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Review Article

Mindfulness, Meditation, and Childhood Anxiety Disorders: An Overview of an Effective Psychotherapeutic Approach

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Abstract

In US, almost 7 % of children aged 3-17 years are diagnosed with anxiety disorders. Numbers are even higher in adolescence, where up to a third of adolescents between ages 13-18 have anxiety disorders in their lifetime. Global prevalence is estimated to be close to 3 % between 5- 17 years of age. Over the years, multiple treatment approaches, between medications and psychotherapeutic interventions, have been identified for anxiety disorders. As the focus is increasing on this age group, newer, brief, efficacious therapies are investigated, which also have sustained benefits. Generations old concepts of meditation and mindfulness has gained grounds in last couple of decades to address various mental health disorders across the life span. These Mindfulness based interventions (MBI) have evolved significantly recently and they are considered as powerful psychotherapeutic tools in children and adolescents for various mental health disorder including anxiety disorders. This article explores current evidence on this promising intervention and provides further insight into future considerations. Some early studies suggest improvement in anxiety and other mental health symptoms in children and adults. There are no known harmful effects. However, so far studies in children and adolescents have had small sample sizes and mixed results. More robust studies are needed to verify effectiveness of these approaches. Also, long term measures of MBI have found continued effectiveness in few studies done on adults but results yet need to be replicated in children and adolescents. Effectiveness of these psycho- therapeutic approaches should also be compared with and without medications in long term. This will provide more guidance if combined approach has more advantages similar to Cognitive Behavioral Therapy (CBT) and medications or if it can also be used as a standalone treatment approach with similar efficacy.

Keywords: Mindfulness; Anxiety Disorders; Mindfulness - Based Interventions in Children

Key Points

- Early studies on MBI in adults have shown promising results in improving mental health symptoms including anxiety, stress, and depressive symptoms.
- Some studies done in children and adolescent population have had mixed results but their sample sizes were fairly small.
- MBI is further branching to more specialized treatment approaches to develop symptom specific models.
- There is evidence suggesting that there could be corresponding changes in brain with improvement in self- reported measures using MBI.

- More robust studies are needed to verify advantages of MBI in this population. Studies focusing on comparing results with and without medications will also assist in quantifying measured benefits.

- There are also reports indicating sustained benefits of MBI after years in adults. Those results still need to be replicated in children and adolescents.

Introduction

Body responds in apprehension when fearing a threatening situation. This anticipatory stress, triggering emotions like fear, is the brain's way to protect the individual. However, when the threat response is malformed or broken, then it can produce exaggerated fear. This broken threat response causes individuals to fear about situations that are normally not frightening. These heightened emotional dysregulation or anxiety disorders are also associated with physiological changes including increased muscle tension, sleep irregularities, causing inattention and inability to focus [1].

According to the National Comorbidity Study Replication (NCS-R), one year prevalence of any anxiety disorder in last one year in US adults older than 18 years of age, is close to 19.1% with females having higher prevalence than males [2]. In US, almost 7.1% of children aged 3-17 years are diagnosed with anxiety disorder. Numbers are even higher in adolescence increasing up to a third of adolescents between ages 13-18 having anxiety disorders in their lifetime [3-5]. Global prevalence is estimated to be close to 3.2% between 5-17 years of age, these are fourth highest figures after attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), eating disorders, depression [6]. Untreated or undertreated anxiety symptoms can be amplified in this population due to several factors including anxiety disorders course itself, low motivation, lack of desire to continue medications or perceived longevity of the pharmacological and psychotherapeutic treatment options. Current research focuses on discovering approaches that are time limited and brief with comparable or superior results. MBI have become increasingly popular recently and have diverse applications in various mental health disorders.

Concepts of mindfulness based interventions

Mindfulness Based Interventions (MBI) have their origin from core principles of meditation and yoga, where one practices focusing in the moment and decreasing ruminative thought processes about the future. However, it does not always include transcendental meditation. Instead, it is a way to bring attention to continued movement around us and changes that result from those movements, behaviorally and emotionally. Treatment approaches facilitate bringing conscious focus on the present, new situations, being aware of differences in outlook/perceptions and circumstances and this ability to compos mentis is called metacognition [7,8]. It works on understanding the process of an event, as it occurs, making one more attuned to their own emotions [9,10].

Several recent studies have suggested MBI can be helpful in treating depression, anxiety disorders, psychological distress, fatigue, sleep, inattention [11,12]. In 2017, Guendelman., *et al*. proposed improved cognitive control, self-awareness and regulation as a result of using MBI [13].

MBI has been further modified to address different target populations. These are brief psychotherapy approaches, up to 8, mostly group based sessions [14,15]. Some of the more commonly used approaches are mindfulness-based stress reduction (MBSR) used for stress and pain; mindfulness-based cognitive therapy utilized for depression (MBCT) aiming to reduce automatic negative thoughts and ruminative thinking; dialectical behavior therapy (DBT) to treat emotional dysregulations in patients diagnosed with borderline personality disorder and acceptance commitment therapy (ACT) which can improve individuals' psychological flexibility [15-20].

