

Title: Strong evidence to support the use of mindfulness based strategies in reducing symptoms of anxiety more than no intervention, or as much as cognitive behavioral therapy in adults aged 18-80 with anxiety disorders.

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CLINICAL SCENARIO:

Condition/Problem

The target population exhibited a range of anxiety disorders, each characterized by excessive worry and fear impacting daily functioning. The worry that individuals with anxiety disorders feel is in regards to future events, whereas the fear is expressed toward the current events they are experiencing. There were three specific anxiety disorders targeted within this scenario: generalized anxiety disorder (GAD), social anxiety disorder (SAD), and panic disorder (PD). Generalized anxiety disorder is a chronic or long-term excessive and intense worry, commonly about everyday things. Individuals with GAD experience considerable distress and impairment. Social anxiety disorder is manifested in the individual experiencing intense fear and worry in social situations about being judged or evaluated by others. Panic disorder is characterized by spontaneous panic attacks in a variety of situations, and a preoccupation centered on the occurrence of future panic attacks (ADA, 2014). There are many residual problems associated with anxiety disorders, including: distress, an impaired ability to function, social avoidance, experiential avoidance, and varying physical, psychosocial and cognitive problems. Examples of these problems are:

- Physical impairments: increased risk for physical illness, muscle tension, fatigue, restlessness, difficulty sleeping, irritability, sweating, and increased heart rate
- Psychosocial impairments: comorbidities with other mental health diagnoses (depression, other anxiety disorders), substance abuse, and social isolation
- Cognitive impairments: problems following directions, memory impairments, and decreased concentration (ADA, 2014; Brown & Stoffel, 2011)

Client Population

The population studied consisted of English speaking individuals 18-80 years old who were diagnosed with GAD, SAD, or PD according to the DSM-IV. The length of time since the onset of each participant's anxiety disorder was unknown. Participants were excluded if they had active suicidal ideation, a history of major depressive disorder, or active substance use-disorders. Treatment was given in outpatient therapy.

Incidence/Prevalence

According to the Anxiety and Depression Association of America (2014), GAD affects 6.8 million adults (3.1% of the U.S. population) in any given year. Women are twice as likely to be affected as men. About 15 million American adults have social anxiety disorder, and 36% of people report symptoms for 10 or more years before seeking help. Panic disorder affects about 6 million adults in any given year; women are twice as likely to be affected as men (ADA, 2014).

Impact of the Problem on Occupational Performance

Anxiety disorders can be significantly debilitating for an individual in all aspects of their life. Specific occupational areas of impairment depend on the type of anxiety experienced, as well as the worries and fears the individual has. Many occupations are affected due to the

individual avoiding situations or experiences in which those activities would be completed. Occupational performance can be further impacted by physical symptoms, psychosocial issues and cognitive factors. Some specific examples of impacted occupations are listed, with possible reasons in parenthesis:

- ADL's: self-cares (fatigue, excessive anxiety at the thought of getting through the day), sleep/rest (depression, anxiety preventing falling or staying asleep), sexual activity (limited romantic relationships), and eating (depression)
- IADL's: shopping (avoidance), financial management (poor concentration, lack of income), community mobility (avoidance), and home management (fatigue)
- Work: difficulty with finding or maintaining a job (avoidance), and limited employment options (avoidance of school settings)
- Social Participation: decreased number of friendships or romantic relationships (avoidance, irritability, depression, substance abuse)

Intervention

The traditional definition of mindfulness is “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994). Mindfulness strategies aim to reroute past and future overthinking and place attention in the present moment. The technique of mindfulness is based on the individual gaining control of their mind, instead of letting their mind control their thoughts and actions (Dunkley & Stanton, 2014). The process of using mindfulness in therapy includes: mindful eating, body scan, mindful meditation, yoga/mindful stretching, and homework exercises. Interventions within Arch et al. (2013) and Kocovski et al. (2013) contained breathing exercises and discussion on: avoidance, values and goals, and defusion (viewing thoughts as just thoughts instead of labeling experiences/thoughts as positive or negative). One unique aspect of the Arch et al. intervention was a mindfulness retreat where participants practiced three hours of mindfulness. Exposure training was incorporated in the Kocovski et al. intervention and homework assignments whereas exposure was only assigned as homework in the Arch et al. article. Lastly, the Evans et al. protocol incorporated cognitive exercises regarding the association between thoughts and behavior, whereas the other two articles did not. The intervention schedules were as follows: Arch et al., 10 weekly sessions for 90 minutes each with 20-30 minutes of homework and a 3 hour retreat for the seventh session (1080 minutes, not including homework); Evans et al., 8 weekly sessions for 120 minutes each with <30 minutes of homework (960 minutes, not including homework); Kocovski et al., 12 weekly sessions for 120 minutes each with an undisclosed amount of time required for homework (1440 minutes, not including homework).

