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Efficacy of Mindfulness on Stress and Anxiety in Adolescents: A Systematic Review

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Efficacy of Mindfulness on Stress and Anxiety in Adolescents: A Systematic Review

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EFFICACY OF MINDFULNESS ON STESS, AND ANXIETY IN ADOLESCENTS: A SYSTEMATIC REVIEW

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Table of Contents

LIST OF TABLES

EFFICACY OF MINDFULNESS ON STRESS AND ANXIETY IN ADOLESCENTS: A SYSTEMATIC REVIEW

Callimarie Bell April 2019 45 Pages

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Most mental health problems begin early in life, with 50% of all problems beginning by the age of 14. Thus, adolescents are a vulnerable population and factors impacting their mental health should be examined. One factor is stress. Stress has been linked to both mental and physical health problems, depression, and anxiety. Anxiety disorders are the most prevalent mental health problem among adolescents. A potential treatment is that of mindfulness. Mindfulness originated from Buddhism and is the non-judgmental acceptance of thought, feelings, and experiences. Mindfulness has been found to reduce symptoms of stress and anxiety, alleviate chronic pain, and reduce relapse in depression in adult populations. Four out of five studies on Mindfulness-Based Stress Reduction (MBSR) found that mindfulness reduces symptoms of anxiety in adolescents. Only two of the five MBSR studies found a significant reduction in stress. Four out of five studies on mindfulness training programs also found a reduction in anxiety symptoms. Only one of the five mindfulness training programs found a significant decrease in stress. These findings suggest that mindfulness is effective in adolescents with anxiety but perhaps not for stress. Mindfulness also promotes the development of coping skills. There is limited research on mindfulness and adolescents. Therefore, conclusions are preliminary, and more research is needed to examine the effect of mindfulness on stress, anxiety, and coping skills in adolescents. Overall, mindfulness-based treatments appear to be effective in reducing anxiety in adolescents.

Research supports the use of mindfulness as an adjunct to treatment. For clinicians who are considering its use, there are online MBSR and MBCT training courses.

Introduction

Most mental health problems begin early in life, with 50% of all problems beginning by the age of 14 (Merikangas et al., 2010). Moreover, one in five adolescents develops serious mental health issues (Ahrnsbrak, Bose, Hedden, Lipari, & Park-Lee, 2017). Early intervention can help lessen the impact of mental health problems later in life (Stein et al., 2003). To make early identification possible, factors that contribute to poor mental health among adolescents should be identified. Furthermore, for those already experiencing symptoms, potential treatment methods should be explored.

One factor that needs to be examined is stress. A recent poll conducted by the American Psychological Association (Anderson et al., 2014) found that stress levels in adolescents are comparable to levels in adults. In the poll, adolescents reported their stress levels to be 5.8 on a scale ranging from 1 (*no stress at all*) to 10 (*a great deal of stress*) compared to 5.1 for adults (Anderson et al., 2014). Stress has been linked to both mental and physical health problems (Marksberry, 2019). It has been linked to the onset of depression (Hammen, 2005; Kendler, Karkowski, & Prescott, 1999) and anxiety disorders (Faravelli & Pallanti, 1989). Among adolescents. both depression and anxiety disorders are common mental health problems (Merikanagas et al., 2010; Perou et al., 2013). Anxiety is the more prevalent of the two, present in 31.9 percent of the population and depression present in 12.8 percent (Merikangas et al., 2010; Perou et al., 2013).

Thus, stress or stressful life events are potentially a threat to the well-being and mental health of adolescents. Adolescents are faced with a variety of stressful life events including acute traumatic events, chronic strain and adversity, and the accumulation of stressful life events and

daily hassles (Haggerty, Sherrod, Garmezy, & Rutter, 1994). Given the link between stress, depression, and anxiety disorders, an approach aimed at alleviating stress would be useful in the treatment or prevention of adolescent mental health problems. One such approach is mindfulness.

Mindfulness

Mindfulness has origins in Buddhism. The term itself is a translation of the Pali word *Sati,* the ability to remember (Bhikku, 1996). *Sati* is one of four components that make up *Satipatthanas* or mindfulness. The second component is *Sampalanna* or alertness. In Buddhism, this refers to an awareness of the body and mind, particularly the movements of the body and mind (Bhikku, 1996). The third component is *Atappa* or ardency. It refers to focusing and skillfully approaching the task at hand (Bhikku, 1996). The final component of mindfulness is *yoniso manisikara* or appropriate attention. This component refers to the comprehension of suffering, detaching from the source, and developing a solution (Bhikku, 1996).

In modern Western psychology, mindfulness has varying definitions. One such definition is similar to the Buddhist component of appropriate attention. It is defined as awareness gained from paying purposeful *non-judgmental attention* to the present moment (Kabat-Zinn, 2003). Another describes mindfulness as the *regulation of attention* in the present moment with an orientation characterized by openness, curiosity, and acceptance (Bishop et al., 2004). Both definitions share the core elements of attention and focus on the present, thus there appear to be underlying themes across these definitions.

Nilsson and Kazemi (2016) identified five themes or core elements from varying definitions of mindfulness; attention and awareness; present-centeredness; external events;

cultivation; and ethical mindedness. Attention refers to receptiveness and awareness of monitoring responses to external stimuli. Present-centeredness refers to being present in the moment. External events are environmental stimuli upon which we have no control. Cultivation refers to developing adaptive healthy skills to counteract negative experiences. Last, ethical-mindedness focuses on the social aspect of mindfulness. The concept of ethical-mindedness bridges the gap between western and Buddhist ideals of mindfulness. Mindfulness as a social practice encourages the development of a socially concerned mindfulness instead of one focused on self-improvement (Nilsson & Kazemi, 2016). There is not currently a single operational definition of mindfulness the various definitions seem to have these five qualities in common.

Mindfulness-Based Treatment Approaches

Over the past 30 years, psychology has seen an increased interest in the use of mindfulness. The practice of mindfulness has been found to help with overall psychological well-being (Brown & Ryan, 2003). When combined with other techniques mindfulness has been demonstrated to be useful in helping prevent relapse in individuals with depression (Teasdale et al., 2000) and in alleviating chronic pain (Kabat-Zinn,1990). Several mindfulness-based approaches have been developed. The predominant ones are mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), dialectic behavior therapy (DBT), and acceptance and commitment therapy (ACT; Burke, 2009). These approaches are briefly described in the following sections. Mindfulness-Based Stress Reduction (MBSR)

Mindfulness-based stress reduction was developed by Kabat-Zinn (1990) to help patients with chronic pain. It is an eight-week program that consists of mindfulness meditation as a self-regulation approach to stress reduction and emotion management

(Kabat-Zinn, 1990). In this approach, mindfulness is defined as a moment to moment, non-judgmental awareness. MBSR is a useful approach for the reduction of symptoms of stress, anxiety, and depression as well as overall mental health in adult populations (Nyklicek & Kuijpers, 2008; Shapiro, Schwartz, & Bonner, 1998; Speca, Carlson, Goodey, & Angen, 2000). Most of the research examining stress and anxiety in adolescents reviews this approach.

