

MINDFULNESS AND STRESS: UNDERSTANDING HOW AWARENESS IMPACTS STRESS REDUCTION

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ABSTRACT

This literature review discusses research on the relationship between mindfulness and stress. It explores the history of mindfulness and theories of mindfulness, including self-determination theory, mindfulness-to-meaning theory, and dispositional mindfulness. The review examines mindfulness's neurological, biological, psychological, and emotional impacts based on current research. It examines mindfulness interventions and their effectiveness in reducing stress in populations among students, working professionals, and clients undergoing clinical treatment. Studies show mindfulness can lower stress levels, though the impacts vary between populations. Mindfulness is also linked to improvements in behaviors, emotions, and well-being. Meditation practices, including meditation, yoga, and breathing techniques, positively affect biological, psychological, and emotional well-being. As mindfulness continues to expand in the realm of psychology, there is an ongoing opportunity for refining and enhancing interventions. Future research should evaluate the efficacy of novel mindfulness techniques and explore the application of mindfulness in previously unexplored populations, including college students.

Keywords: Mindfulness, Stress

INTRODUCTION

This literature review examines the wealth of research exploring the role of mindfulness and stress across diverse populations. The term mindfulness refers to a positive mental state characterized by awareness through various processes, traits, and practices, along with non-judgmental and non-elaborative attention (Sharma & Kumra, 2022). Through practicing non-judgmental awareness, one does not regard experiences as wrong or right reactively. Instead of focusing on past or future experiences, the active approach of mindfulness is to stay in the present moment (Cheung & Hui, 2023). Practiced in Buddhism for thousands of years, mindfulness is believed to decrease reactivity as consciousness increases (Kelly, 2023). Introducing mindfulness interventions through meditation has increased

well-being, including improved attention, reduced stress in students (Baena-Extremuera et al., 2021), and physical health (Ballantyne et al., 2021). Researchers have found that stress can momentarily decrease by increasing mindfulness through mindfulness interventions (Aguilar et al., 2021; Goldberg et al., 2023). Analyzing the connection between mindfulness and stress in literature can help spread awareness and promote well-being.

This literature review will first address the history of mindfulness, track the progression of relevant literature, and address different mindfulness theories. Observing the impact of mindfulness, this literature review will focus on neurological, biological, psychological, and emotional impacts. Next, this literature review will examine stress and how mindfulness and stress impact specific

populations. Following mindfulness and stress in populations, this literature review will examine mindfulness interventions on stress and their effectiveness by focusing on populations, clinical settings, and psychological effects. Finally, this literature review will summarize significant points in the existing literature base, address gaps in the existing literature base, and outline areas for future study by considering how mindfulness can increase the well-being of individuals who practice it.

SEARCH METHODS

A comprehensive and methodical search was conducted across various electronic databases to encompass a broad range of relevant academic literature and clinical studies for this review. The systematic approach to finding suitable references utilized a variety of trusted databases that publish empirical and peer-reviewed literature, including Google Scholar, Grand Canyon University Library, ProQuest Dissertation and Thesis Global, PubMed, Science Direct, and EBSCOhost. The search strategy was meticulously crafted to ensure relevancy and maintain a dedicated scope focused on mindfulness and stress. Specific keywords and phrases and a combination of Boolean operators were used, and articles published before 2021 were filtered. Search phrases such as mindfulness, stress, the impact of stress, and mindfulness intervention *and* stress, mindfulness *or* stress, and mindfulness intervention *and* stress reduction were employed to maximize the scope of available articles. The criteria for article selection included the publication date (excluding theoretical foundations/seminal work) and being published in respected and recognized peer-reviewed journals or databases.

HISTORY OF MINDFULNESS

Mindfulness practices have been prevalent for thousands of years. Mindfulness, including meditation, is essential to the Buddhist worldview, which involves practicing and cultivating the noble eight-fold path: right effort, right concentration, right mindfulness, right livelihood, right action, right intention, right speech, and right view (Kelly, 2023). Since its origins, over 2,500 years ago, Buddhism and health have been inseparably intertwined (Salguero, 2022). Furthermore, Early Buddhism, known as the original form of Buddhism, examines epistemological assumptions of the nature of human beings, curative factors, psychopathology,

and interventions through a comprehensive study of the mind; however, no treatment model uses Buddhism as its only theoretical orientation (Lee & Tang, 2023). Introduced to the clinical science world in the 1980s by Jon Kabat-Zinn, mindfulness was developed to help patients cope with chronic pain through the mindfulness-based stress reduction program (Upton et al., 2022). Research on mindfulness is cross-cultural and connects to stress in various ways.