Why is this intervention appropriate for OT?

Mindfulness fits appropriately within the occupational therapy framework in the following categories that pertain to the individual: habits (specifically dominating habits), global mental functions (specifically the individual's level of consciousness to the present), and specific mental functions (attention, memory, perceptual, thought, psychomotor, emotional, and the individual's experience of self and time). The restorative/healing effect that mindfulness can have within these areas of the individual's functioning can directly impact the areas of occupation affected by anxiety. As mentioned previously, anxiety can negatively affect an individual's ADLs, IADLs, work performance and social engagement. These areas of occupation often rely on the individual's global and specific mental functions, as well as their ability to process their experience of self and time. If these areas of functioning in the individual can be reset and function normally without the hindrances of anxiety, then it is expected that the individual would also see improvement within their ability to perform and engage in ADLs, IADLs, work, and social activities.

Mindfulness is an education/training intervention. It helps the patient to identify the triggers and reasons behind their anxiety and then provides alternative methods for dealing with the fear and worry resulting from certain events and/or objects. In triggering the source of the patient's anxiety and learning how to best deal with it, he/she will gain better control over his/her mental functions, both global and specific.

Intervention ICF Level

The mindfulness based strategy intervention protocols fall into the body function & structure ICF level. The mindfulness based strategy interventions address mood, executive control, body awareness, and attention to the body (all components of body structure & function) (Hammel, 2013).

OT Theoretical Basis

The Model of Human Occupation (MOHO) theorizes that occupational participation can be viewed through analysis of three subsystems (performance, habituation, and volition) within the individual. It is believed that the three components function as a dynamic system; thus, a change in any one subsystem will affect the other subsystems, which in turn will affect occupational participation. MOHO also considers how the environment affects occupational participation; a poor fit between the individual and his/her environment will cause some degree of limitation. This model is consistent with some of the underlying beliefs of mindfulness-based strategies to address anxiety-related habits of mind (daily patterns of anxious thoughts or worries), performance components of mental functions, and potentially low motivation for participating in certain environmental situations or activities. The belief is that addressing areas impacted by the anxiety disorder related to performance, habituation, and volition will decrease the level of anxiety, potentially affording a better fit between the individual and their environment, and helping to increase the individual's occupational participation (Brown & Stoffel, 2011).

The Cognitive-Behavioral Frame of Reference also supports the use of mindfulness in this population. CBT is based on the idea that an individual's behaviors and affect are determined by his/her thoughts and appraisal of a situation. Individuals with anxiety disorders experience irrational thoughts resulting in distorted appraisal and impaired functioning and behaviors. The goal of therapy using this FOR is to manage the irrational thoughts, which will in turn improve the behaviors limiting occupational participation. Mindfulness can be used to indirectly manage behavior and increase occupational participation by helping the individual increase awareness of his/her own cognition and providing techniques to manage the irrational thoughts (Brown & Stoffel, 2011).

Science Behind the Intervention

Currently, research regarding the scientific reasoning behind mindfulness based strategies is purely speculation and lacks rigorous studies striving to explain the correlation between mindfulness based strategies and the changes seen in the body and mind. Mindfulness based strategy interventions have been correlated with changes in areas of the brain that primarily control regulation and stress reactions. The changes in the brain have a positive effect on breathing, heart rate, blood pressure, and immune function (Davidson, 2003; Lazar, 2005; Hölzel, 2010).