Mindfulness-Based Cognitive Therapy (MBCT)

Mindfulness-based cognitive therapy is derived from MBSR. It combines elements of cognitive behavioral therapy with meditation techniques (Segal, Williams, & Teasdale, 2002; Teasdale et al., 2000). The goal of MCBT is to teach patients to relate differently to their thoughts, feelings, and bodily sensations. That is, unlike traditional CBT the goal is not to change maladaptive thought but to experience them with an open acceptance without trying to change them. Part of this is recognizing that thoughts come and go, and that one can choose to engage or not to engage them (Segal et al., 2002; Teasdale et al., 2000). This approach is mostly used when examining depression, and few examine it regarding stress and anxiety.

Dialectical Behavioral Therapy (DBT)

Dialectical behavioral therapy is a comprehensive cognitive-behavioral treatment that focuses on problem-solving and acceptance. DBT is used to treat complex mental disorders (Linehan, Heard, & Armstrong, 1993). It consists of five components: capability enhancement (enhances four basic skills: mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness), generalization (training skills apply to all settings), motivational enhancement (individualized treatment plans), structuring of the environment (reinforcing positive skills and behaviors across all settings), and capability and motivational enhancement of therapists

(provides support for therapist and enhances motivation and capacity to provide effective treatment; Dimeff & Linehan, 2001).

Acceptance and Commitment Therapy (ACT)

Acceptance and commitment therapy increases psychological flexibility. Psychological flexibility is the process of being present in the moment and adjusting behavior in accordance with chosen values (Hayes et al., 2006). It consists of six core processes: acceptance, being present or mindfulness, valued directions, committed action, self-as-context, and cognitive defusion. Acceptance is the active embracing of experiences without attempting to change them. Being present, or mindfulness, is non-judgmental contact with internal and external events as they occur. Valued directions are desired qualities that give life meaning (the kind of person you desire to be or things you want to do; Harris, 2007; Hayes et al., 2006). On the other hand, committed actions are concrete goals consistent with chosen values that can be achieved. Self-as-context is the standpoint that one can be aware of ones' experiences without being attached to them. Last, cognitive defusion is the process of viewing thoughts as thoughts and not truths (Hayes et al., 2006).

Current Project

Note both MBSR and MBCT use regular mindfulness meditation practices and DBT and ACT teach non-meditative elements of mindfulness. However, DBT and ACT were not reviewed due to the lack of research examining anxiety in adolescents. The purpose of this project was to evaluate whether using mindfulness aids in the treatment of adolescents with anxiety impacted by stress. It examined the effectiveness of mindfulness in the reduction of stress and anxiety symptoms for adolescents.

Method

The current project performed a comprehensive literature review from the year 1989 to 2018. Studies were identified by searching the following databases: PsycINFO, Social Sciences Full Text, PsycARTICLES, Psychology and Behavioral Science Collection, MEDLINE, and Google Scholar. Search results initially yielded over 56,000 results. Search terms included mindfulness, stress, anxiety, and adolescents. Terms were entered into the search engines in the following combinations: mindfulness, stress, adolescents; mindfulness, anxiety, adolescents; and mindfulness, stress, anxiety, and adolescents. Given that the primary goal was to examine the efficacy of mindfulness on stress and anxiety in adolescents, initially, only Randomized Controlled Trials were included. However, due to a limited number of RCTs, quasi-experiments were included if they used a control group. After eliminating duplicate studies, studies not peer-reviewed, and studies irrelevant to the research question a total of 10 studies (9 RCTs and 1 quasi-experiment) were included in the review. Five of the RCTs examined MBSR, four RCTs examined mindfulness training programs and one quasi-experiment examined a mindfulness training program.

Results

Efficacy of MBSR

Among the reviewed studies, five examined the efficacy of MBSR with adolescents. The first study conducted by Biegel, Brown, Shapiro, and Schubert (2009) examined the effectiveness of an MBSR program for adolescents aged 14 to18 with varied diagnoses. The participants were adolescents currently receiving treatment or who had received psychiatric treatment. Adolescents were excluded if they had past or present psychiatric or neurological disorders that would limit participation in the study (i.e., suicidal, organic brain syndrome,

significant cognitive impairment, or current substance abuse; Biegel et al., 2009). A total of 104 adolescents were eligible, 102 (male *n*=27, female *n*=75) participated in the study, and 74 completed all the assessments. Participants were randomly assigned to either the experimental (MBSR plus TAU) group (*n*=50) or the control (treatment as usual, TAU) group (*n*=52). They completed a pretest, posttest, and three- month follow up assessment. Those in the MBSR group received MBSR in addition to regular treatment (Biegel et al., 2009).

The MBSR intervention consisted of eight weekly 2-hour sessions that focused on formal and informal mindfulness practices. Specifically, participants were encouraged to focus on three elements (intention, attention, and attitude; Biegel et al., 2009). Participants were also trained in body scan meditation, sitting meditation, hatha yoga, and walking meditation. The sessions also included instruction in at-home mindfulness practice, group sharing of experiences, and didactic presentations (Biegel et al., 2009). Those in the control group continued to receive their usual treatment (psychotherapy and/or medication).

Information about the participants' psychiatric diagnosis and level of general psychological and social functioning (Diagnostic and Statistical Manual of Mental Disorders 4th ed.; DSM–IV-TR; Axis V: Global Assessment of Functioning (GAF); American Psychiatric Association, 2000) was obtained from institution records (Biegel et al., 2009). Psychological stress, distress, and well-being were measured using the Perceived Stress Scale (PSS-10; Cohen & Williamson, 1988); the Hopkins Symptoms Checklist-90-Revised (SCL-90-R; Derogatis, 1977); and the Rosenberg Self-Esteem Scale (SES; Rosenberg, 1989; Biegel et al., 2009). As part of the posttest assessment,

participants were asked about their perception of the program, benefits of the program, and suggestions for improvement.

Biegel and her colleagues (2009) found that the MBSR group experienced a significant reduction of self-reported anxiety (*d*=.66), depressive (*d*=.95), and somatization (*d*=.80) symptoms. There were significant declines in perceived stress (*d*=.89), obsessive symptoms (*d*=1.11), and interpersonal problems (*d*=.82) compared to the control. The MBSR group was more likely to show diagnostic improvement (β= .57, p<.001). Fifty-four percent of the MBSR group showed improvement compared to 1% of those in the control group (Biegel et al., 2009). Biegel and her colleagues (2009) also found that the MBSR group had significant increases in GAF scores and a higher percentage (45%) of mental health changes than the control group (2.2%) [F (10,84) = 8.76, p<.0001, R^2= .54 (β= .57, p<.0001)]. These results support that mindfulness is effective in the reduction of anxiety symptoms and stress in adolescents. Moreover, these results suggest that MBSR is a beneficial adjunct to treatment.