The connection between mindfulness and stress is prevalent in research across different cultures and situations. Blevins et al. (2022) observed that dance students at Australian universities with higher levels of mindfulness experienced lower stress levels. Moreover, those with higher stress levels showed lower levels of mindfulness, and the study's results revealed a significant relationship between wellbeing, recovery, stress, and mindfulness (Blevins et al., 2022). Furthermore, in a cross-sectional study of medical students in Saudi Arabia, Alzahrani et al. (2020) found that higher levels of mindfulness were related to lower levels of stress and depression and could help prevent depression when faced with a stressful situation. Lucas et al. (2021) concluded that mindfulness might protect adolescents from internalizing stress-related problems but might not be a buffer to all general stressors. For older adults, MacAulay et al. (2023) revealed that their results were consistent with the mindfulness stress-buffering model of health in that trait mindfulness, which has moderating and mediating effects on health, could help promote resilience to age-related decreases in physical health and might promote successful aging.

Like successful aging, resilience through mindfulness is seen in other forms, such as cognition. Long-term meditation, or practicing mindfulness every month consecutively over the years, was found by Schlosser et al. (2022) to reduce the maladaptive process of repetitive negative thinking in people who meditate regularly. Although there was no change in their technical skill, there is a positive correlation between avoiding fixation error and mindfulness in emergency pediatric surgical students, and their non-technical skills improved (Loś et al., 2021). In the elderly population, Lam et al. (2021) observed that community-dwelling adults in Hong Kong could reduce the effects of mental health from chronic physical morbidity by

increasing mindfulness awareness. By reducing perceived stress, mindfulness improves mental health and has beneficial effects, increasing the quality of life in soldiers serving in military centers (Valikhani et al., 2020). Similarly, introducing mindfulness meditation has significant indirect effects on mental health through meaning in life, self-compassion, and experiential avoidance (Yela et al., 2020). While reviewing the literature on mindfulness, it is essential to consider theories that provide a theoretical framework for understanding its nature; these include self-determination theory, mindfulness-to-meaning theory, and dispositional mindfulness.

THEORIES OF MINDFULNESS

Across the spectrum of mindfulness research, great emphasis has arisen on the implementation and importance of mindfulness (Ryan, Donald, et al., 2021). After reviewing the literature, the theories discussed here suggest mindfulness's usefulness in everyday life and explain specific strategies for execution. A few distinct theories appear to be the most prevalent: self-determination theory, mindfulness-to-meaning theory, and the concept of dispositional mindfulness, which bring together a holistic framework of the existing knowledge for mindfulness implementation.

SELF-DETERMINATION THEORY

The application and impact of mindfulness practices can be understood through the lens of self-determination theory (SDT), offering insights into the motivational factors behind individuals' engagement and the subsequent effects on their well-being. SDT creates a means to establish understanding regarding the various components that facilitate or diminish intrinsic motivation, extrinsic motivation, and psychological well-being (Ryan & Deci, 2020). SDT posits that intentional mindfulness increases internalized awareness of emotions, impulsive behaviors, urges, and desires (Ryan, Donald, et al., 2021). The establishment of autonomy, which is core to the nature of humanity, is vital to the individuals' fully functioning mental capacities (Ryan, Donald, et al., 2021). An external awareness of one's surroundings and congruence with the activity while avoiding excessive attachment are core aspects of autonomy and allow for enhanced self-determination in regulating one's actions (Ryan, Deci, et al., 2021). An important aspect of this relationship is

differentiating between autonomous and controlled motivation. A sense of controlled personal will, self-endorsement, and choice are all distinct features of autonomous thought. In contrast, fear of punishment, excessive ego-reliance, and dependence on external factors underlie the basis of controlled motivation (Ryan & Deci, 2022). SDT indicates that autonomous orientation creates more effective performance results and directly enhances overall well-being, while a mindset of externalized control has the opposite effect (Ryan & Deci, 2022). Autonomy enhances a mindfulness-based approach to life, and this enhancement is a product of the reduction in reactivity and attachment to external stimuli, which are integral elements of the mindfulness practices encouraged by SDT (Ryan, Donald, et al., 2021). Other mindfulness practices, such as the mindfulness-to-meaning theory, can significantly enhance and supplement SDT implementation.