The most comprehensive study measuring the scientific reasoning behind mindfulness based strategies was conducted by Davidson et al. in 2003. The authors found that a short mindfulness program produced increases in brain electrical activity and significant increases in immune function. Specifically, the prefrontal cortex, central cortex, and premotor cortex demonstrated the most electrical activity following the intervention. Also, the study found that the left side of the brain (especially the left premotor cortex) increased the electrical activity the most, which is similar to previous studies conducted to evaluate brain activity following mindfulness training (Kang, 1991 & Davidson, 1999). Also, the authors found that

participants significantly increased their antibody titers compared to the control group, especially for the participants who demonstrated more left-sided brain activity. The authors and current research do not have a scientific basis for the correlation between mindfulness based strategies and immune function.

Even though mindfulness based strategy research has positive results and conclusions, more rigorous research needs to be conducted to enhance the scientific knowledge and scientific reasoning behind mindfulness based strategy interventions. Future research needs to study why certain areas of the brain are affected, why there is an increase in immune function, and understand what aspects of the mindfulness based strategy intervention are affecting brain and/or immune function.

FOCUSED CLINICAL QUESTION:

What is the effectiveness of mindfulness based strategies in reducing symptoms of anxiety as compared to cognitive behavioral therapy or no intervention in adults aged 18-80 with anxiety disorders?

SUMMARY:

The effectiveness of mindfulness based strategies was examined by comparing it to CBT and no intervention in populations with anxiety disorders. To determine this, three databases were searched for relevant articles, including a comprehensive search of the UW System Data Bases (UWL-Health Professions Database), Cochrane Collection Plus, and Health Services/Technology Assessment Texts (HSTAT). In total, 18 relevant articles were located, and three articles were critiqued further. Two critiqued articles were level 1b (PEDro scores of 6 and 7), and one was level 5. The articles selected were specific for anxiety disorders, unlike most of the other relevant articles which included diagnoses of depression. The two selected RCTs were high level, and the last article (a quasi-experimental) was well done despite the inherent limitations with the design itself. In addition, the selected articles had similar intervention elements and time frames, so the results were more easily attributed to the intervention itself rather than possible differences between interventions. Following analysis of the results, strong evidence was found to support the effectiveness of mindfulness based strategies in reducing anxiety as much as CBT, and more than no intervention.

CLINICAL BOTTOM LINE:

There is strong evidence to support that mindfulness based strategies reduces symptoms of anxiety more than no intervention, or as much as cognitive behavioral therapy in adults aged 18-80 with anxiety disorders.

Limitation of this CAT: This critically appraised paper has been reviewed by occupational therapy graduate students and the course instructor.

SEARCH STRATEGY:**Table 1: Search Strategy**

Databases Searched	Search Terms	Limits used	Inclusion and Exclusion Criteria
UWL-Health Professions Database	Mindfulness based strategies and anxiety		<ul style="list-style-type: none"> • Peer reviewed • Published between 2005 and 2014 • Adults 18+
UWL-Health Professions Database	Mindfulness based strategies and anxiety		<ul style="list-style-type: none"> • Peer reviewed • Published between 2005 and 2014
UWL-Health Professions Database	Mindfulness based stress reduction and veterans		<ul style="list-style-type: none"> • Peer reviewed • Full text online • Published between 2005 and 2014
Health Services/Technology Assessment Texts (HSTAT)	Mindfulness based strategies and anxiety	Research and review articles	<ul style="list-style-type: none"> • Published in last 10 years
Cochrane Collection Plus	Mindfulness based stress reduction and anxiety		<ul style="list-style-type: none"> • Peer reviewed • Full text online • Published between 2005 and 2014

Note: Reference lists from relevant articles were examined for further article leads.

RESULTS OF SEARCH**Table 2: Summary of Study Designs of Articles Retrieved**

Level	Study Design/ Methodology of Articles Retrieved	Total Number Located	Data Base Source	Citation (Name, Year)
Level 1a	Systematic Reviews or Metanalysis of Randomized Control Trials	4	HSTAT	Chen, Berger, Manheimer, Forde, Magidson, Dachman, & Lejuez, 2012
			HSTAT	Hofmann, Sawyer, Witt, & Oh, 2010

