2023, June). Mindfulness and its relationship to academic achievement among university students. In Frontiers in Education (Vol. 8, p. 1179584). Frontiers Media SA.

Andersen, S. R., Würtzen, H., Steding-Jessen, M. Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. Assessment, 11(3), 191206.

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. *Assessment*, *11*(3), 191-206.Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self- report assessment methods to explore facets of mindfulness. Assessment, 13(1), 27-45

Bakhshani NM, Amirani A, Amirifard H, Shahrakipoor M. The Effectiveness of Mindfulness-Based Stress Reduction on Perceived Pain Intensity and Quality of Life in Patients With Chronic Headache. Glob J Health Sci. 2015 Aug 6;8(4):142-51. doi: 10.5539/gjhs.v8n4p142. PMID: 26573025; PMCID: PMC4873598.

Benavides-Gil, G., Martínez-Zaragoza, F., Fernández-Castro, J., Sánchez-Pérez, A., & García-Sierra, R. (2024). Mindfulness-based interventions for improving mental health of frontline healthcare professionals during the COVID-19 pandemic: a systematic review. Systematic Reviews, 13(1), 160.

Berntson GG, Cacioppo JT, Quigley KS (March 1993). "Respiratory sinus arrhythmia: autonomic origins, physiological mechanisms, and psychophysiological implications". Psychophysiology. 30 (2): 183–96.

Bohlmeijer, E., Ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form. Assessment, 18(3), 308-320.

Braunholtz DA, Edwards SJ, Lilford RJ (2001), "Are randomized clinical trials good for us (in the short term)? Evidence for a "trial effect"", J Clin Epidemiol, 54 (3): 217– 224, doi:10.1016/s0895-4356(00)00305-x, PMID 11223318.

Brennan JS, Chasen ST (2008). "Clinical estimation of fetal weight and the

Hawthorne effect". Eur. J. Obstet. Gynecol. Reprod.Biol. 141 (2):111-114. doi:10.1016/j.ejogrb.2008.07.023. PMID 18771841.

Callifronas, M. (2018) The roots of psychotherapy. Psychobiology and neuroendocrinology (book), Athens, Assimakis Press.

Canby, N. K., Eichel, K., Lindahl, J., Chau, S., Cordova, J., & Britton, W. B. (2021). The contribution of common and specific therapeutic factors to mindfulness-based intervention outcomes. Frontiers in Psychology, 11, 603394.

Carlson, L. E., Doll, R., Stephen, J., Faris, P., Tamagawa, R., Drysdale, E., & Speca, M. (2013). Randomized controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy for distressed survivors of breast cancer. J Clin Oncol, 31(25), 3119-3126.

Carmody, J., & Baer, R. A. (2007). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulnessbased stress reduction program. Journal of behavioral medicine, 31(1), 23-33

Carmody, J., Baer, R. A., LB Lykins, E., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. Journal of clinical psychology, 65(6), 613-626.

Carmody, J., Crawford, S., Salmoirago-Blotcher, E., Leung, K., Churchill, L., & Olendzki, N. (2011). Mindfulness training for coping with hot flashes: results of a randomized trial. Menopause (New York, NY), 18(6), 611.

CDC (2024**)** Mental Health Action Guide. Promote Mindfulness. https://www.cdc.gov/mental-health-action-guide/strategies/promote-mindfulness.html

Chiesa, A., & Serretti, A. (2011). Mindfulness based cognitive therapy for psychiatric disorders: a systematic review and metaanalysis. Psychiatry research, 187(3), 441-453.

Christensen, J., Andersen, K. K., Flyger, H., ... & Dalton, S. O. (2013). Effect of mindfulness-based stress reduction on sleep quality: results of a randomized trial among Danish breast cancer patients. Acta Oncologica, 52(2), 336-344.

Creswell, J. D., Lindsay, E. K., Villalba, D. K., & Chin, B. (2019). Mindfulness training and physical health: mechanisms and outcomes. Psychosomatic medicine, 81(3), 224-232.

Creswell, J. D., Taren, A. A., Lindsay, E. K., Greco, C. M., Gianaros, P. J., Fairgrieve, A., ... & Ferris, J. L. (2016). Alterations in resting-state functional connectivity link mindfulness meditation with reduced interleukin-6: A randomized controlled trial. Biological psychiatry, 80(1), 53-61.