MINDFULNESS-TO-MEANING THEORY

The mindfulness-to-meaning theory (MMT) is a crucial framework for understanding the implementation and effects of mindfulness practices, shedding light on cognitive processes that bridge mindfulness experiences to meaningful outcomes and providing insight into the potential of these practices. The concept of meaning-making refers to the intentional mental processes that encourage the individual to realize growth resulting from personal experiences, regardless of whether these experiences initially appear harmful or beneficial (Williams et al., 2021). The foundation of MMT rests on the idea of creating meaning from life events (Williams et al., 2021), encompassing a broad range of hypotheses and variables, with one of the primary values of MMT being the concept of decentering (Sgherza et al., 2022). Decentering refers to the act of temporarily disconnecting from one's thoughts, feelings, and emotions, which produces lower reactivity to stress and decreased attentional bias to events perceived as negative (Hanley et al., 2021). This disconnection from established schemas within the brain can facilitate new cognitive structures and thought patterns, which may benefit the individual (Sgherza et al., 2022). Even while not actively meditating, mindful decentering throughout the day is associated with boosts in overall well-being (Sgherza et al., 2022). MMT explains this boost in well-being as

a product of the shift from intrusive contemplation to intentional rumination of thoughts (Williams et al., 2021). Correspondingly, the purposeful disruption of the automated process of thought rumination leads to the potential for greater control over behavioral responses (Hanley et al., 2021). This also allows both negative and positive aspects to be analyzed unbiasedly (Hanley et al., 2021). These methods of decentering through mindfulness are what the MMT postulates as processes for more significant meaning-making and reduction of psychological stress (Williams et al., 2021). MMT is a method of mindfulness meditation correlated with individuals possessing higher levels of overall mindfulness or individuals with high levels of dispositional mindfulness.

DISPOSITIONAL MINDFULNESS

Dispositional mindfulness (DM) is important for understanding the implementation and effects of mindfulness practices, offering a perspective where individual traits and inherent mindfulness tendencies contribute to the outcomes and benefits derived from such practices. Also called trait mindfulness, the concept of DM is not considered a theory but rather a state of being and refers to established levels of present-moment attentiveness and awareness (Himes et al., 2021). An individual's ability to possess DM depends on acquiring abilities surrounding awareness, concentration, and observation (Himes et al., 2021). Relating to the Big Five personality scale, DM is positively correlated with similar traits, including agreeableness, openness, and conscientiousness (Haliwa et al., 2021). The frequency of entering mindful states throughout daily activities indicates the individual's propensity toward DM (Jankowski et al., 2022). Furthermore, engaging in a mindfulness practice may induce a state of deeper understanding of reactivity to thoughts, emotions, and external information (Royuela-Colomer et al., 2021). Because of this, those high in DM tend to hold lower levels of depressive symptoms, impulsive behaviors, and overall stress (Royuela-Colomer et al., 2021). Another important finding from DM research is the inverse association between mindfulness and neuroticism, which suggests that possessing greater levels of trait mindfulness may predict reduced negative thought patterns and emotional reactivity (Haliwa et al., 2021). The facilitation of

these beneficial psychological adaptations likely comes from the trained selection of behavioral and mental responses to life experiences, which are fundamental aspects of DM (Royuela-Colomer et al., 2021). The adaptations produced by those with greater levels of dispositional mindfulness are not solely subject to intellect and cognition. Measurable physical and biological changes can be observed in individuals who practice mindfulness, in addition to the aforementioned psychological enhancements.

