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The Effect and Mechanism of Mindfulness Training on Psychological Stress in College School Students

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Abstract: This present research delves into the multifaceted world of mindfulness, exploring its definition and emphasizing its pivotal role in promoting mental health, especially for the utilisation of college students. Investigating various research methodologies, including behavioral and neuroimaging studies, the paper unveils the effects of mindfulness on psychological well-being. Noteworthy findings include compelling evidence supporting its ability to reduce stress and anxiety, enhance emotional regulation, and bolster resilience and coping mechanisms. The article further dissects the intricate mechanisms underlying mindfulness, encompassing psychological aspects such as exposure and confrontation, acceptance of experiences, and changes in thinking patterns, as well as neurological factors like impacts on brain structure and function, neural plasticity, cognitive enhancement, and neurochemical changes associated with the stress response. In conclusion, the article underscores the significance of mindfulness in fostering mental well-being, providing a succinct summary of observed effects and mechanisms. It also acknowledges study limitations and proposes potential future research directions, underscoring the enduring relevance of mindfulness in advancing mental health across diverse populations.

Keywords: mindfulness, stress, college students, educational psychology

1. Introduction

Mindfulness, rooted in Eastern meditation practices, is a deliberate and non-judgmental method of attentiveness to the present moment, fostering a heightened state of consciousness. Mindfulness-based stress reduction (MBSR) employs mindfulness meditation to alleviate suffering associated with physical, psychosomatic, and mental afflictions. This structured program aims to enhance awareness of moment-to-moment experiences of perceptible mental processes, operating on the premise that heightened awareness leads to more accurate perceptions, diminished negative affect, and increased vitality and coping abilities [1]. Concurrently, positive thinking has gained prominence in Western clinical settings, serving as a focal point in recent research endeavors [2]. This paper offers a comprehensive exploration, delving into the effects and underlying mechanisms of positive thinking training on psychological stress.

Positive thought training focuses on the gradual acquisition of positive thought awareness or positive thoughts. The concept of positive mindfulness consciousness has its origins in the earliest Buddhist literature but is neither religious nor esoteric [3]. Several Buddhist treatises have elaborated psychological theories of mindfulness in which mindfulness has always played a central role [4].

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Right mindfulness is characterised by calm, non-evaluative and sustained momentary awareness of perceptible mental states and processes. This includes sustained, instantaneous awareness of bodily sensations, perceptions, emotional states, thoughts, and imagery. Orthokinesis is unconscious: it simply implies sustained attention to ongoing mental content without thinking about, comparing, or otherwise evaluating the ongoing mental phenomena that arise during the practice. Positive thinking can therefore be regarded as a form of natural or participatory observation of perceptible mental phenomena that normally occur in waking consciousness. This concept and approach are based on the following assumptions: (1) human beings are usually largely unaware of their moment-to-moment experience and tend to work in an "autopilot" mode; (2) Human beings can develop the ability to pay sustained attention to mental content; (3) the development of this capacity is gradual, progressive, and requires regular practice; and (4) awareness of the moment-to-moment nature of the experience will provide a richer, more vital sense of life, as the experience becomes more vivid and active psychic engagement replaces unconscious reactions; (5) this sustained, non-evaluative observation of mental content will gradually increase the veracity of perception; and (6) as a result of being able to more accurately perceive one's mental responses to external and internal stimuli, more information can be gathered that will enhance effective individual-wide action and bring about a greater sense of control.

In short, mindfulness training is the process by which individuals learn to notice and be aware of the objective experiences that are occurring within and outside of their bodies and minds in the here and now, without judgment, acceptance, and curiosity. These experiences include the individual's physical sensations, behavioural responses, emotional experiences and thought activities.

2. Effects of Mindfulness

2.1. Research Methodologies

The research methods of positive thinking in general include behavioural experimental method and neuroimaging method. Behavioural experimental methods divide individual subjects into an experimental group and a control group. The experimental group, after applying training in positive thinking stress reduction therapy, completed experimental scales such as the total score on the Brief Mindfulness Scale and the scores on the five subscales of Tension-Anxiety, Confusion-Bewilderment, Exhaustion-Inertia, and Forcefulness-Activity, were significantly lower than the corresponding scores in the control group [5].