Davidson, R. J., & Kaszniak, A. W. (2015). Conceptual and methodological issues in research on mindfulness and meditation. American Psychologist, 70(7), 581.

Davis, M., Robins, E. & McKay, M. (2008) The relaxation and Stress Reduction Workbook (Sixth Ed.), Oakland, New Harbinger Publications

De Vibe, M., Bjørndal, A., Tipton, E., Hammerstrøm, K., & Kowalski, K. (2012). Mindfulness based stress reduction (MBSR) for improving health, quality of life, and social functioning in adults. Campbell Systematic Reviews, 8(1), 1127.

Dimidjian, S., & Linehan, M. M. (2003a). Defining an agenda for future research on the clinical application of mindfulness practice. Clinical Psychology: Science and Practice, 10, 166171.

Dimidjian, S., & Linehan, M. M. (2003b). Mindfulness practice. In W. O'Donohue, J. E. Fisher, & S. C. Hayes (Eds.), Empirically sup- ported techniques of cognitive behavior therapy: A step-by-step guide for clinicians. New York: John Wiley.

Duncan, L. G., Moskowitz, J. T., Neilands, T. B., Dilworth, S. E., Hecht, F. M., & Johnson, M. O. (2012). Mindfulness-based stress reduction for HIV treatment side effects: a randomized, wait-list controlled trial. Journal of pain and symptom management, 43(2), 161-171.

Duncan, L.G. (2007) Assessment of mindful parenting among parents of early adolescents: Development and validation of the Interpersonal Mindfulness in Parenting scale. etda.libraries.psu.edu

Dundas, I., Ravnanger, K., Binder, P. E., & Stige, S. H. (2020). A Qualitative Study of Use of Mindfulness to Reduce LongTerm Use of Habit-Forming Prescription Drugs. Frontiers in Psychiatry, 11.

Dusek, J. A., Otu, H. H., Wohlhueter, A. L., Bhasin, M., Zerbini, L. F., Joseph, M. G., ... & Libermann, T. A. (2008). Genomic counter-stress changes induced by the relaxation response. PloS one, 3(7), e2576.

Dussault, É., Fernet, M., & Godbout, N. (2020). A metasynthesis of qualitative studies on mindfulness, sexuality, and relationality. *Mindfulness*, *11*, 2682-2694.

Frank, J. L., Reibel, D., Broderick, P., Cantrell, T., & Metz, S. (2015). The effectiveness of mindfulness-based stress reduction on educator stress and well-being: Results from a pilot study. Mindfulness, 6, 208-216. Fox NS,

Garland, E. L, Manusov, E.G, Froeliger, B, Kelly, A, Williams, JM, Howard, M.O (2014) Mindfulness oriented recovery enhancement for chronic pain and prescription opioid misuse: results from an early- stage randomized controlled trial. J Consult Clin Psychol. 82:448–59. doi: 10.1037/a0035798

Garland, E. L., Hanley, A. W., Riquino, M. R., Reese, S. E., Baker, A. K., Salas, K., ... & Howard, M. O. (2019). Mindfulness-oriented recovery enhancement reduces opioid misuse risk via analgesic and positive psychological mechanisms: A randomized controlled trial. Journal of Consulting and Clinical Psychology, 87(10), 927.

Garland, S. N., Tamagawa, R., Todd, S. C., Speca, M., & Carlson, L. E. (2013). Increased mindfulness is related to improved stress and mood following participation in a mindfulness-based stress reduction program in individuals with cancer. Integrative cancer therapies, 12(1), 31-40.

Geller, S. M. (2003). Becoming whole: A collaboration between experiential psychotherapies and mindfulness meditation/ganz werden: Eine Zusammenarbeit von experienziellen Psychotherapien und achtsamkeitsmeditation/volviéndose pleno/a: Una colaboración entre psicoterapias experienciales y la meditación “Mindfulness”. *Person-Centered & Experiential Psychotherapies*, *2*(4), 258-273.

Gendlin, ET. (1978). Focusing. new York: Everest House. Glaser, Barney G & Strauss, Anselm L., 1967. The Discovery of Grounded Theory: Strategies for Qualitative Research, Chicago, Aldine Publishing Company

Gendlin, E. T. (1996). Focusing-Oriented Psychotherapy. New York: Guilford Press.