The next study by Díaz-González, Dueñas, Sánchez-Raya, Elvira, and Vazquez (2018) also examined the effect of an MBSR as an adjunct to treatment in adolescents. They evaluated the effect of an MBSR intervention across several variables: mindfulness, anxiety, perceived stress, self-esteem, and psychological symptoms. Participants were 80 adolescents (male *n*= 36, female *n*=44) ages 13 to 16 receiving psychiatric or psychological treatment in outpatient mental health clinics. Adolescents were excluded if they had a significant cognitive impairment, severe brain injuries, psychotic disorders, were currently suicidal, or had current substance abuse problems.

Participants were randomly assigned to either the treatment condition (MBSR plus treatment as usual) or the control (treatment as usual) condition (Díaz-González et al., 2018).

Those in the MBSR condition had eight 90-minute weekly sessions. The sessions consisted of formal practice (body scan, yoga exercise, and meditation) lasting from 10 to 20 minutes. Participants were also encouraged to practice at home for 25 to 30 minutes as well and well give short homework assignments (Díaz-González et al., 2018). Participants completed assessments on: mindfulness (using the Mindful Attention Awareness Scale for Adolescents; Brown, West, Loverich, & Biegel, 2011), self-esteem (using the SES; Rosenberg, 1965), perceived stress (using the Perceived Stress Scale; Cohen, Kamarck, & Mermelstein, 1983), state-trait anxiety (using the State-Trait Anxiety Inventory for Children (STAI-C; Spielberger, 1973 and STAI; Spielberger, 1983), and psychological symptoms (the SCL-90-R; Derogatis, 1994).

Díaz-González et al., (2018) found a significant decrease in state (M=53.87, SD=33.36) for the MBSR group compared to the control [M=67.05, SD=32.15, (F (1,77) =2.79, MSE=2049.06, d=.42 p<.05)]. They did not find any other significant differences. The results were consistent with the previous study (Biegel et al., 2009) in that there was a significant reduction in anxiety symptoms. Specifically, there was a reduction in state anxiety symptoms. State anxiety refers to the unpleasant feelings and sensations one experiences when faced with a perceived threating situation. The decrease in state anxiety suggests that the participant's coping skills improved as they perceived fewer situations as threating. This suggests that mindfulness contributed to the improvement of coping skills.

Like the previous studies, Vohra et al. (2019) also examined the efficacy of MBSR as an addition to usual treatment. Specifically, they examined if MBSR helped reduce mental health symptoms and increased coping/resiliency. Participants were 12 to 18 year-old residents (n= 81, 48 males and 33 females) of a voluntary residential

treatment program who required more intensive treatment. Participants were primarily diagnosed with mood disorders, attention-deficit/ hyperactivity disorder (ADHD), or other psychological disorders. Participants were excluded if they had a psychosis diagnosis (Vohra et al., 2019). A total of 85 residents were eligible to participate in the study. However, five participants dropped out of the study (4 MBSR and 1 Control) due to being discharged or transferred from the treatment facility. A total of 81 participants were included in the analysis. One of the participants chose not to participate in the study (Vohra et al., 2019).

Participants were randomly assigned into either the control group (usual care, *n*= 39, 25 males and 14 females) or the experimental group (MBSR plus usual care, *n*= 42, 23 males and 19 females). The control group received therapies and programs already used at the facility which consisted of: daily group therapy, medications, tutoring by public school teachers, physical education and recreation, and weekly family therapy sessions (Vohra et al., 2019). Participants in the MBSR group received eight sessions of MBSR plus one three-hour retreat at the end of the eight sessions to review their experiences with mindfulness (Vohra et al., 2019). The MBSR group were given homework that focused on concrete experiential tasks. The MBSR sessions were administered by a qualified MBSR instructor.

Vohra et al. (2019) examined the effect of MBSR on emotions and behavior using the Behavior Assessment System for Children-Second Edition (BASC-2; Reynolds & Kamphaus, 2004). The BASC-2 is a multidimensional system used to evaluate the behavior and self-perceptions of children by assessing adaptive skills, problem behaviors, school problems, and peer relations (Reynolds & Kamphaus, 2004). The effect of mindfulness was measured by the Child Acceptance and Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011). Vohra et al. (2019) also examined stress measured by the Perceived Stress Scale (PSS; Cohen, Kamarck, &

Mermelstein, 1983), and emotion regulation measured by the revised Emotional Regulation Questionnaire (ERQ; Gross & John, 2003). All questionnaires were administered before and after a 10-week session and at a three-month mark. A linear mixed model was used to analyze results (Vohra et al., 2019).

They found a significant difference between groups on the TRS-Internalizing Problems subscale of the BASC-2 and the TRS-Adaptive Skills subscale. The MBSR group had a significant decrease of internalizing problems (anxiety, depression, and somatization) (β = 11.77, p <.05) and an increase in adaptive skills (β = -5.87, p< .05) compared to the control group. There were no significant differences found in stress, mindfulness, emotion regulation or behavioral problems. There was a significant decrease in admission time for the MBSR group (150.6 to 132.8 days from admission to discharge, p= .02). The results from this study are somewhat mixed in how they compare to those found in adults. There was not a significant improvement in stress, which differs from the previous study (Biegal et al., 2009) which found that MBSR reduces stress. There was a significant improvement in internalizing symptoms (anxiety, depression, and somatization) and adaptive skills. This suggests that MBSR does improve anxiety and increase coping skills in adolescents. However, this improvement was only significant on the teacher rating scale of the BASC-2. So, the adolescents themselves did not report a significant improvement. Therefore, the results are not as generalizable as those in the previous studies (Biegel et al., 2009, & Díaz-González et al., 2018).

The previous studies examined MBSR as an adjunct to treatment. This next study by Freedenberg, Hinds, and Friedmann (2017) studied MSBR by itself. They examined the effectiveness of MBSR in reducing anxiety, depression, and stress in adolescents with

cardiac diagnoses. This study also examined the association between use of coping strategies (cognitive restructuring, acceptance, positive thinking, and distraction) taught in the MBSR intervention and the outcomes of anxiety and depression. A total of 46 adolescents ages 12 to 18 participated in the study. Participants were included if they had 1 of 2 diagnoses either a) congenital heart disease or a cardiac device (52%), or b) postural orthostatic tachycardia syndrome (48%). Participants were excluded if they or their caregiver were not fluent in English, they were unable to complete study measures, or they lacked access to Skype (Freedenberg et al., 2017).

Participants were randomly assigned to either the MBSR group (male *n*=8, female *n*=18) or the (control) online video support group (male *n*= 9, female *n*= 11). The MBSR group consisted of six-weekly 90-minute sessions (Freedenberg et al., 2017). The sessions consisted of training in deep breathing exercises, meditation, and yoga. During the sessions, the MBSR group discussed stressors and fears related to their illness and their behavioral responses to these fears. The MBSR group also cultivated awareness of stress-related symptoms and used mindfulness techniques and cognitive restructuring to alleviate symptoms (Freedenberg et al., 2017). The MBSR group was given homework assignments each week. The video support group met for six weekly 1-hour sessions via Skype after school during which groups discussed questions or topics about health and or cardiac issues based on requests.