			From Evans et al. article	Krisanaprakornkit, Sriraj, Piyavhatkul, & Laopaiboon, 2008
			UWL-Health Professions Database	Strauss, Cavanagh, Oliver, & Pettman, 2014
Level 1b	Individualized Randomized Control Trials	7	UWL-Health Professions Database	Arch, Ayers, Baker, Almklov, Dean, & Craske, 2013
			Cochrane Collection Plus	Hoge, Bui, Marques, Metcalf, Morris, Robinaugh, Worthington, Pollack & Simon, 2013
			HSTAT	Koszycki, Benger, Shlik, & Bradwejn, 2007
			UWL-Health Professions Database	Kocovski, Fleming, Hawley, Huta, & Antony, 2013
			HSTAT	Omidi, Mohammadi, Zargar, & Akbari, 2013
			HSTAT	Roemer, Orsillo, & Salters-Pedneault, 2008
			From Arch et al. article	Vollestad, Sivertsen & Nielsen, 2011
Level 2a	Systematic reviews of cohort studies	0		
Level 2b	Individualized cohort studies and low quality RCT's (PEDro < 6)	2	Cochrane Collection Plus	Jazaieri, Goldin, Werner, Ziv & Gross, 2012
			HSTAT	Majid, Seghatoleslam, Homan, Akhvast, & Habil, 2012
Level 3a	Systematic review of case-control studies	0		
Level 3b	Case-control studies and non-randomized controlled trials	0		
Level 4	Case-series and poor quality cohort and case-control studies	1	UWL-Health Professions Database	Sharma, Mao, & Sudhir, 2012
Level 5	Expert Opinion	4	UWL-Health Professions Database	Evans, Ferando, Findler, Stowell, Smart, & Haglin, 2008
			UWL-Health Professions Database	Hazlett-Stevens, 2012

			UWL-Health Professions Database	Hayes-Skelton, Orsillo, & Roemer, 2013
			UWL-Health Professions Database	Roemer, Williston, Eustis, & Orsillo, 2013

STUDIES INCLUDED

Table 3: Summary of Included Studies

	Study 1 (Arch, Ayers, Baker, Almklov, Dean, & Craske, 2013). http://www.sciencedirect.com/science/article/pii/S0005796713000144
Design	Randomized control trial (The study followed a 2x3 longitudinal research design, with Group (CBT versus adapted MBSR) as the between-subject variable and Time (Pre, Post, FU) as the within-subject variable. A computerized random number generator created all randomization sequences, which were known to the PIs but not the blind assessors.)
Level of Evidence	1b
PEDro score (only for RCT)	6
Population	The population for this article consisted of 124 veterans that were referred to treatment to the “Anxiety Disorders Clinic” in the VA San Diego Healthcare System. The participants were between 18-75 years of age, spoke English, and were diagnosed with a DSM-IV panic disorder with or without co-existing agoraphobia, GAD, SAD, specific phobia (SP), OCD, or civilian PTSD. Exclusion criteria: Military-related PTSD, active suicidal ideation, active substance-use disorders, current participation in other CBT or adapted MBSR
Intervention Investigated	The mindfulness based stress reduction (MBSR) strategies were adapted from the protocol within a manual written by the first author, Arch, and three other trained MBSR instructors. The manual incorporated views from the Massachusetts University Center of Mindfulness, with a few revisions suggested by previous users. The revisions include: shortening the length of treatment sessions to 10 sessions at 90 minutes (these were also made to match the time of the CBT sessions), the homework was also shortened to 20-30 minutes of meditation rather than 45 minutes.
Comparison Intervention	CBT for anxiety disorders followed a manualized protocol originally authored by Craske (2005) and used successfully in previous clinical trials. Total treatment time=15 hours
Dependent Variables	1. Reported anxiety symptoms 2. Worry 3. Depression symptoms
Outcome	Primary outcome measures consisted of the CSR (diagnosis severity), Penn State

Measures	Worry Questionnaire (PSWQ), anxious subscale of the Mini Mood and Anxiety Symptom Questionnaire (MASQ-AA), and the Beck Depression Inventory-II (BDI-II)
Results	<ol style="list-style-type: none"> 1. Principle CSR improved stat. sig. in both groups with no differences between the groups. 2. The MBSR group improved statistically significantly on the PSWQ. The CBT group did not improve here. Both the MBSR and CBT group showed statistically significant improvements on the MASQ. Between group measures showed statistically significant differences in favor of CBT at FU.
Effect Size	<p>Between Group Analysis</p> <p>Principal CSR: Post -.29, FU -.56</p> <p>*PSWQ: Post +.07, FU -.25</p> <p>*MASQ-AA: Post +.31, FU +.49</p> <p>*BDI-II: Post +.08, FU -.08</p> <p>*self-reported measure</p>
Conclusion	<ol style="list-style-type: none"> 1. MBSR and CBT had similar therapeutic outcomes. 2. MBSR could possibly be added to the repertoire of treatment approaches for group based anxiety reduction. This MBSR protocol was adapted by the primary author from the University of Massachusetts Center for Mindfulness. 3. The size of improvement (effect size) was larger for therapist rated measures than patient self-reported measures.