In recent years, however, brain imaging studies have painted a more complete picture of the mechanism of action of positive thinking training. Specifically, the application of neuroimaging techniques such as Electroencephalogram (EEG), Event-related Potentials (EPRs) and Functional Resonance Imaging (fMRI) has provided unique evidence of the brain mechanisms of mindfulness [6]. unique evidence for the brain mechanism of positive thinking.

2.2. Effects on Psychological Well-being for College Students

The effectiveness of positive thinking training has received increasing attention from researchers. Grossman et al. conducted a meta-analysis (meta-analysis) of 20 studies of the effects of MBSR. Although the number of these studies is relatively small, these results suggest that MBSR can significantly address non-clinical problems [6]. In the late 1970s, Dr Jon Kabat-Zinn of the Massachusetts Institute of Technology (MIT) Center for Stress Management began to apply mindfulness training to the management of pain and stress in college school students and achieved significant results. With the widespread recognition of MBSR in the United States, several psychotherapies using mindfulness training as a core technique or foundation have been developed. For example, Mindfulness-based Cognitive Therapy (MBCT), which combines mindfulness training with cognitive therapy, Dialectical Behavior Therapy (DBT), which is a dialectical unification of

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mindfulness training and behaviorism, and Relational Framework-based Acceptance and Commitment Therapy (RFT), which is based on the theory of acceptance and commitment. Dialectical Behaviour Therapy (DBT), and Acceptance and Commitment Therapy (ACT), which is based on the theory of relational framework and the process of the six cores of Acceptance and Commitment Therapy (ACT). Today, mindfulness training is widely used in the U.S. healthcare system for both physical health treatment and treatment of psychological disorders. Therapies based on positive thought training have also been described by researchers as the third wave of cognitive behavioural therapy [7].

Empirical studies have shown that positive thinking training can be effective in helping college school students address their stressful stressors. In a study conducted by Rosenzweig et al. with college students, the experimental group scored significantly lower than the control group on the Brief Mindfulness Scale (BMS) and the five subscales of Tension-Anxiety, Confusion-Bewilderment, Tiredness-Inertia, and Powerful-Activity [8]. Oman et al. have also shown that training in Positive Mindfulness Stress Reduction Therapy (PMSRT) reduces anxiety levels and helps college students significantly increase their sense of hope and forgiveness. Jain et al. intervened with university students with two types of intervention: positive thinking meditation and muscle relaxation training, which showed that both experimental groups experienced a decrease in depressed mood and an increase in positive mood compared to the control group and that the positive thinking meditation group experienced a decrease in the level of distracted and exhaustive thinking activities [9]. It can be seen that the results of positive thinking training in the general population of college school students indicate that positive thinking stress reduction therapy can effectively improve an individual's ability to be aware, reduce anxiety, alleviate depression, reduce negative emotional experiences, and improve an individual's ability to cope with stress.

3. Mechanisms of Mindfulness

3.1. Psychological Mechanisms

Mindfulness training operates through three core psychological mechanisms: exposure and confrontation, acceptance, and changes in thought patterns and perceptions.

(1) Exposure and Confrontation: This aspect focuses on developing an awareness of one's present physical and mental experiences without judgment or avoidance. By consciously observing these experiences, the individual can confront his or her avoidance tendencies, which is an essential first step in problem-solving.

(2) Acceptance: Positive Mindfulness training encourages a non-judgmental observation of experiences that leads to a holistic understanding and problem-solving by accepting all experiences without rejection or denial. It supports successful emotional regulation by recognising and accepting avoided emotions, such as acknowledging frustration to prevent further deterioration.