Glaser, B., & Strauss, A. (2017). Discovery of grounded theory: Strategies for qualitative research. Routledge.

Hamilton, D. R. (2010). How Meditation Affects the Gray Matter of the Brain. Palouse Mindfulness.com

Hamilton, D.R. (2017) The Five Side Effects of Kindness, Hay House.

Goldberg, S. B. (2022). A common factors perspective on mindfulness-based interventions. Nature Reviews Psychology, 1(10), 605-619.

Goldberg, S. B., Wielgosz, J., Dahl, C., Schuyler, B., MacCoon, D. S., Rosenkranz, M., ... & Davidson, R. J. (2016). Does the Five Facet Mindfulness Questionnaire measure what we think it does? Construct validity evidence from an active controlled randomized clinical trial. *Psychological assessment*, *28*(8), 1009.

Gong, X. G., Wang, L. P., Rong, G., Zhang, D. N., Zhang, A. Y., & Liu, C. (2023). Effects of online mindfulness-based interventions on the mental health of university students: A systematic review and meta-analysis. Frontiers in psychology, 14, 1073647.

Grossman, P., & Van Dam, N. T. (2011). Mindfulness, by any other name…: trials and tribulations of sati in western psychology and science. Contemporary buddhism, 12(1), 219239.

Grossman, P., Kappos, L., Gensicke, H., D’Souza, M., Mohr, D.C., Penner, I.K., & Steiner, C. (2010). MS quality of life, depression, and fatigue improve after mindfulness training: A randomized trial. Neurology, 75, 1141–1149.

Hanh, T. N. (1976). The miracle of mindfulness: A manual on meditation. Boston: Beacon.

Hartmann, M., Kopf, S., Kircher, C., Faude-Lang, V., Djuric, Z., Augstein, F., Friederich, H.C., Kieser, M., Bierhaus, A., Humpert, P.M. and Herzog, W. (2012) Sustained effects of a mindfulness-based stress-reduction intervention in type 2 diabetic patients: design and first results of a randomized controlled trial (the Heidelberger Diabetes and Stress-study). *Diabetes care*, *35*(5), pp.945-947.

Hearn, J. H., & Cross, A. (2020). Mindfulness for pain, depression, anxiety, and quality of life in people with spinal cord injury: a systematic review. BMC neurology, 20, 1-11.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A

meta-analytic review. Journal of consulting and clinical psychology, 78(2), 169.

Hölzel, B. K., Carmody, J., Evans, K. C., Hoge, E. A., Dusek, J. A., Morgan, L., ... & Lazar, S. W. (2009). Stress reduction correlates with structural changes in the amygdala. Social cognitive and affective neuroscience, 5(1), 11-17.

Hoge, E. A., Bui, E., Marques, L., Metcalf, C. A., Morris, L. K., Robinaugh, D. J., ... & Simon, N. M. (2013). Randomized controlled trial of mindfulness meditation for generalized anxiety disorder: effects on anxiety and stress reactivity. The Journal of clinical psychiatry, 74(8), 0-0.

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Vago, D., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. Perspectives on psychological science, 6(6), 537-559.

Hughes, J. W., Fresco, D. M., Myerscough, R., van Dulmen, M., Carlson, L. E., & Josephson, R. (2013). Randomized controlled trial of mindfulness-based stress reduction for prehypertension. Psychosomatic medicine, 75(8).

Hunt, C. A., Letzen, J. E., Krimmel, S. R., Burrowes, S. A., Haythornthwaite, J. A., Keaser, M., ... & Seminowicz, D. A. (2023). Meditation Practice, Mindfulness, and Pain-Related Outcomes in Mindfulness-Based Treatment for Episodic Migraine. Mindfulness, 14(4), 769-783.

Joss, D., Khan, A., Lazar, S. W., & Teicher, M. H. (2021). A pilot study on amygdala volumetric changes among young adults with childhood maltreatment histories after a mindfulness intervention. Behavioural brain research, 399, 113023.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. General Hospital Psychiatry, 4, 33-47.

Kabat-Zinn, J. (1990). Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness. New York: Delacorte.

Kabat-Zinn, J. (1994). Wherever you go, there you are: Mindfulness meditation in everyday life. New York: Hyperion.