	<p>Study 2 (Evans, Ferrando, Findler, Stowell, Smart, & Haglin, 2008) http://libweb.uwlax.edu:2093/science/article/pii/S0887618507001569</p>
Design	Quasi-experimental
Level of Evidence	5
PEDro score (only for RCT)	4
Population	<p>Convenience sample of 11 individuals (6 F, 5 M) ages 36-72 (mean = 49)- highly educated</p> <p>Inclusion: 18-80 years old, English speaking, medically stable, met criteria for GAD according to the DSM-IV</p> <p>Exclusion: comorbid current major depression, substance abuse/ dependence, psychosis, suicidal and/or homicidal ideation, dissociative states</p>
Intervention Investigated	<p>To investigate whether an open trial of a MBCT (adapted from MBSR) therapy group would be an acceptable and effective treatment for patients with GAD.</p> <ul style="list-style-type: none"> • Pre/ posttest design (after completion of intervention) • 8 weeks for 2 hr. • Group format • Led by MBSR experienced clinical psychologist • Group focused on training in mindfulness meditation, introduced to mindful eating and walking • Each session followed agenda- formal and informal mindfulness- based stress

	<p>reduction techniques</p> <ul style="list-style-type: none"> • Homework assignments (told to practice <30 min/day and record)
Comparison Intervention	None.
Dependent Variables	<ul style="list-style-type: none"> • Anxiety • Tension • Worry • Depressive symptomatology • Mindful awareness
Outcome Measures	<ul style="list-style-type: none"> • BAI (Beck Anxiety Inventory) • BDI-II (Beck Depression Inventory- II) • PSWQ (Penn State Worry Questionnaire) • POMS (Profile of Mood States) • MAAS (Mindfulness Attention Awareness Scale)
Results	<ul style="list-style-type: none"> • Mindful awareness was sig. lower than a normative sample at baseline ($p < .006$) • Non sig. increase in mindful awareness pre-post • Stat. Sig. reductions in BAI, PSWQ, POMS and BDI from baseline to posttest
Effect Size	<p>The authors did not list effect size and reported the clinical meaningfulness according to the outcome measures and how many participants improved to a non-clinically significant score range.</p> <p>The authors found that a large amount of participants decreased from clinically significant to non-clinically significant from pre-treatment to post-treatment for the BAI (five subjects), PSWQ (five subjects), POMS (three subjects), and BDI (three subjects).</p> <p>Calculated ES were BAI=2.72, PSWQ=3.62, and MAAS=.64</p>
Conclusion	<p>As a group, saw significant decrease in anxiety, tension, worry, and depressive symptoms following intervention. The group became as mindful as a normative sample following intervention. Feasible and acceptable treatment for GAD. However, small sample, not-randomized, and potentially non-generalizable due to participants' high level of education and lack of a comorbid diagnosis of depression, which is common in individuals with anxiety disorders.</p>

	<p>Study 3 (Kocovski, Fleming, Hawley, Huta, & Antony, 2013) http://ac.els-cdn.com/S0005796713001824/1-s2.0-S0005796713001824-main.pdf?_tid=3425cc42-5f7f-11e4-abf9-00000aab0f6b&acdnat=1414596246_87d2dd256a42c2503365d72e3fbe1e0e</p>
Design	Randomized Control Trial
Level of Evidence	1b
PEDro score (only)	7