IMPACT OF MINDFULNESS

Neurological and Biological

Current literature on mindfulness interventions such as yoga, deep breathing, and meditation have examined various interventions' neurological and biological impacts. Neural plasticity is a prioritized research interest (Yu et al., 2021). For older adults, mindfulness interventions increase memory span and gray matter throughout the brain (Yu et al., 2021). This is reinforced by electroencephalogram (EEG) testing during mindfulness interventions, which shows that frontal brain asymmetry significantly differs in adolescents with higher trait mindfulness over those who score lower on trait mindfulness (Deng et al., 2021). Neurologically, mindfulness also impacts brainwaves post-intervention (Jung & Lee, 2021). Students at a Korean university who increased mindfulness also increased alpha and theta waves, which are associated with deep relaxation, but decreased beta waves, associated with heightened stress and anxiety levels. (Jung & Lee, 2021). Examining physical and psychological markers after introducing a mindfulness intervention to students, Aguilar et al. (2021) found that cortisol levels decreased when mindfulness interventions were introduced. Furthermore, mindfulness interventions' biological and neurological benefits are decreased stress hormones and increased neural plasticity through old age (Aguilar et al., 2021; Yu et al., 2021). To increase external validity, more research is needed and will help further understand the benefits of mindfulness in specific populations. The impact of mindfulness-based interventions on psychological outcomes will be explored next.

Psychological

The intersections between mindfulness and psychological well-being are relevant to the literature

review concerning mindfulness. Mindfulness is characterized by paying attention to the present moment with openness, curiosity, and acceptance (Razzera et al., 2021). Mindfulness practices require attention to obtain increased awareness regarding external and internal experiences, greater cognitive and behavioral flexibility, and tolerance of unpleasantness (Razzera et al., 2021). Psychological well-being may be obtained when an individual can identify with three domains of psychological functioning: high positive functioning, low negative functioning, and high negative functioning (Issahaku, 2024). Considerable evidence suggests that mindfulness is associated with improved psychological well-being and decreased levels of psychopathological sympathies in the general population (Lorenzini et al., 2023). Mindfulness and self-compassion can improve psychological well-being and quality of life by reducing negative feelings, including stress and related symptoms reported in people who suffer from stress-associated problems (Tran et al., 2022). Stress is experienced when one's well-being is threatened, and psychological stress occurs when individuals understand that the demands of their environment are beyond their capacity (Valikhani et al., 2020). Mindfulness regulates the over-modulation of emotional response symptoms due to traumatic stress (Lorenzini et al., 2023). Mindfulness traits and related practices are associated with positive mental health, positive affect, and life satisfaction (Tran et al., 2022). Mindfulness may assist individuals in accepting the present moment by exploring their feelings and experiences.

By exploring their feelings and experiences through mindfulness, people can learn to accept the present moment. The psychological well-being of older Ghanaians is mixed with good mental health and depression; this is due to conflicting feelings like satisfaction with social contributions and fear of death (Issahaku, 2024). According to Chan et al. (2024), the interplay of social, psychological, and biological factors is integral in influencing an individual's emotional well-being and emotional regulation through mindfulness practices. Furthermore, mindfulness programs improve the well-being of college students by reducing anxiety and depressive symptoms (Johnson, Acabchuk, et al., 2023). Evidence that mindfulness can rely on modern-day affiliations, such as curing the systemic causes of entertainment, media, adver-

tisement, social networking, switching, and multitasking to achieve job demands, is provided by clinical research (Chachignon et al., 2024). To help limit the increase in stress, people are encouraged to engage in creative activities that help decrease symptoms of anxiety, stress, and mood disorders (Ridley, 2022). By developing a daily ritual of engaging in mindfulness and creative activities, people can help reduce stress (Ridley, 2022). Literature on mindfulness-based interventions and their emotional impact will be reviewed next.

Emotional

Ample literature connects mindfulness and its effect on one's emotional state. Mindfulness is linked to higher levels of cognitive appraisal, less suppression of emotions, and lower levels of internalizing symptoms in young adults (McKee et al., 2021). Johnson, Nadler, et al. (2021) state that mindfulness may decrease negative affect. Higher levels of negative affect are associated with higher stress levels and negative emotions (Johnson, Nadler, et al., 2021). Contrastingly, Himes et al. (2021) theorized that mindfulness changes emotional reactivity. Researchers found that mindfulness helps people pause before they respond to their emotions instead of merely reacting emotionally (Himes et al., 2021). People with higher levels of trait mindfulness experience heightened levels of awareness and decreased levels of reactivity and judgment because mindfulness techniques release negative thoughts instead of ruminating on them (Himes et al., 2021). Neurological theories on emotions and mindfulness will be examined next.