Kabat-Zinn, J. (2017). Defining Mindfulness, "Mindful magazine, January 11. https://www.mindful.org/jon-kabatzinn-definingmindfulness "

Kearney, D. J., McDermott, K., Malte, C., Martinez, M., & Simpson, T. L. (2012). Association of participation in a mindfulness program with measures of PTSD, depression and quality of life in a veteran sample. Journal of clinical psychology, 68(1), 101-116.

Lau, M. A.(2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. Journal of Consulting and Clinical Psychology, 68, 615–23.

Lau, M.A., Bishop, S.R., Segal, Z.V., Buis, T., Anderson, N.D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S. and Devins, G. (2006) The Toronto mindfulness scale: Development and validation. *Journal of clinical psychology*, *62*(12), pp.1445-1467.

Lazar, S. W., Kerr, C. E., Wasserman, R. H., Gray, J. R., Greve, D. N., Treadway, M. T., ... & Rauch, S. L. (2005). Meditation experience is associated with increased cortical thickness. Neuroreport, 16(17), 1893.

Levitt, S. D.; List, J. A. (2011). "Was there really a Hawthorne effect at the Hawthorne plant? An analysis of the original illumination experiments" (PDF). American Economic Journal: Applied Economics. 3: 224–238. doi:10.1257/app.3.1.224.

Li, X., Ma, L., & Li, Q. (2022). Corrigendum: How mindfulness affects life satisfaction: Based on the mindfulness-to-meaning theory. Frontiers in Psychology, 13, 1056856.

Li, X., Ma, L., & Li, Q. (2022). How mindfulness affects life satisfaction: based on the mindfulness-to-meaning theory. Frontiers in psychology, 13, 887940.

Li, Z., Lei, D., Ting, L., Yao, R., Jing, W., & Na, M. (2024). The impact of mindfulness intervention on negative emotions and quality of life in malignant tumor patients: a systematic review and meta-analysis. Frontiers in Psychology, 15, 1443516.

Linehan, M. M. (1993b). Skills training manual for treating borderline personality disorder. New York: Guildford.

Maslow AH (1943) A Theory of Human Motivation. Psychological Review 50: 370-396.

Marikar Bawa, F. L., Mercer, S. W., Sutton, J. W., & Bond, C. M. (2023). Mindfulness for people with chronic pain: Factors affecting engagement and suggestions for

programme optimisation. Health Expectations, 26(3), 1287-1307

Marlatt, G. A., & Kristeller, J. L. (1999). Mindfulness and meditation. In W. R. Miller (Ed.), Integrating spirituality into treatment (pp. 67-84). Washington, DC: American Psychological Association.

Mattes, J. (2019). Systematic review and meta-analysis of correlates of FFMQ mindfulness facets. Frontiers in Psychology, 10, 2684.

McCarney R, Warner J, Iliffe S, van Haselen R, Griffin M, Fisher P (2007). "The Hawthorne Effect: a randomised, controlled trial". BMC Med Res Methodol. 7: 30. doi:10.1186/1471-2288-7-30. PMC 1936999. PMID 17608932.

Melis, M., Schroyen, G., Pollefeyt, J., Raes, F., Smeets, A., Sunaert, S., ... & Van der Gucht, K. (2022). The impact of mindfulness-based interventions on brain functional connectivity: a systematic review. Mindfulness, 13(8), 1857-1875.

Menezes P, Miller WC, Wohl DA, Adimora AA, Leone PA, Eron JJ (2011), "Does HAART efficacy translate to effectiveness? Evidence for a trial effect", PLoS ONE, 6(7): e21824, Bibcode: 2011PLoSO...621824M, doi:10.1371/journal .pone.0021824, PMC 3135599, PMID 21765918.

Mosher, C. E., Beck-Coon, K. A., Wu, W., Lewson, A. B., Stutz, P. V., Brown, L. F., ... & Johns, S. A. (2024). Mindfulness to enhance quality of life and support advance care planning: a pilot randomized controlled trial for adults with advanced cancer and their family caregivers. BMC Palliative Care, 23(1), 232.

Moss, A. S., Reibel, D. K., Greeson, J. M., Thapar, A., Bubb, R., Salmon, J., & Newberg, A. B. (2015). An adapted mindfulness-based stress reduction program for elders in a continuing care retirement community: Quantitative and qualitative results from a pilot randomized controlled trial. Journal of Applied Gerontology, 34(4), 518-538.