Participants in the MBSR and video support group completed self-report measures on anxiety, coping, and depression pre and post the six-week intervention (Freedenberg et al., 2017). The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to assess anxiety and depression. The Responses to Stress Questionnaire (RSQ; Connor-Smith, Compas, & Wadsworth, 2000) was used to assess illness-related stress and coping. Participants

also completed a qualitative interview at the end of the last session to gauge their perception of the study. Participants also had an opportunity to make suggestions for a future program.

The study did not find a significant difference between treatment groups. Anxiety and depression scores did not significantly change from pre to post [Anxiety: t (45) = 1.156, p = .254 Depression: [t (45) = 1.205, p = .459] and there was not a difference between groups [Anxiety: F (1,44) = .109, p = .743 Depression: [F (1,44) = 2.556, p = .117]. However, there was a significant decrease in illness-related stress in both groups [t (44) = 3.718, p = .001]. The pre–post by group interaction revealed that stress decreased significantly from before (M = 26.8, SD = 9.7) to after both the MBSR and video interventions [M = 23.2, SD = 7.8; F (1,43) = 13.941, p = .001]. The study also found that greater use of coping skills predicted lower levels of depression in both groups (r = -.30, p = .04). Furthermore, higher baseline anxiety/depression scores predicted improved anxiety/depression scores in both groups (r = .43, p = .01). Both groups reported the benefits of social support, and the MBSR group also reported learning techniques that applied to real-life situations to alleviate distress (Freedenberg et al., 2017). Overall, the study by Freedenberg et al. (2017) did not find any significant difference between groups. However, there was a significant reduction in stress in both groups. This suggests that while MBSR is effective in stress reduction it may not be better than other treatment methods. One thing to note is that the qualitative data indicated that teaching mindfulness techniques may improve clinical outcomes as these are skills that can be used over one's lifetime to manage both chronic and daily stress.

Like the previous study, Sibinga et al. (2013) also examined MBSR by itself. They examined the effectiveness of MBSR in alleviating psychological symptoms and enhancing coping among urban youths. The participants were 41 seventh and eighth-grade males from an urban middle school. Students were excluded if they were in foster care, had significant psychopathology, developmental delay, substance abuse, or behavioral problems (Sibinga et al., 2013). Students were randomly assigned to MBSR or an active control program (healthy topics). Both programs were incorporated into the school day and consisted of 12 weekly 50-minute sessions. Those in the MBSR group received instruction in mindfulness and those in the control group participated in a health education program. Data were collected at baseline, posttest (within two weeks), and at three months follow up (Sibinga et al., 2013).

Anxiety was measured using the symptoms checklist-90R (Derogatis, 1994) and the Multidimensional Anxiety Scale for Children (March, Sullivan, & Parker, 1999). They also used the State-Trait Anger Expression Inventory (Forgays, Forgays, & Spielberger, 1997) and the Child Depression Inventory Short Form (Kovacs, 1992) to measure psychological functioning (Sibinga et al., 2013). Coping was measured using the Brief COPE (Carver, 1997). Sleep was measured using sleep diaries and a Respironics Mini Mitter Actiwatch. Cortisol stress response was assessed by collecting two successive days of salivary cortisol (Sibinga et al., 2013).

Forty-one students participated in the 12-week study. The authors (Sibinga et al., 2013) did not provide R^2, only *p* values and a full model with *Cohen's d.* Those in the MBSR group had less anxiety (β=-3.74, d=0.79, p=0.01) and less rumination (β=-5.32, d=0.64, p=0.02; Sibinga et al., 2013) They also found that for the MBSR group the act with awareness mindfulness subscale was associated with lower anxiety (β=1.68, d=-0.30, p<0.01) while all of the mindfulness subscales were associated with less self-reported anger (β=1.58, d=-0.66,

p<0.02), and less anger reactivity (β=0.83, d=-0.03, p=0.05). There was no significant difference between groups for cortisol output. In both groups, the cortisol output (β=-1.28, d=0.05, p=0.05) was higher post-program (Sibinga et al., 2013). However, the MBSR group had a smaller increase (128.3 to 138.5) compared to the control group (113.6 to 167.5; Sibinga et al., 2013). The research by Sibinga and colleagues (2013) seems to provide support for the usefulness of mindfulness in decreasing anxiety symptoms in adolescents. However, unlike the previous study (Freedenberg et al., 2017) there was not a significant decrease in stress. This study had a few limitations (small N for the number of variables and use of change scores) thus the results should be viewed with caution.

In general, the studies in this section on Mindfulness-Based Stress Reduction provide support for the effectiveness of mindfulness with adolescents. This section mainly examined the efficacy of MBSR with adolescents (Biegel et al., 2009; Diaz et al., 2018; Freedenberg et al., 2017; Sibinga et al., 2013; Vohra et al., 2019). Several of the studies provided evidence that MBSR is effective in the reduction of stress and anxiety symptoms in adolescents (Biegel et al., 2009; Diaz et al., 2018; Freedenberg et al., 2017; & Sibinga et al., 2013). Two of the studies found that MBSR aids in the improvement of coping skills (Biegel et al., 2009; Vohra et al., 2019) in adolescents. MBSR is an adult treatment a program, which the previous studies (Biegel et al.,2009; Diaz et al., 2018; Freedenberg et al.,2017; Sibinga et al., 2013; & Vohra et al., 2019) adapted to use with adolescents. One of the predominant mindfulness-based approaches is MBSR although, it is not the only approach. Other studies, reviewed in the section to follow, have adapted mindfulness practices and techniques into training programs for adolescents.

Efficacy of Mindfulness Training Programs

While the previous studies used an established mindfulness-based approach, the following studies do not. Instead, they used mindfulness programs specifically adapted for adolescents. Like the studies on MBSR, Himelstein, Saul, and Garcia-Romeu (2015) examined a mindfulness training program as an adjunct to treatment. They examined whether the addition of mindfulness meditation increases the effectiveness of substance abuse treatment with incarcerated youths. Participants were recruited from a court-mandated substance abuse group program. There was a total of 35 male (70% Latino) adolescents aged 14 to 18, of which 27 completed the assessment (Himelstein et al., 2015). Adolescents were excluded if they were not mandated to a substance abuse program. Participants displayed a variety of diagnoses for mental health disorders including PTSD, other anxiety disorders, ADHD, learning disorders, adjustment disorders and mood disorders (Himelstein et al., 2015). Participants were randomly assigned to either the experimental (psychotherapy plus mindfulness meditation) or the control (treatment as usual, psychotherapy only) groups (Himelstein et al., 2015). The experimental group received training in mindfulness meditation in addition to psychotherapy for 8 to 12 weeks with meditation time ranging from 5 to 25 minutes. They were taught deep breathing, mindfulness of the breath, the body scan, a non-moving body scan, counting meditation, and informal mindfulness techniques in the first six sessions (Himelstein et al., 2015). They were encouraged to choose a meditation technique to practice and to meditate between weekly sessions using the said technique. The control group received 8 to 12 weekly sessions of individual psychotherapy. For both groups the sessions lasted 45 to 60 minutes. The study lasted 12 weeks and only those who completed at least 8 weeks were included in the analysis.