Mindfulness has biological effects on emotions. Neurologically, researchers believe mindfulness affects cognitive processing by regulating emotions instead of seeing emotions as a fixed facet (Deng et al., 2021). By practicing mindfulness, people can improve their frontal lobe symmetry, resulting in improved cognitive focus and the ability to regulate their cognitive processes (Deng et al., 2021). These neurological changes result in the ability to regulate emotions appropriately, acting as a healthy way to reduce stress in the brain and the body (Deng et al., 2021). Neurologically, mindfulness may help coding processes in the brain, making the brain better at understanding and responding to potentially harmful stimuli like negative facial expressions (Shankland et al., 2021). This change

in perception and global processing may be the key to why mindfulness has a powerful influence on emotions (Shankland et al., 2021). Mindfulness practices can boost emotional functioning and are important to address holistically.

One example of mindfulness techniques and their usefulness for emotion regulation focuses on helping people with maladaptive stress eating habits (Hsu & Forestell, 2021). Stress eating can present in many different ways, such as overeating or starving during stress (Hsu & Forestell, 2021). Hsu and Forestell (2021) found that engaging in brief mindfulness exercises during times of stress lessened emotional volatility, resulting in higher feelings of self-control and positive affect, thus lessening unhealthy eating behaviors (Hsu & Forestell, 2021). Another practical way to use mindfulness to boost emotional well-being is listening to music. Liu, et al. (2021) found that listening to mindfulness-based music helped reduce psychological stress and anxiety by developing brain areas devoted to learning, memory, self-referential learning, and emotional regulation. In a study, temporary mindfulness meditation decreased the negative emotions in happy and sad music, and it improved the positive emotions of calm music during recognition and experience, resulting in higher experiences of beauty while listening to this music (Liu, Zhu, et al., 2022). If mindfulness can improve emotional regulation, life satisfaction, and cognitive functioning through music and food consumption, it may be a powerful tool in regulating responses to stress.

MINDFULNESS INTERVENTIONS AND STRESS

Mixed Populations

Mindfulness interventions promote well-being and enhance cognitive, emotional, and behavioral skills in diverse settings such as schools, workplaces, the military, and prisons. These evidence-based practices draw inspiration from contemplative traditions and emphasize present-moment awareness, non-judgmental observation, and intentional focus (Zhang et al., 2021). In a study regarding military populations, mindfulness interventions were used to help reduce stress and muscle relaxation (Krick & Felfe, 2023). Researchers found that mindfulness techniques increased participants' positive affect, frequency of self-care, and physical complaints (Krick & Felfe, 2023). In

addition to stress reduction and muscle relaxation, Sun et al. (2021) found that mindfulness meditation had a significant alleviation of PTSD symptoms compared to the control group. Additional studies are required with more standardization; however, similar results of mindfulness interventions and effectiveness have been associated with a wide range of populations, such as the military, students, and people with long-term illnesses.

Students

Schools have extensively implemented mindfulness interventions, and recent studies have confirmed positive effects on student behaviors. According to Moreno-Gómez et al. (2020), interventions incorporating meditation, visualization, and body awareness successfully promoted adjustments in school behaviors. In a quasi-experiment involving 118 students, there was a significant improvement in school adaptation, problem behaviors, and self-rating, specifically in personal autonomy (Moreno-Gómez et al., 2020). A similar behavioral change was observed in a study by Langer et al. (2020), which explored three aspects of mindfulness: pedagogy, perceived effects, and mechanisms of action. Langer et al. (2020) demonstrated that the inclusion of mindful practices, such as a pedagogical-relational framework, aided in the development of self-regulation strategies and attention. Pedagogical methods were noted to have a substantial and valuable impact on individuals in higher education (Langer et al., 2020). Additionally, findings by Gupta (2021) suggested that mindfulness and meditation, when integrated into pedagogical methods, yielded positive outcomes such as enhanced self-awareness and self-regulation, as well as physical benefits like reduced stress and improved perceived well-being. The therapeutic practices of mindfulness and meditation through pedagogical methods indicate a compelling need for integration into the current academic curriculum due to their perceived benefits.