for RCT)	
Population	<p>Convenience sample of 137 participants, aged 18-62</p> <p>Inclusion: principle diagnosis of SAD based on DSM-IV, English fluency, aged 18-65, and psychotropic medications allowed if doses stable for 3 months prior to study.</p> <p>Exclusion: current major depressive disorder, current alcohol or substance abuse or dependence, lifetime psychosis or mania, current suicidal intent, past ACT or CBT for SAD.</p>
Intervention Investigated	<p>Mindfulness and Acceptance-Based Group Therapy (MAGT) using an unpublished manual created by the first two authors, with 2 hour weekly sessions, for 12 weeks including mindfulness exercises (such as body scan, mindful stretching, mountain meditation), acceptance, homework of mindfulness exercises, written work, exposures, values, goals, and diffusion (process of considering thoughts as just thoughts).</p>
Comparison Intervention	<ul style="list-style-type: none"> • Cognitive Behavioral Group Therapy (CBGT) using principles from Heimberg & Becker (2002), with 2 hour weekly sessions, for 12 weeks (24 hrs. total) including cognitive restructuring, exposure, and homework including cognitive restructuring and exposure • Wait list
Dependent Variables	<p>Primary</p> <ol style="list-style-type: none"> 1. Social anxiety 2. Depression 3. Valued living <p>Secondary</p> <ol style="list-style-type: none"> 1. Cognitive reappraisal 2. Mindfulness 3. Acceptance 4. Rumination
Outcome Measures	<ol style="list-style-type: none"> 1. The primary outcome measure was the SPIN (Social Phobia Inventory) a self-report measure of fear and avoidance of a range of social situations and of physiological symptoms of anxiety 2. LSAS (Liebowitz Social Anxiety Scale) assesses fear and avoidance of performance and social interaction situations 3. CGI (Clinical Global Impression) 4. ERQ (Emotion Regulation Questionnaire, Reappraisal subscale) 5. FMI (Freiburg Mindfulness Inventory) 6. SA-AAQ (Social Anxiety-Acceptance and Action Questionnaire) 7. RRQ (Rumination Reflection Questionnaire- Rumination subscale) 8. BDI-II (Beck Depression Inventory- Second Edition) 9. VLQ (Valued Living Questionnaire) 10. GCS-R (Group Cohesion Scale-Revised) <ul style="list-style-type: none"> • All self-reported measures (except GCS-R) were completed at baseline, mid treatment (6 weeks), and post-treatment (12 weeks) by all groups. MAGT and CBGT also completed them at 3-month follow-up. • Clinical psychology graduate students, blinded, administered the LSAS, CGI, and SCID-SAD (Structured clinical interview) at post treatment (all groups) and

	follow-up (MAGT, CBGT)
Results	CGI/SPIN/LSAS: Significant improvement within group, non-significant difference between MAGT and CBGT, and significant difference between MAGT and WAIT. FMI: significant improvement within the MAGT group. The MAGT and CBGT groups maintained gains at the 3 month-follow up with no further improvements. The WAIT group was not re-tested at the 3 month follow-up.
Effect Size	The completers LSAS: between MAGT and CBGT $d = .0349$, between MAGT and wait $d = 4.22$ CGI: between MAGT and CBGT $d = .22$, between MAGT and wait $d = .624$
Conclusion	The authors concluded that MAGT on average worked as well as CBGT and MAGT may be a good alternative to CBGT. The MAGT and CBGT participants maintained change at 3-month follow up, which suggests that the interventions may have lasting benefits. The therapist reported measures also seemed to indicate more change than participants' self-reports (although no formal analysis was completed to show the degree of this difference).

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH (Synthesis Section)

PICO Question

What is the effectiveness of mindfulness based strategies in reducing symptoms of anxiety as compared to cognitive behavioral therapy or no intervention in adults aged 18-80 with anxiety disorders?

Overall conclusions

The summative research reported the effects of mindfulness based strategies on anxiety symptoms as measured within the categories of: clinical severity, reported anxiety symptoms, worry, and mindful awareness. The authors' statistical analyses took into account high dropout rates by using intention-to-treat analyses; thus the results were not overestimated.

Clinical severity was reported as symptom severity, distress and disablement of the individual's anxiety. It was found that mindfulness based strategies significantly improved clinical severity, with an extremely large effect size. Significant differences were found between mindfulness groups and control (no treatment) with a medium effect size, but non-significant and non-meaningful differences were found between mindfulness groups and CBT groups. Gains were maintained at 3-month follow-up.