Prior to and after treatment, participants completed five self-report measures of mindfulness, locus of control, decision-making, self-esteem, and attitude toward drugs (Himelstein et al., 2015). These were measured by the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Prison Locus of Control Scale (PLOCS; Pugh, 1992), Decision-Making Skills (DMS; Hansen, 1996), the Rosenberg Self-Esteem Scale (SES; Rosenberg, 1989), and the Monitoring the Future Questionnaire (MTF; Johnston, O'Malley, & Bachman, 1991). The staff also rated the participants' behavior each week and means were calculated before and after the intervention. Behavioral points were given for good behavior during school time, recreation, and structured activities. Daily points were averaged at the end of each week (Himelstein et al., 2015).

Himelstein and his colleagues (2015) did not find a significant difference in mindfulness awareness scale in the experimental group. The study found a significant difference between the experimental and control groups on self-esteem. Those in the experimental group had a greater increase in self-esteem (*M* change = 2.30) than those in the control group [(*M* change = 0.07), t (26) =2.119, $p<0.05$].

While this study (Himelstein et al., 2015) did not examine the effect of mindfulness on stress and anxiety, they examined the effect of mindfulness on mindful awareness but did not find a significant change. This suggest that the mindfulness intervention was not effective. However, this lack of significance could be attributed to the mindfulness intervention being administered in an individual setting instead of a group. Furthermore, unlike the previous studies (Biegel et al., 2009; Diaz et al., 2018; Freedenberg et al., 2017; Sibinga et al., 2013; Vohra et al., 2019) at-home practice was only encouraged not required. Himelstein and his colleagues (2015) suggested that the

MAAS was not a good measure to use with an incarcerated population. They suggest that the MAAS did not properly account for the trauma experienced in this population. However, there was an increase in self-esteem in the experimental group. This suggests that mindfulness did have some effect and that mindfulness may be more effective in improving self-esteem than psychotherapy alone. However, change scores are unreliable and more research is needed to determine the effects of mindfulness on self-esteem.

Like the prior study (Himelstein et al., 2015), Tan and Martin (2014) examined mindfulness as an adjunct to usual treatment. Specifically, they examined the effectiveness of a mindfulness-based intervention for adolescents with mental health problems. The participants were 108 adolescents aged 13-18, recruited from mental health clinics. Adolescents were included if they had a psychiatric diagnosis and excluded if they had prior mindfulness training, an intellectual impairment, organic brain syndromes, a substance abuse problem, suicidality, or psychosis (Tan & Martin, 2014). They were randomly assigned to either the mindfulness group or the control group. Adolescents in the mindfulness group received mindfulness training in addition to the usual treatment. The mindfulness condition was given homework assignments to complete as part of the training. Those in the control group received their usual treatment (medication, family therapy, expressive play therapy, and cognitive-behavioral therapy). Participants completed the following measures: the DASS-21(assessed mental distress; Lovibond & Lovibond, 1995); the SES (assessed self-esteem; Rosenberg, 1965); the Resiliency Scale for Children and Adolescents (RSCA; assessed optimism, self-efficacy, and adaptability; Prince-Embury, 2006); the Avoidance and Fusion Questionnaire for Youth (AFQ-Y8; assessed psychological inflexibility characterized by high levels of avoidance; Greco, Lambert, & Baer, 2008); the Children's Acceptance and Mindfulness Measure (CAMM; assessed mindfulness;

Greco, Smith, & Baer, 2011); and the CBCL (assessed behavioral problems; Achenbach, 1991). Data were collected at baseline, post-intervention and at a three-month follow up (Tan & Martin, 2014).

The researchers found that the mindfulness group showed significant improvement in mental health reporting lower total scores on the DASS-21 (Lovibond & Lovibond, 1995) compared to the control group (F (1,78) = 4.64, p = .034, n_p^2 = .06). At post-intervention the mindfulness group reported a significant decrease in mental distress (F (1,78) =5.93, p=.017, n_p^2=.08, Cohen's d=0.43) and this improvement increased at the three-month follow up (F (1,78) = 16.51, p<.001, n_p^2=.18, Cohen's d=0.78). In addition, the mindfulness group achieved significantly higher scores on the CAMM (Greco et al., 2011) for mindfulness (F (1,78) =5.53, p=.026, n_p^2=.06), and the SES (Rosenberg, 1965) for self-esteem (F (1,78) =6.92, p=.01, n_p^2=.08). The mindfulness groups showed significant improvement on the AFQ-Y8 for psychological inflexibility (F (1,78) =3.97, p=.05, n_p^2=.05). The improvement in psychological inflexibility was maintained at the three-month follow-up (F (1,78) = 18.73, p < .001, n_p^2 = .19). The parents/caregivers also reported significant improvement in their teens' psychological functioning on the CBCL (F (1,78) =11.71, p=.001, n_p^2=.13; Tan & Martin, 2014). Again, the improvement in psychological functioning was maintained at the three-month follow-up (F (1,78) = 10.84, p = .001, n_p^2 = .12). Tan and Martin (2014) also found that mindfulness mediated the relationship between the treatment group and mental health improvement (β= -.42, p<.001). That is, mindfulness accounted for the differences between the mental health improvement in each group.

These findings (Tan & Martin, 2014) suggest that mindfulness helps with stress reduction and anxiety. However, the degree to which anxiety symptoms were reduced is unknown due to anxiety being measured as a part of mental health and not individually. The changes also appear to be lasting as they persisted at the three-month follow-up. This study adds to the evidence that mindfulness aids in the development of coping skills, given that psychological inflexibility improved. These results further support that mindfulness is a good adjunct to usual treatment.

The two prior studies (Himelstein et al., 2015; Tan & Martin, 2014) examined a mindfulness training program as an addition to treatment. The next study examined the effectiveness of a mindfulness training program by itself. Franco, Mañas, Cangas, and Gallego (2010) examined whether mindfulness is effective in decreasing levels of anxiety, improving academic performance, and improving self-concept in adolescents. The participants were year one secondary students (first-year high school students) aged 16-18. There were a total of 60 participants (31 male and 29 females). Students were excluded if they had prior experience with relaxation techniques (Franco et al., 2010). Academic performance was measured using the grades from required classes (Spanish language and literature, foreign language and philosophy) taken by all students. Self-concept was measured using the *Cuestionario de Autoconcepto* (Self-Concept Questionnaire, Form A, SCQ-A; Musitu, Garcia, & Gutiérrez, 1994). The Spanish version of the State-Trait Anxiety Inventory was used to measure anxiety.

Students were randomly assigned to either the control group (*n=30)* or the meditation group (*n*=30*)*. Once assigned, students completed the pre-test evaluation of self-concept and anxiety using the STAI and SCQ-A (Franco et al., 2010). Grades were collected for the first quarter to obtain an academic performance score. The control group was told the program began in three months and the mindfulness group began the meditation program. Those in the

mindfulness group met once a week in 90 minute sessions for 10 weeks (Franco et al., 2010). During the program, participants learned a mindfulness technique called *Meditación Fluir* and practiced daily for 30 minutes. In addition, a variety of ACT metaphors and exercises, tales from the Zen Tradition and the *Vipassana* meditation were used (Franco et al., 2010). At the end of the program, data were collected again using the STAI and SCQ.