Given the extensive research on significant effects, there is a notable connection between various stress responses and implementing mindfulness techniques in schools. A study by Hathaisaard et al. (2022) found a substantial reduction in stress among current medical students through mindfulness-based interventions. Although variations of the study, incorporating

cognitive restructuring, relaxation, exercise, and hypnosis, were not included due to the inability to report persuasive results (Hathaisaard et al., 2022), the consistent trend of stress reduction holds across many studies in diverse locations. Hathaisaard et al. (2022) and Andreu et al. (2021) included mindfulness interventions like body scanning, awareness of thoughts, breathing exercises, and meditation in their respective studies. Andreu et al. (2021) specifically investigated the perceptions of at-risk children in Chile, utilizing a semi-interview structure. In addition to the previously discussed benefits such as self-awareness and self-regulation (Gupta, 2021; Langer et al., 2020), Andreu et al.'s (2021) study reported an improvement in children's social relationship skills and attention in classroom settings. These findings and the discussed benefits lay informative groundwork for future research, indicating that certain mindfulness interventions yield broad and promising results on student populations.

Working Professionals

Existing literature on the impact of mindfulness interventions in workplace environments, particularly among healthcare professionals, is marked by conflicting findings. Klein et al. (2020) conducted a study employing mindfulness techniques to alleviate burnout among healthcare workers, reporting some improvements in burnout rates. However, the study highlighted insufficient evidence to assess the overall impact of mindfulness on health professional populations (Klein et al., 2020). In a parallel investigation conducted amidst the height of the COVID-19 pandemic, Osman et al. (2021) utilized brief online mindfulness-based interventions to address burnout and stress in South African healthcare professionals. In contrast to Klein et al.'s (2020) findings, Osman et al. (2021) discovered that these brief online mindfulness interventions reduced perceived stress levels and an increased sense of control and empowerment.

To elaborate, a study focusing on stress and burnout in healthcare workers through Mindfulness-Based Cognitive Therapy for Life (MBCT-L) revealed that mindfulness is particularly effective in addressing non-work-related outcomes, such as overall depression and anxiety (Strauss et al., 2021). While this mindfulness technique influenced participants' perceived overall well-being

and self-compassion, it did not significantly impact burnout, presenteeism, or absenteeism (Strauss et al., 2021). Conducted before the COVID-19 pandemic, the study emphasized the effectiveness of MBCT-L in reducing stress and promoting well-being but acknowledged its limitations in addressing burnout, specifically among healthcare workers (Strauss et al., 2021). Overall, the current research on mindfulness interventions and their effects on working professionals is relatively scarce compared to the studies examining the effects of interventions on students, and more research is required to fully comprehend the contradictory and inclusive relationship.

CLINICAL

Recently, interest has increased in the clinical applications of mindfulness interventions and their effectiveness compared to traditional methods. Several studies have found that mindfulness, in general, is an effective way to treat PTSD symptoms and a way to decrease overall stress (Williston et al., 2021). Mindfulness-based stress reduction (MBSR) is the most prominent and well-researched method to treat excessive stress effectively; MBSR uses meditative practices to create a state of mindfulness that reduces stress and increases focus (Williston et al., 2021). MBSR was highly effective for treating veterans with PTSD, especially when traditional treatments were ineffective (Liu, Zhu, et al., 2022). Furthermore, MBSR has been used to treat people with diabetes who suffer from increased stress and depression due to their condition (Fisher et al., 2023). Fisher et al. (2023) found that MBSR resulted in better mental health for patients, and they recommended clinicians measure cortisol levels in patients with diabetes to determine the effectiveness.

Another popular mindfulness intervention is compassion-focused therapy. Compassion-focused therapy (CFT) is a newer field within mindfulness interventions; it is a therapy where a patient participates in typical mindfulness exercises, compassionate imagery, and the cultivation of compassionate self-identity (Vidal & Soldevilla, 2023). These practices are designed to lead to care and cooperation rather than competitiveness, shame, and or self-criticism, which in turn can lead to stress, depression, or other mental ailments (Vidal & Soldevilla, 2023). Implementing CFT leads to

decreased stress, depression, and increased well-being (Heriot-Maitland et al., 2023). Unfortunately, the youth of CFT means that research is currently somewhat underdeveloped, leading to limitations. The first research limitation is that participants were primarily women (Millard et al., 2023). The second limitation is that current research lacks methodological quality and consistency (Millard et al., 2023). With continued research, CFT could become a more helpful tool within mindfulness interventions like dialectical behavior therapy.