Omidi, A., & Zargar, F. (2014). Effect of mindfulness-based stress reduction on pain severity and mindful awareness in patients with tension headache: a randomized controlled clinical trial. *Nursing and midwifery studies*, *3*(3).

Omidi, A., & Zargar, F. (2015). Effects of mindfulness-based stress reduction on perceived stress and psychological health in patients with tension headache. *Journal of Research in Medical Sciences*, *20*(11), 1058-1063.

Pagnoni, G., & Cekic, M. (2007). Age effects on gray matter volume and attentional performance in Zen meditation. Neurobiology of aging, 28(10), 1623-1627.

Palmer (2018) Palouse Mindfulness, https://palousemindfulness.com

Pan, Y., Li, F., Liang, H., Shen, X., Bing, Z., Cheng, L., & Dong, Y. (2024). Effectiveness of Mindfulness-Based Stress Reduction on Mental Health and Psychological Quality of Life among University Students: A GRADE-Assessed Systematic Review. Evidence-Based Complementary and Alternative Medicine, 2024(1), 8872685.

Pbert, L., Madison, J. M., Druker, S., Olendzki, N., Magner, R., Reed, G., ... & Carmody, J. (2012). Effect of mindfulness training on asthma quality of life and lung function: a randomised controlled trial. Thorax, 67(9), 769-776.

Prohaska, S., & Matthias, K. (2023). Effectiveness of Mindfulness-Based Stress Reduction as a Nondrug Preventive Intervention in Patients with Migraine: A Systematic Review with Meta-Analyses. Complementary Medicine Research, 30(6), 525-534.

Psarraki, E. E., Bacopoulou, F., Vlachakis, D., Chrousos, G. P., Michou, M., Pelekasis, P., Stavrianou, N & Darviri, C. (2020). The Kentucky Inventory of Mindfulness Skills in Greek Undergraduate and Postgraduate Students. In GeNeDis 2020: Genetics and Neurodegenerative Diseases (pp. 227-238). Springer International Publishing.

Psarraki EE, Bacopoulou F, Vlachakis D, Chrousos GP, Michou M, Pelekasis P, Stavrianou N, Darviri C. (2021) The Kentucky Inventory of Mindfulness Skills in Greek Undergraduate and Postgraduate Students. Adv Exp Med Biol. 2021;1339:227-238. doi: 10.1007/978-3-030-78787-5_28. PMID: 35023110.

Reiner, K., Tibi, L., & Lipsitz, J. D. (2013). Do mindfulness-based interventions reduce pain intensity? A critical review of the literature. Pain Medicine, 14(2), 230-242.

Robins, C. J., Keng, S. L., Ekblad, A. G., & Brantley, J. G. (2012). Effects of mindfulness-based stress reduction on emotional experience and expression: A randomized controlled trial. Journal of clinical psychology, 68(1), 117-131.

Rogers C (1961) On Becoming a Person. Constable, UK.

Rogers C (1980) A Way of Being. Houghton Mifflin Company, USASegal , Z. V., Teasdale, J. D.,. Rome, D. (2018), https://mindfulfocusing.com/

Schellekens, M. P., Jansen, E. T., Willemse, H. H., van Laarhoven, H. W., Prins, J. B., & Speckens, A. E. (2016). A qualitative study on mindfulness-based stress reduction for breast cancer patients: how women experience participating with fellow patients. Supportive Care in Cancer, 24(4), 18131820.

Segal, Z., Williams, M., & Teasdale, J. (2012). *Mindfulness-based cognitive therapy for depression*. Guilford press.

Schmidt, S., Grossman, P., Schwarzer, B., Jena, S., Naumann, J., & Walach, H. (2011). Treating fibromyalgia with mindfulness-based stress reduction: results from a 3-armed randomized controlled trial. PAIN®, 152(2), 361-369.

Seneca L.A. (62 A.D.) Sixth Letter to Lucillus

Sevinc, G., Greenberg, J., Hölzel, B. K., Gard, T., Calahan, T., Brunsch, V., ... & Lazar, S. W. (2020). Hippocampal circuits underlie improvements in self-reported anxiety following mindfulness training. Brain and behavior, 10(9), e01766.