Franco et al. (2010) found significant differences between groups on all variables. They found that mindfulness reduced anxiety, improved grade performance and improved self-concept. State Anxiety (t=3.22, d=.43 p<.005) and trait anxiety (t=3.14, d=.84 p<.005) significantly decreased in the mindfulness group. The mindfulness group also displayed improvement in total academic performance (t=3.62, d=1.57 p=.001) and each subject: philosophy (t=2.71, d=1.03, p=.01), Spanish language and literature (t=2.51, d=1.85, p<.05), and foreign language (t=3.02, d=.76, p<.005). The mindfulness group also showed significant improvement in total self-concept (t=10.1, d=1.63, p<.001) and all self-concept dimensions: academic (t=3.62, d=1.17 p=.001), social (t=3.97, d=.40 p=.001), emotional (t=8.73, d=1.85, p<.001) and family (t=2.72, d=.64p=.001). To summarize, there was a reduction in anxiety symptoms in the meditation group. Franco et al. (2010) also found that academic performance in all three subjects improved significantly more in the meditation group than the control. Moreover, self-concept improved for those in the meditation group. Notably, Franco et al. (2010) used a non-clinical sample. These results suggest that mindfulness could be used as a preventative measure. Overall, these results suggest that a mindfulness-based program can improve anxiety symptoms.

Unlike the previous studies, Blake et al. (2016) used a meditation program adapted from an established mindfulness-based approach (MBCT). Blake et al. (2016) examined the effect of a cognitive behavioral/ mindfulness-based intervention on sleep and mental health among at-risk adolescents. The participants were 123 adolescents ages 12-17 years with high levels of anxiety and sleeping problems, but without past or current depressive disorder, bipolar or psychotic disorder, significant head injury, current use of anxiolytic or hypnotic medication, or a poor grasp of English (Blake et al., 2016).

They were randomly assigned to either a sleep intervention group or an active control (study skills) group. The sleep intervention was based on a cognitive-behavioral approach and consisted of sleep education, sleep hygiene, stimulus control, cognitive restructuring, mindfulness, and anxiety-specific components (Blake et al., 2016). Participants met weekly for seven weeks in 90-minute group sessions, supported by a variety of psycho-educational materials. Participants were given a workbook that contained information, worksheets, and at-home assignments. After completing the sessions all participants completed the mood and sleep questionnaire packs and were then asked to wear an Actiwatch and complete a sleep diary (Blake et al., 2016). Anxiety was measured using the Spence Children's Anxiety Scale (Spence, 1998. Sleep was measured using the Pittsburgh Sleep Quality Index (Schwartz et al., 1999). A diagnostic interview was conducted using the DSM-IV-TR criteria and the Kiddie Schedule for Affective Disorders and Schizophrenia for School Aged Children-Present and Lifetime Version (Axelson, Birmahes, Zelazny, Kaufman, & Kay Gill, 2009)

Blake et al. (2016) found that the sleep intervention was associated with greater improvement in anxiety (t=2.10, p=.05), subjective sleep (t =3.30, p=.001), sleep onset latency (t=2.42, p<.01), daytime sleepiness, and objective sleep (t=3.80, p<.001). This study used a

program that consisted of mindfulness and cognitive behavioral aspects. Like the previous studies using MBSR (Biegel et al., 2009; Diaz et al., 2018; Sibinga et al., 2013; Vohra et al., 2019), the mindfulness program also reduced anxiety. This is supportive of mindfulness being effective in reducing anxiety in adolescents.

Like the previous study (Blake et al., 2016), Haydicky, Wiener, Bardal, Milligan, and Ducharme (2012) used a meditation program adapted from MBCT. They examined the effects of mindfulness training on adolescents diagnosed with a learning disorder (LD) and co-occurring mental health diagnoses. They looked at whether a 20-week MBCT and martial arts training program (MMA) improved executive functioning and decreased internalizing and externalizing problem behaviors and social problems in adolescent males. They also examined whether participants with co-occurring specific behavioral or emotional difficulties responded to mindfulness training differently (Haydicky et al., 2012).

The participants were a total of 78 males aged 12 to 18 years, previously diagnosed with LD and enrolled in or on the waitlist for the mindfulness martial arts (MMA) program. The MMA is a manualized group treatment program for adolescents. To be included they had to have an IQ of at least 80 on the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) and meet one of the following criteria: a) standard score below 90 on at least one of the core reading, written language, or mathematics subtest on the Woodcock-Johnson Tests of Achievement 3rd Edition (WJ Ach-III; Woodcock et al., 2001), or b) academic achievement at least one standard deviation below their IQ (Haydicky et al., 2012). Of the 78 participants, 49 met all the criteria. Within the sample, 47% had a diagnosis of ADHD, 8% anxiety disorder, 3%

mood disorder, 2% oppositional defiant disorder and 2% a conduct disorder (Haydicky et al., 2012).

The MMA (Badali, 2007) program lasted 20 weeks and consisted of 90-minute sessions combining elements of mindfulness, CBT and mixed martial arts training (Haydicky et al., 2012). The program was designed to decrease problematic behavior and increase self-awareness, self-control, adaptability, social skills, and self-defense skills. Due to ethical concerns, this study did not use a true random assignment; instead, a waitlist design was used (Haydicky et al., 2012). Participants in the control group were recruited from the MMA waitlist and were admitted after the experiment's phases were completed. Data were collected at three points: pretest (week 1), posttest (week 20), and during a cognitive and academic assessment (anytime between week 1 and week 20; Haydicky et al., 2012).

Haydicky et al. (2012) used the Conners scale (Conners, 1997) to measure ADHD. The Behavior Rating Inventory of Executive Function-Parent Form (Gioia, Isquith, Guy, & Kenworthy, 2000) was used to measure executive functioning. The Child Behavior Checklist (CBCL; Achenbach, 2001) was used to measure child competencies and problematic behavior. The Youth Self-Report (YSR; Achenbach, 2001) a self-report version of the CBCL, was used to measure the adolescents' own view of their competencies and problematic behavior.

Haydicky et al. (2012) found that participants with high anxiety reported less anxiety following the program (n^2=0.23, with MMA accounting for 23% of the variance). They found a significant main effect of time (F= 6.35, p=0.02, n^2=0.26). They also found a significant group x time interaction effect for CBCL oppositional defiant problems with MMA participants showing greater reductions in oppositional defiant behavior than waitlist participants (F=6.01, p=0.03, n^2=0.25; Haydicky et al., 2012). Those who had high scores on inattention (n^2= 0.18, MMA 18%

of variance) and hyperactivity (n^2= 0.39, MMA 39% of variance) improved on parent-rated social problems (Haydicky et al., 2012).