(3) Altered thinking and perception: Positive thinking requires a non-recognition observation of experience, which leads to a shift in thinking and perception. This differs from traditional cognitive therapy in that it emphasises a change in attitude towards the perception rather than a change in the content of the perception. The process involves transitioning from being the observing subject to becoming the observing object, encouraging de-automation and de-centring. This results in more adaptive and flexible responses to environmental stimuli, conferring a greater sense of self-control. These changes influence emotion regulation patterns and processes by breaking down automated response patterns, leading to more effective emotion regulation and a positive feedback loop of emotion regulation self-efficacy [10].

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3.2. Brain Mechanisms

In terms of the brain mechanisms of positive thinking, it has been found that long-term positive thinking training leads to changes in grey matter density and cortical thickness in local brain regions, which are mainly brain structures related to sensory processing, learning, memory, attentional processes, and emotion and emotion regulation, such as the anterior insula, the hippocampus, the prefrontal lobe, and the anterior cingulate gyrus.

The anterior insula (AI) is an important structure for sensory and consciousness processing, and it receives information from somatic, visceral and cutaneous receptors to produce somatic sensations. Studies have found that prolonged orthostatic training leads to a significant increase in the grey matter density or cortical thickness of the AI [11] This suggests that long-term training in positive thinking enhances an individual's awareness of internal and external somatic sensations. This increased awareness of somatic sensations led to a stronger connection between the individual and his or her own body.

Recent studies have also found that changes in frontal theta waves and occipital gamma waves seem to be better indicators of positive thinking. theta waves are brain waves with frequencies between 4 and 8 Hz. It usually occurs during deep relaxation, light sleep, contemplation and subconscious state. Theta wave is a brain wave with a frequency between 4~8Hz, which usually appears in deep relaxation, light sleep, contemplation and subconscious state, when the individual is susceptible to cues, creativity, inspiration, intuition, learning and memory efficiency is improved. gamma wave with a frequency above 35Hz is related to memory and holistic thinking. Numerous studies have found that the higher the individual's level of positive thinking experience, the higher the amplitude of theta and gamma waves [12]. Long-term mindfulness training has been associated not only with high-amplitude gamma-band EEG oscillations and phase synchronisation [13] but also with increased amplitude of theta waves [14]. The higher the experience level of the perceiver, the more pronounced the change. Recently, Cahn et al. used a strictly balanced experimental design and mind wandering as a control condition to record the spontaneous EEG activity of long-term mindfulness trainers over 21 minutes. The results also showed that mindfulness was associated with significant increases in frontal θ-wave and parieto-occipital γ-wave amplitudes, and was closely related to the level of individual experience. The changes of theta and gamma waves in positive thinking training suggest that positive thinking can regulate the neural electrical activity of the brain to promote attention, memory and learning [15].

4. Conclusion

Positive thinking training, particularly within mindfulness-based interventions, is gaining attention for its impact on mental well-being. Emerging from Dr Jon Kabat-Zinn's work, it has evolved into therapeutic approaches like Mindfulness-Based Cognitive Therapy (MBCT) and Acceptance and Commitment Therapy (ACT). Positioned as the third wave of cognitive-behavioral therapy, positive thinking interventions show promise in addressing stressors and enhancing psychological outcomes. Diverse studies suggest potential benefits, including reduced anxiety, enhanced hope, improved mood, and better stress coping. Psychological mechanisms involve exposure, acceptance, and alterations in thought patterns. Structural brain changes related to sensory processing and emotion regulation further highlight its holistic impact. Positive thinking interventions can foster mental health, marking their significance.

Despite the promise, limitations exist. Studies often focus on specific populations like college students, limiting generalizability. Heterogeneity in methods and outcome measures hinders standardization. Reliance on self-reports introduces bias, and long-term sustainability is uncertain. Rigorous trials are needed for broader evidence. Future research should address these limitations,

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exploring enduring effects, comparative effectiveness, scalability, and cost-effectiveness. Longitudinal studies can unveil lasting impacts while investigating synergies with other modalities that may offer innovative approaches. A nuanced understanding of positive thinking, mindfulness, and mental health is crucial for tailored and effective interventions.

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