

# Mindfulness-based Cognitive Therapy for Generalised Anxiety Disorder: a Systematic Review and Meta-analysis

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## Abstract

**Background:** Generalised anxiety disorder (GAD) has harmful effects on physical and mental health and quality of life. Mindfulness-based cognitive therapy (MBCT) is a treatment option for GAD. This meta-analysis was conducted to determine the effectiveness of MBCT on GAD.

**Methods:** Two authors independently performed the eligibility, quality assessment, and data extraction processes, and consensus was reached in case of discrepancies. Electronic databases were searched for eligible studies (randomised controlled trials, randomised trials, cluster randomised controlled trials, and clinical trials) up to November 2018 using keywords: mindfulness-based cognitive therapy OR mindfulness based cognitive therapy OR MBCT AND general anxiety disorder OR GAD\*. The methodological quality of studies was assessed using the revised Jadad scale. Cohen's formula was used to determine the effect size based on the mean and standard deviation of the changes in the study groups before and after the intervention.

**Results:** Six studies that compared the effectiveness between MBCT and controls were included for analysis. The mean revised Jadad score of the six studies was 4.3 (range, 3-6). The overall mean effect size was -0.65. The funnel plot of effect sizes in relation to the effect size standard error showed a symmetrical distribution. Compared with controls, MBCT significantly improved the treatment outcome of GAD in all studies, except one.

**Conclusion:** MBCT was effective for treating GAD.

**Key words:** Anxiety disorder; Cognitive behavioural therapy; Meta-analysis; Mindfulness

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## Introduction

Generalised anxiety disorder (GAD) is characterised by extreme and uncontrollable worries and is associated with other anxiety disorders, depression, and a range of physical health disorders.<sup>1</sup> GAD often occurs in early adulthood and is twice as likely to occur in women as in men.<sup>2</sup> The prevalence of GAD in the Iranian population aged 18 to

65 years is 2.5%<sup>3</sup> and 0.6% to 4.3% in other countries. The risk of its lifetime prevalence is 9%.<sup>4</sup> GAD has more harmful effects than other anxiety disorders on physical and mental health and quality of life.<sup>5,6</sup> All these disorders use considerable healthcare services and cause functional disruptions.<sup>7</sup>

Pharmacotherapy is the first treatment option.<sup>8,9</sup> However, it is associated with a relatively high rate of relapse and uncertain lasting effects after discontinuation of medication.<sup>10,11</sup> Thus, psychological treatments are necessary.

Mindfulness-based cognitive therapy (MBCT) can reduce general anxiety symptoms and anxiety sensitivity (the main components of GAD), with a specific mental orientation towards experience and awareness about the present time in a non-judgmental style by minimising the involvement in thoughts and feelings.<sup>12</sup> MBCT is effective in treating patients with GAD.<sup>13</sup> MBCT is an effective adjuvant to pharmacotherapy in patients with panic disorder or GAD.<sup>14</sup> MBCT is more efficacious than a training programme for treating anxiety disorder.<sup>15</sup> Therefore, we conducted a meta-analysis on the effectiveness of MBCT on GAD.

## Methods

The PRISMA guideline for reporting systematic reviews

and meta-analyses was used.<sup>16</sup> Inclusion criteria for studies were: (1) randomised controlled trials, randomised trials, cluster randomised controlled trials, and clinical trials of MBCT for the treatment of GAD reported in English or Persian languages and published in peer-reviewed journals. (2) Participants aged  $\geq 18$  years diagnosed with GAD or GAD symptoms according to any diagnostic classification system who underwent MBCT, with anxiety scores measured according to a standard test.

Two authors independently performed the eligibility, quality assessment, and data extraction processes, and consensus was reached in case of discrepancies. Electronic databases (PsycINFO, PubMed, Embase, ProQuest, Scopus, Web of Science, Google Scholar, and Medline) were searched for eligible studies up to November 2018 using keywords: mindfulness-based cognitive therapy OR mindfulness based cognitive therapy OR MBCT AND general anxiety disorder OR GAD\*. Papers in clinical psychology journals and other journals that had the most relevant early studies were also searched manually. In addition, reference lists of found articles and other reviews were inspected, and leading researchers in the field of MBCT were contacted to identify further relevant studies. Duplicates were removed from the total number of identified records. Abstracts from the remaining records were screened to retrieve full-text articles for assessment of eligibility. Studies fulfilling inclusion criteria were selected for meta-analytic evaluation. The retrieval process was checked by authors.