The reported anxiety symptoms were defined as anxious arousal, fear, avoidance, and physiological symptoms of anxiety. Self-reported measures of anxiety verified that participants within each of the studies experienced less symptoms of their anxiety after participation in mindfulness groups. Mindfulness groups and CBT groups did not have significant differences in improvements in reported anxiety symptoms, but mindfulness groups and wait groups did. The meaningfulness of the reduction in anxiety symptoms for mindfulness groups was mixed, with effect sizes ranging from small to extremely large. The studies varied in some intervention elements and assessments used to measure anxiety symptoms (the mindfulness group with components of avoidance and exposure had small effect sizes). Extremely large effect sizes were also found between the mindfulness group and the wait group, with small effect sizes found between the mindfulness group and the CBT group. Gains were maintained at 3-month follow-up.

Self-reports were used to gain clinical measures on symptoms of pathological worry, in areas of generality, excessiveness, and uncontrollability of the worry. Results from two studies showed clinically significant reduction in worry after the use of mindfulness based strategies, with medium to extremely large effect sizes. The studies used the same measure and similar treatment dosage, but varied in some aspects of the intervention (the mindfulness group with cognitive exercises had the larger effect sizes). Worry was found to have a small effect size when compared to CBT. Noted gains were maintained at 3-month follow-up.

Mindful awareness measures were used to gain clinical measures in mindful presence, non-judgmental acceptance, openness to experiences, and insight. Mindful awareness was shown to have statistically significant improvement within mindfulness group treatment in one study and a positive trend in another study. The effect sizes for these two studies ranged from medium to very large. Participants receiving the larger amount of treatment hours had the significant improvement and greatest effect sizes. Mindfulness was found to improve statistically significantly with a large effect size when compared to a wait control group. Mindfulness did not improve significantly when compared to a CBT group.

Slight differences found in effect sizes could be attributed to different outcome measures used for the same variable, overall treatment dosage and time (16-24 hours of treatment (not including time for homework) over a span of 8-12 weeks), and subtle differences in intervention components (all had elements of mindful eating, body scan, mindful meditation, yoga/mindful stretching, and homework exercises, 2 incorporated homework with exposure, breathing exercises and discussions on avoidance, values, goals, and defusion, while the other had cognitive exercises). In addition, two of the articles suggested that there was a difference in the amount of change noted between the therapists and the participants, with the therapists noting more positive change than participants. Other differences noted were the specific inclusion criteria of veterans for one study, and different anxiety diagnosis across all three (GAD, SAD, and PD). Additionally, one study had a significantly larger completion rate compared to the other two articles. However, all three articles yielded similar, non-conflicting results overall despite the minor differences mentioned above.

There is strong evidence to support that mindfulness based strategies reduces symptoms of anxiety more than no intervention, or as much as cognitive behavioral therapy in adults aged 18-80 with anxiety disorders.

Boundaries

A total of 272 English speaking individuals between the ages of 18-80 diagnosed with GAD, SAD, or PD participated in the studies. Participants were not included if they had major depressive disorder (MDD), active substance abuse, or suicidal ideation. The participants' education ranged from 11-20 years with most completing post-secondary education or beyond, indicating highly educated individuals. Two of the articles had high dropout rates (between 8% and 51%); however, the dropout rates were similar to previous studies conducted.

Implications for practice

The mindfulness based intervention protocol requires a significant commitment over time to complete therapy and homework exercises. The minimum intervention time to see statistically significant and meaningful results is 16 hours of therapy over 8 weeks; therefore, participants need to be motivated to complete the duration of therapy. Effective therapy

contained the following elements: mindful eating, body scan, mindful meditation, yoga/mindful stretching and homework exercises. The studies demonstrated the mindfulness based strategies are useful for decreasing anxiety symptoms in individuals with GAD, SAD, or PD. Also, the studies showed the intervention maintained change during 3-month follow-ups, suggesting possible long-term benefits. However, it is still unknown which strategies of mindfulness are most effective and on which population and disorder the strategies are most useful. The participants were highly educated and the studies may need to be replicated with individuals at a lower educational level. In addition, individuals with active suicidal ideation, active substance abuse or dependence disorders and major depressive disorder were excluded from the studies; therefore future research needs to be conducted to determine the effectiveness of mindfulness in these populations.

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