Role of mindfulness based interventions in children and adolescents

Ames., *et al*. in 2014, discussed improvement in symptoms of depression in adolescents between ages 12 - 18 after following 8 weeks of mindfulness meditation [21]. Later in 2017, Dvorakova., *et al*. found reduction in anxiety and improved life satisfaction after 8 weeks of MBI in freshman students who were at a four-year university programs [22]. However, there are also multiple MBI based studies with limited outcomes in children and adolescents, especially when compared with other evidence based approaches like Cognitive Behavioral Therapy (CBT). Many of these studies had small sample sizes, hence low power impacted the results greatly. In 2014, Britton., *et al*. studied MBI's effect on sixth grade students'

mental health and affect. They did not find significant benefits in terms of overall improvement but MBI seemed to be helpful in reducing suicidal ideation and self-harming behaviors [23].

Zoogman., *et al*. completed a meta- analysis of Mindfulness based studies for studies up to 2011, in less than 18 years old and suggested that outcomes were better in the clinical population than non- clinical participants and psychological results were better than cognitive and physiological improvement [24].

Childhood abuse survivors also showed sustained benefits from MBSR 2.5 years after treatment with diminished anxiety (Brief Symptom Inventory, BSI), depressive (Beck Depression Inventory, 2nd Edition, BDI-II) and Post Traumatic Stress Disorder (PTSD Checklist, PCL) symptoms [25].

Crowley., *et al*. 2018, observed changes in anxiety in 12-13-year-old adolescents using Group Mindfulness Therapy (GMT). They implemented several pre- and post- subjective measures including The Screen for Child Anxiety Related Disorders (SCARED), Multidimensional Anxiety Scale for Children (MASC); parent report – Child Behavior Checklist (CBCL), Youth Self Report (YSR). YSR ratings indicated improvement in internalizing symptoms and externalizing problems. Parents reports also measured improvement. There are noticeable improvements in anxiety, depression, perceived stress and inattention [26].

MBI has been explored as a treatment option for young cancer patients with anxiety disorders and fatigue. Where there were some promising results in adults [27], outcomes were noticed to be inconclusive in children and adolescents however, study constructs were limited due to several factors including difficulty in recruiting patients for the study [28].

Neurophysiological Changes from MBI

After completing MBI, reduction in resting state amygdala activity was observed by Taren., *et al*. in 2013 [29]. Few studies used Magnetic Resonance Imaging (MRI) to measure and quantify benefits of MBI to collaborate with self-report measures. Results of some of those determined increased left hippocampal gray matter density and white matter in the anterior cingulate cortex (MCC) [30,31].

Many studies are done in adults monitoring EEG changes. These studies have looked at changes before and after implementing MBI. Decreased resting alpha waves are predicted to be closely related to overactivation of the brain and are implicated in several mental health conditions including depression and schizophrenia [32- 34]. Diminished beta waves are tied to inability to focus and increased anxiety [35]. Low theta activity is also related to anxiety disorders and emotional dysregulations [36].

Where Zhou., *et al*. and Williams., *et al*. discovered lower right frontal asymmetry using MBCT in undergraduate students and young adults respectively, Moynihan., *et al*. showed similar reduction in right frontal asymmetry in elderly implementing MBSR [37-39].

Shanok., *et al*. (2019), completed a study on preadolescents between ages 7-10 years old using brief sessions of Mindfulness Meditation Intervention (MMI) and measured EEG changes along with other self-report instruments including Center for Epidemiologic Studies Depression Scale (CES-D), the Behavioral Avoidance/Inhibition Scales (BIS/BAS), and the Positive and Negative Affect Schedule (PANAS). Initial results suggest increased alpha cortical coherence throughout the brain and increased power of theta, beta and alpha waves in frontal and central brain. There were diminished subjective symptoms of anxiety and depression symptoms, but no significant changes were observed in frontal and posterior alpha asymmetry which are predicted to be closely related to increased anxiety [40].

Discussion

MBI have had positive outcomes in improving mental health symptoms in adults including depression, anxiety, pain, fatigue and psychological distress. Studies in the child and adolescent population have also shown promising outcomes but most studies have several limitations due to low subject enrollment, lack of control groups or lacking measuring effectiveness for individual anxiety disorders. These initial results are reassuring about using MBI in this population as they have no known side effects, brief time limited sessions and are noninvasive approaches which are also predicted to synchronize brain wave changes and can have lasting effects. Further studies need to be completed to verify sustained

neurophysiological changes and corroborating those changes with continued improvement in mood, anxiety, inattention and PTSD in the long term.

Conclusion

Early studies on MBI in adults have shown promising results in improving mental health symptoms including anxiety, stress, and depressive symptoms. Mindfulness based interventions can be positive psychotherapeutic tools in children and adolescents for various mental health disorders. Some studies which were done in children and adolescent population have had mixed results, but their sample sizes were fairly small. Long term measures of MBI have found continued effectiveness in few studies done on adults but results yet need to be replicated in children and adolescents. More robust studies are needed to verify effectiveness of these approaches. MBI is further branching to more specialized treatment approaches to develop symptom specific models. There is evidence suggesting that there could be corresponding changes in brain with improvement in self- reported measures using MBI. Effectiveness of these psychotherapeutic approaches should also be compared with and without medications in long term. This will provide more guidance, if combined approach has more advantages similar to Cognitive Behavioral Therapy (CBT) and medications or if it can also be used as a standalone treatment approaches with similar efficacy.

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