There is not an established mindfulness training program solely for adolescents and future research should develop such a manual and evaluate it on its own merits. None of the previous studies (Blake et al., 2016; Franco et al., 2010; Himelstein et al., 2015; Tan & Martin, 2014) used a manualized mindfulness program developed for adolescents. The results of this study contributed to the evidence that mindfulness reduces anxiety symptoms. However, these results are limited by the lack of randomization. The study did, however, examine the effectiveness of the MMA program which is manualized and included mindfulness components. Because participants had prior knowledge of the MMA program their responses could have been influenced by expectations about the MMA program. Future research should examine the efficacy of both manualized mindfulness training for adolescents and the mindfulness component of the MMA program using true randomized controlled studies. The MMA program should also be examined in detail to aid in the development of established separate mindfulness training program for adolescents.

Overall, the results from these mindfulness training programs suggest that mindfulness is effective in reducing anxiety in adolescents. Three of five studies found that mindfulness decreases symptoms of anxiety (Blake et al., 2016; Franco et al., 2010; Haydicky et al., 2012). One study found that mindfulness reduces distress in adolescents (Tan & Martin, 2014). These results also suggest that mindfulness has the potential to improve at least some coping skills and well-being. Furthermore, the results from the

non-clinical sample of first year high school students (Franco et al., 2010) suggest that mindfulness could possibly be used as a preventative measure in adolescents.

Discussion

The primary goal of this paper was to evaluate the effectiveness of mindfulness in stress-reduction and reduction of anxiety symptoms in adolescents. Mindfulness has been shown to be effective in reducing stress and anxiety in adult populations (Speca et al., 2000; Shapiro et al., 1998; Nyklicek & Kuijpers, 2008). However, not much research on this topic has been conducted using adolescents.

Based on the systematic review on the effectiveness of mindfulness with adolescents, several preliminary conclusions can be drawn. Four out of five studies found that MBSR improved symptoms of anxiety (Biegel et al., 2009; Diaz-González et al., 2018; Sibinga et al., 2013; & Vohra et al., 2019) and two studies found a reduction in stress (Biegel et al., 2009 & Freedenberg et al., 2017). Moreover, four out of five studies found that mindfulness training programs reduced symptoms of anxiety (Blake et al., 2016; Franco et al., 2010; Haydicky et al., 2012; & Tan & Martin, 2016). Only one of the studies on mindfulness training programs found a reduction in stress (Tan & Martin, 2016). Two out of the five studies on mindfulness training programs used a combination of CBT and mindfulness and found a reduction in anxiety symptoms (Blake et al., 2016; Haydicky et al., 2012).

Five of the reviewed studies used mindfulness as an adjunct to psychotherapy (Biegel et al., 2009; Diaz-González et al., 2018; Himelstein et al., 2015; Tan & Martin, 2016; & Vohra et al., 2019). Four out of the five found that adding mindfulness to psychotherapy reduced symptoms of anxiety (Biegel et al., 2009; Diaz-González et al., 2018; Tan & Martin, 2016; &

Vohra et al., 2019). The results from these studies suggest that mindfulness enhances psychotherapy approaches. To determine if that is the case more research is needed.

There is also preliminary evidence that mindfulness aids in the development of at least some coping skills which could potentially improve well-being (Chua, Milfont, & Jose, 2014). According to the transactional model (Lazarus & Folkman, 1987), stress is felt when one experiences a threat to their well-being and does not have an adequate coping mechanism. Therefore, increasing or strengthening ones coping skills could influence well-being. Four of the reviewed studies support that mindfulness helps with the development of real-life coping skills (meditation, exercise, talking to trusted others, encouraging others, Biegel et al., 2009; Freedenberg et al., 2017; Vohra et al., 2019). In one of the studies, participants reported learning techniques to apply in real-life situations (Freedenberg et al., 2017). One possible interpretation of this relationship is that mindfulness improves the person's perception of the situation or slows them down sufficiently so that better coping skills can be employed or learned. In turn better, coping skill leads to less experienced stress.

Limitations

As previously mentioned, there is limited research on mindfulness with adolescents. There are few randomized controlled trials and those are limited by the short follow-up durations. Among the reviewed studies the longest follow-up time was three months (Biegel et al., 2009; Sibinga et al., 2013; Tan & Martin, 2014; Vohra, 2019). A longer follow-up time would help determine if the effects are lasting. One study (Sibinga et al., 2013) suffered from a small *N* and reported change scores, which are unreliable. Therefore, the results of their study must be interpreted with caution.

Another limitation is that Kabat-Zinn (1990) recommends that instructors in mindfulness have years of personal practice with mindfulness. The reviewed studies did not indicate the level of experience the instructors had with mindfulness. However, if effects are found in participants after limited training perhaps the threshold of training needed to help clients find benefits from mindfulness is not that intense. More research is needed on what training circumstances are essential to obtain benefit from mindfulness.

The reviewed studies also did not seem to measure the completion of at-home practice, which may be a necessary part of mindfulness training (Kabat-Zinn, 1990). The assumption appears to be that mindfulness is like any other skill, the more you practice it the better you become. As you become more skilled at mindfulness the more benefits you experience. Therefore, can only practicing once a week during the group session lead to a skill level that would greatly benefit the person? This is possibly why at-home practice would be needed both during and after training. Most of the reviewed studies (Biegel et al., 2009; Blake et al., 2016; Diaz et al., 2018; Freedenberg et al., 2017; Sibinga et al., 2013; Vohra et al., 2019) included at-home practice as part of the program. In one study (Himelstein et al., 2015) the at-home practice was optional and they found an increase in mindfulness within the participants.

Future Research

Although there has been a growing interest in mindfulness, most of the research has been conducted with adults. The research using mindfulness with adolescents is lacking and more studies need to be conducted. Most of the current research using randomized controlled trials has focused on mindfulness-based stress reduction. Only two of the reviewed studies used an adaption of MBCT (Blake et al., 2016; Haydicky et al., 2012). MBCT has been effective in the prevention of relapse in adults with depression (Segal et al., 2002). However, little research had

been conducted on MBCT's effectiveness in adolescents with anxiety. Both studies found a reduction of anxiety symptoms, which suggests that MBCT may improve anxiety. However, more research is needed to determine the efficacy of MBCT with adolescents.

Given the evidence that mindfulness aids in developing coping skills, future research should explore how mindfulness influences coping skills. One possible explanation is that mindfulness focuses on developing and strengthening inner resources instead of fixing what appears to be wrong with the person. Researchers should endeavor to determine if mindfulness itself is a coping mechanism or if it strengthens or helps develop new skills as a mediator. Coping skills have been linked to well-being in adolescents (Chua, et al., 2014). Considering the potential link between coping skills and mindfulness the relationship between these three factors should be explored.

Future research should examine mindfulness as a preventative measure for adolescent anxiety. Two studies found a reduction in anxiety symptoms in non-clinical samples (Franco et al., 2010; Sibinga et al., 2013). Thus, mindfulness could be used to reduce symptoms in adolescents who are not diagnosed with a disorder but experiencing high levels of anxiety and at-risk for developing an anxiety disorder. There is not an established mindfulness training program for adolescents. Thus, researchers need to monitor the development of alternative mindfulness models for various populations including adolescents and do comparison studies.