Dialectical behavior therapy (DBT) is a mindfulness intervention that seeks to help people with more severe psychological issues and people who are at higher risk of self-harm (Kothgassner et al., 2021). The activities in DBT center around increasing mindfulness, distress tolerance, and emotional regulation skills (Kothgassner et al., 2021). The most crucial part of DBT is the ability to regulate harmful emotions based on present circumstances (Southward et al., 2022). When the skills associated with emotional regulation were used, researchers saw a decrease in negative emotions and an increase in psychological well-being (Southward et al., 2022). DBT has also been used to help treat the psychological side of myocardial infarctions and other physical diseases (Nourisaeed et al., 2021). Researchers compared DBT and cognitive behavioral therapy and found that DBT was better at decreasing stress and increasing coping abilities in myocardial infarction patients (Nourisaeed et al., 2021). DBT is a powerful mindfulness intervention that can help people better manage stress. The following section will review the literature on mindfulness interventions for negative behaviors.

BEHAVIORAL

Previously, the effects of mindfulness interventions have been discussed within the context of improving general well-being and reducing certain symptoms of psychological disorders or stressful environments; however, mindfulness's effects on practitioners' actual behaviors must also be observed. While improving practitioners' well-being and psycho-emotional state is important, such improvements may not translate to long-term lifetime improvements if they are not accompanied by a change in behavior (Espinosa-Salas & Gonzalez-Arias, 2023).

Positive Behavioral Effects of Mindfulness

This improvement could take two forms: first, the increase of positive behaviors, and second, the reduction of harmful behaviors (Espinosa-Salas & Gonzalez-Arias, 2023). Mindfulness increases positive behaviors like prosocial behavior and Organizational Citizenship Behavior (OCB), and OCB is connected to mindfulness practices (Williams & Polito, 2022). The effect of mindfulness practices on negative behaviors like addiction needs further research to determine effectiveness within settings and patient populations (Schwebel et al., 2020). Due to their strong ties to mindfulness, eating disorder behaviors will be discussed in the following section.

Mindfulness and Eating Disorder Behaviors

Mindfulness interventions reduce negative behaviors associated with eating disorders; however, it is unclear if mindfulness-based interventions are linked to reducing these behaviors or if reductions last after the intervention has passed. Substantial evidence supports a connection between mindfulness practices and improvements in eating disorder behaviors like binge and stress eating (Grohmann & Laws, 2021; Radin et al., 2020). Historically, mindfulness interventions have reduced the severity of binge eating behaviors (Grohmann & Laws, 2021; Mercado et al., 2021). However, when doing follow-ups three to six months after the intervention, Grohmann and Laws (2021) found that the benefits of the intervention did not last, with effect sizes close to zero. These findings support the need for long-term interventions to address this effect decay and explore the relationship between mindfulness interventions and eating disorder behaviors (Grohmann & Laws, 2021). It has been proposed that mindfulness-based therapy reduces negative eating behaviors due to the reduction of the cognitive load associated with words surrounding those behaviors (Sala et al., 2021). Cognitive load is defined as the mental effort to complete a task; with negative eating behaviors, the increased effort one must devote to improvements is attached to food, weight, and body shape (Sala et al., 2021). This explanation would make mindfulness-based therapy a tertiary mediating factor in the reduction of eating disorder behaviors.

Mindfulness practices have also been proposed as a moderating factor between the eating disorder

der Orthorexia Nervosa (ON) and quality of life (QOL), specifically the awareness facet of mindfulness (Kalika et al., 2023). Findings by Kalika et al. (2023) support a perspective of mindfulness interventions and practices as tertiary factors in eating disorder treatment. Recent research on the relationship between mindfulness interventions and eating disorders has been conducted within female populations; in multiple studies, women comprised between 80% to 100% of the participant group (Felske et al., 2020; Kalika et al., 2023; Sala et al., 2021). This is due to the well-documented disproportionate levels of women with eating disorders compared to men (Sala et al., 2021). Consideration should be taken that the current findings on the relationship between mindfulness and eating disorders may not be as applicable to men as they are to women (Kalika et al., 2023). Mindfulness interventions help treat eating disorder behaviors as tertiary treatment methods and can directly impact behavior in the OCB-mindfulness relationship.