Shapiro (2017) What you practice grows stronger. Youtube: https://www.youtube.com/watch?v=IeblJdB2-Vo

Shapiro, S.L., Carlson, L.E., Astin, J.A., & Freedman, B. (2006). Mechanisms of mindfulness. Journal of Clinical Psychology, 62, 373–386.

Shapiro, S.L., Oman, D., Thoresen, C.E., Plante, T.G., & Flinders, T. (2008). Cultivating mindfulness: Effects on wellbeing. Journal of Clinical Psychology, 64, 840–862.

Shapiro, S.L., Schwartz, G.E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. Journal of Behavioral Medicine, 21, 581–599.

Speca, M., Carlson, L.E., Goodey, E., & Angen, M. (2000). A randomized, wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. Psychosomatic Medicine, 62, 613– 622.

Stein, D. J., Ives-Deliperi, V., & Thomas, K. G. (2008). Psychobiology of mindfulness. CNS spectrums, 13(9), 752-756.

Sullivan, M. J., Wood, L., Terry, J., Brantley, J., Charles, A., McGee, V., ... & Cuffe, M. S. (2009). The Support, Education, and Research in Chronic Heart Failure Study (SEARCH): a mindfulness-based psychoeducational intervention improves depression and clinical symptoms in patients with chronic heart failure. American Heart Journal, 157(1), 84-90.

Sun, S., Sheridan, M. A., Tyrka, A. R., Donofry, S. D., Erickson, K. I., & Loucks, E. B. (2022). Addressing the biological embedding of early life adversities (ELA) among adults through mindfulness: proposed mechanisms and review of converging evidence. Neuroscience & Biobehavioral Reviews, 134, 104526.

Tian, X., Yi, L. J., Liang, C. S. S., Gu, L., Peng, C., Chen, G. H., & Jimenez-Herrera, M. F. (2022). The impact of Mindfulness-Based Stress Reduction (MBSR) on psychological outcomes and quality of life in patients with lung cancer: a meta-analysis. Frontiers in Psychology, 13, 901247.

Tshering, N. (2021). Effect of Mindfulness Meditation Practices on Students' Behavior Change in Secondary Schools in Trashigang District, Bhutan. *Asian Journal of Education and Social Studies*, *20*(1), 13-20.

Vestergaard-Poulsen, P., van Beek, M., Skewes, J., Bjarkam, C. R., Stubberup, M., Bertelsen, J., & Roepstorff, A. (2009). Longterm meditation is associated with increased gray matter density in the brain stem. Neuroreport, 20(2), 170-174.

Vowles, K. E., Witkiewitz, K., Cusack, K. J., Gilliam, W. P., Cardon, K. E., Bowen, S., ... & Bailey, R. W. (2020). Integrated behavioral treatment for veterans with co-morbid chronic pain and hazardous opioid use: A randomized controlled pilot trial. The Journal of Pain, 21(7-8), 798-807.

Wane, M., Telang, P., & Kulkarni, C. (2021). Efficacy of mindfulness meditation on emotional maturity of mothers of cerebral palsy children. *Journal of Pharmaceutical Research International*, 615-622.

Williams, J. M., & Gemar, M. C. (2002). The mindfulness-based cognitive therapy adherence scale: Inter-rater reliability, adherence to protocol and treatment distinctiveness. *Clinical psychology & psychotherapy*, *9*(2), 131-138

Xu, L., Shi, J., & Li, C. (2024). Addressing psychosomatic symptom distress with mindfulness-based cognitive therapy in

somatic symptom disorder: mediating effects of self-compassion and alexithymia. Frontiers in Psychiatry, 15, 1289872.

Zernicke, K. A., Campbell, T. S., Blustein, P. K., Fung, T. S., Johnson, J. A., Bacon, S. L., & Carlson, L. E. (2013). Mindfulness-based stress reduction for the treatment of irritable bowel syndrome symptoms: a randomized waitlist controlled trial. International journal of behavioral medicine, 20(3), 385396.

Zuo, X., Tang, Y., Chen, Y., & Zhou, Z. (2023). The efficacy of mindfulness-based interventions on mental health among university students: a systematic review and meta-analysis. Frontiers in Public Health, 11, 1259250.

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