Clinical Practice

Adolescents will experience various life stressors and daily hassles, ranging from everyday stressors (e.g., school, family, friends) to more distressing events (e.g., natural

disasters, deaths, violence). Stress can lead to poor mental and physical health (Marksberry, 2019). Mindfulness seems to be an effective treatment method for reducing stress. For clinicians considering adding mindfulness to their current methods, there are a couple of factors to consider. The recommendation by Kabat-Zin (1990) is that the clinician needs to be well-versed in mindfulness themselves before attempting to teach it. He indicates that clinicians need to experience and practice mindfulness before using it in their therapeutic sessions.

For clinicians interested in learning mindfulness, there are online training courses in MBSR and MBCT. For those interested in MBSR, there is a free 8-week self-guided course created by a fully certified MBSR instructor (https://palousemindfulness.com; Potter, n.d.). Upon completion of the course, a graduate can apply what was learned to individual and group treatment. The course does not qualify the clinician to teach the complete 8-week MBSR program. To become a certified MBSR instructor Kabat-Zin indicates that training through the University of Massachusetts Medical School is necessary (University of Massachusetts Medical School, 2016).

According to the University of California, San Diego, Center for Mindfulness clinicians must obtain teacher qualification status (http://mbpti.org/) to establish a basic level of proficiency to offer MBCT to clients. This requires: a.) completion of a 5-day professional training retreat, b.) completion of an online professional training course or participation in an 8-week MBCT group, c.) applying to the University of California, San Diego, Mindfulness-Based Professional Training Institute (MBPTI) as a Teacher in Training (application fee of $200 plus mentorship administration fee of $200) and completion of 20 hours of mentorship while teaching two 8-week courses. Finally, d.) the candidate can apply for teacher qualification status ($750 application fee). For clinicians not interested in completing a training program there are books

(e.g. Altman, 2014; Burdick, 2013; Segal, Williams, Teasdale, & Kabat-Zinn, 2018; Teasdale, Williams, & Segal, 2014; Wolf & Serpa, 2015), and online guided audio sessions (www.mindful.org) available.

There is not an established mindfulness training program for adolescents. Thus, clinicians should investigate the development of one. In developing a mindfulness training program for adolescents, clinicians need to consider age-related developmental needs (attention span, physicality, language, cognitive capacities, and relevant content).

Adult mindfulness programs require 30 minutes of daily meditation practice. Considering the attention span of adolescents, it may be difficult to get them to sit still and meditate for 30 minutes. Given that the goal of meditation is to reach a state of relaxation that allows for the free flow of thoughts, it is possible that this same state could be achieved through other methods. One of the reviewed studies taught mindfulness though martial arts (Haydicky et al., 2012). This suggests that a state of relaxation can be achieved through physical activity. An adolescent program could explore teaching mindfulness through activity, such as a sport or art. In addition, the location and duration of the program need to be considered. Programs for adults were 8-week retreats. Adolescents are still in school and, to varying degrees, dependent upon parents/caregivers for transportation. Perhaps the program could be incorporated into the school setting or be set up like a summer camp.

Adolescent language should be used in a mindfulness program. The language needs to be age appropriate but also framed in a manner that increases participation and acceptance. Therapists should avoid words like “therapy”, “treatment”, and “fixing”

which could have a negative connotation. Instead, using words like “coaching”, “skills”, and “tools,” could increase buy-in by normalizing the experience.

The cognitive capacity of adolescents should be considered in the development of a mindfulness program. Adolescents are limited by egocentrism (Sanders, 2013). They tend to perceive the world from their own perspectives and do not consider other perspectives. This could potentially exacerbate any problems the adolescent is experiencing. Thus, a mindfulness program would need to take this into consideration and work to increase the adolescent’s ability to see other perspectives. Adolescents are capable of hypothetical thought and are developing abstract thought. Clinicians could use imagery and imaginary situations to train adolescents in mindfulness. Clinicians should also focus on content relevant to adolescents (such as academic, social, and family problems). Adolescents could be ambivalent or even adverse to treatment and their parents may be the only reason they are in treatment. Thus, autonomy is important in the treatment of adolescents. Clinicians might be able to increase buy-in by providing the adolescent with a sense of control. One suggestion is using motivational interviewing (Rollnick & Allison, 2004) during the first few sessions of a program. Motivational interviewing focuses on understanding the adolescent’s point of view, their priorities, their ideas about change, and their responsibility for their behavior, with the goal of resolving ambivalence to treatment. For example, the instructors could begin the program by asking the adolescent about the concerns they have about their situation. Then the adolescents could discuss their goals and how their current behavior impacts achieving those goals. The discussion of goals is followed by a discussion on how they would change things for the better and ways to follow through with that change. The instructors should discuss mindfulness and other ideas that have worked for

adolescents and give the adolescent a choice. See Table 1 for a suggested outline of an adolescent mindfulness training program based on Potter's (n.d.) MBSR training program.

Table 1

Adolescent Mindfulness Art Program

	Activity	**Psychoeducation**	**Homework**
Week 1 Simple Awareness	Setting life goals.	Motivational Interviewing, Introduce mindfulness.	Complete 1-minute of seated practice (at least 3 times).
Week 2 attention	Outdoor 5 senses exercise.	Stress/anxiety.	Complete 3 minutes of seated practice (at least 4 times). Identify triggers.
Week 3 Dealing with Thoughts	Painting.	Cognitive distortions.	Complete deep breathing (at least 5 times).
Week 4 Stress Responding vs. Reacting	Build stress ball (feeling exercise).	Stress management.	Complete 10 minutes of mindfulness practice (at least 5 times). Practice the one-minute breathing space.
Week 5 Dealing with Difficult Emotions	Create masks.	Responses to pain.	Practice 15 minutes (at least 5 times) turning toward difficult emotions. List things you are grateful for.
Week 6 Mindfulness and Communication	Listen, interpret, draw.	Conflict management.	Mindfulness practice (at least 15 minutes 6 times).
Week 7 Mindfulness and Compassion	Paper flowers.	Self-compassion.	Mindfulness practice (at least 15 minutes 6 times).
Week 8 conclusion	Self-assessment.	Recommendations: continue mindfulness practice, mental health check.	Program evaluation.

Summary

Preliminary research (e.g., Biegel et al., 2009; Blake et al., 2016) suggests that mindfulness is an effective treatment method for stress reduction and anxiety in adolescents. There is some evidence that mindfulness improves coping skills in adolescents (Biegel et al., 2009; Freedenberg et al., 2014; Vohra et al., 2019) although, more research is needed to assess how mindfulness affects coping skills. Does mindfulness strengthen existing skills, promote the development of new skills or function as a coping skill itself? Preliminary research in non-clinical samples suggests that mindfulness could be used as a preventative measure (Franco et al., 2010). Mindfulness was also helpful as an adjunct to traditional treatment (Biegel et al., 2009). More research is needed to determine the effectiveness of mindfulness by itself in adolescents with anxiety. Recommendations are provided for adapting adult programs to mindfulness with adolescents.

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