Mindfulness, Organizational Citizenship Behavior (OCB), and Workplace Outcomes

Organizational Citizenship Behavior (OCB) and mindfulness have a strong relationship and can result in positive outcomes within the workplace. OCB is voluntary behavior that benefits the organization, goes beyond an employee's typical or official duties, and is not rewarded through the organization's payment system (Jobbehdar Nourafkan et al., 2023). Following a mindfulness meditation intervention, the intention to perform OCBs is increased; furthermore, because the intervention only lasted 10 minutes, a brief mindfulness intervention can increase OCBs (Williams & Polito, 2022). The relationship between OCB and mindfulness may be explained and mediated by the positive emotions fostered through mindfulness practices, ultimately leading to increased prosocial behaviors like OCB (Arora, 2021). Arora (2021) established a link between positive emotions, mindfulness, and prosocial behavior, reinforcing that OCBs, after mindfulness interventions, create elevated positive emotions; this is supported by the empirical research conducted by Williams and Polito (2022). Williams and Polito (2022) found that individuals practicing mindfulness during meditative interventions were more inclined to report prosocial workplace intentions, including engagement

in OCBs. The OCB-mindfulness relationship can be applied to different demographics and increase well-being.

An increased well-being results from the OCB-mindfulness connection, which works across different demographics. Jobbehdar Nourafkan et al. (2023) found that mindfulness increases eudaimonic well-being, and eudaimonic well-being mediates the OCB-mindfulness relationship. Eudaimonic well-being is the satisfaction of a person's positive relationship, growth, and fulfillment needs (Jobbehdar Nourafkan et al., 2023); these findings are supported by Arora (2021), as satisfaction leads to increased positive emotions. The OCB-mindfulness relationship can be applied to multiple demographics and settings. Research by Williams and Polito (2022) aimed to test an Australian corporate workplace setting, but findings were consistent with working adults surveyed online. Furthermore, Asthana (2021) found that mindfulness interventions increased Master of Business Administration Students' intentions to enhance their OCBs. Mindfulness interventions have a strong relationship with increasing OCBs and OCB intentions across multiple organizational and business settings, and such findings are likely due to the increases in positive emotions associated with mindfulness interventions and practices. These findings highlight the effects and importance of mindfulness interventions when attempting to encourage positive behavioral and lifestyle outcomes.

CONCLUSION

This paper described three prominent mindfulness theories, the impact of mindfulness physically and psychologically, and current interventions focused on mindfulness. These theories consist of self-determination theory, mindfulness-to-meaning theory, and dispositional mindfulness. Each of these theories views mindfulness differently, and how practicing it can have varying effects on one's physical and psychological well-being. Adopting these theories can lower depressive and stress levels and enhance overall well-being (Hanley et al., 2021; Royuela-Colomer et al., 2021; Ryan & Deci, 2022).

The connection between mindfulness and one's mental and physical well-being is demonstrated in the research. Mindfulness can lower

stress and promote successful aging (MacAulay et al., 2023). Mindfulness can improve neural plasticity, increase brain gray matter, and correct frontal lobe symmetry (Deng et al., 2021; Yu et al., 2021). Mindfulness practices differ in effectiveness when applied to specific populations. When mindfulness is integrated into schooling, students have enhanced self-awareness and self-regulation, improving their physical and psychological states. When examined in the workforce (specifically healthcare workers), mindfulness practices did not significantly impact burnout, presenteeism, and absenteeism. Mindfulness-based stress reduction (MBSR) was found to be highly effective for treating veterans with PTSD and those with diabetes who suffer from stress and depression.

In conclusion, mindfulness interventions such as yoga, breathing techniques, and meditation have a beneficial effect biologically, psychologically, and emotionally. With the continual growth of mindfulness in the psychological field, more interventions will be improved and perfected. Future research should further examine the effectiveness of new mindfulness techniques and current applications of mindfulness in new populations, such as college students.

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