A data extraction sheet was developed for participant characteristics (including age, sex, baseline anxiety score, and medication), group characteristics (including intervention, comparison condition, number of group participants and dropouts, and use of non-study treatments for anxiety within groups), and diagnosis and therapeutic characteristics (including diagnostic classification system, length of sessions and therapy period).

The methodological quality of studies was assessed using the revised Jadad scale based on six criteria: (1) the study was described as randomised; (2) the randomisation procedure was described and appropriate, ie, study participants were randomly allocated independent of the investigators “by methods allowing each participant to have the same chance of receiving each intervention”; (3) blind outcome assessments were reported (blindness of participants and therapists, as required by the original Jadad criteria, are not possible); (4) the blinding method was appropriate, (5) the number and reasons of withdrawals and dropouts were provided for each group, and (6) there was a description of inclusion/exclusion criteria. One point was assigned for each of the six fulfilled criteria; the maximum Jadad score was 6. Disagreements between raters were resolved by discussion.

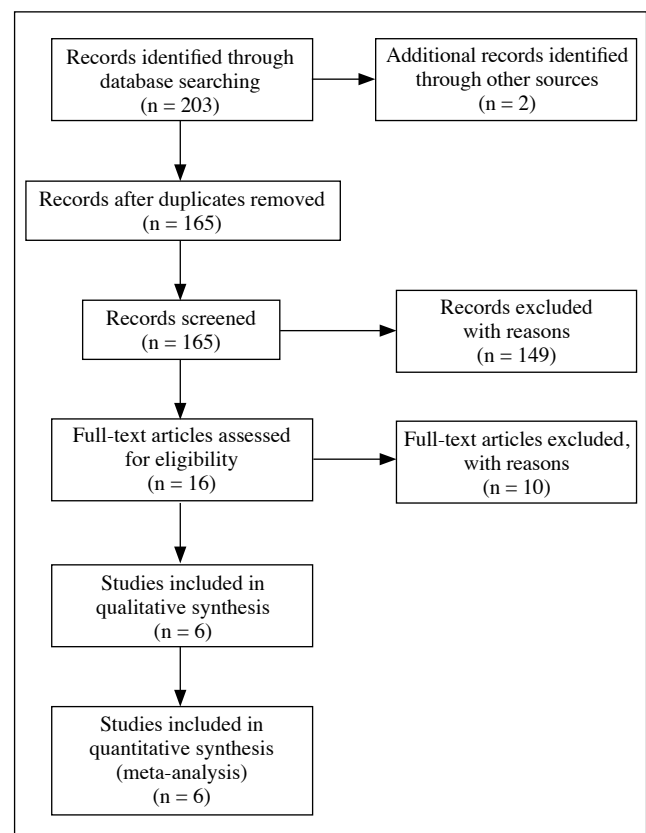
Statistical analyses were conducted using the STATA (version 16). Forest plot statistics and a funnel plot of individual study effect sizes were used for detecting potential biases in the publication of study results.

## Results

The flowchart for the inclusion process of studies is shown in Figure 1. The title and methodology of each eligible study were independently assessed. Of 203 papers evaluated, 197 were excluded owing to repetition ( $n = 38$ ), MBCT not being used or no inclusion criteria ( $n = 149$ ), or not conducted specifically for GAD ( $n = 10$ ). The remaining six studies that compared the effectiveness between MBCT and controls were included for analysis.<sup>14,15,17-20</sup>

Among the six studies, the sample sizes ranged from 11 to 182; the mean age of participants ranged from 32 to 50 years; and percentage of women ranged from 0% to 79% (Table 1). The assessment tool used was the Beck Anxiety Index. The diagnosis of GAD was made according to the DSM-IV. The mean revised Jadad score of the six studies was 4.3 (range, 3-6) [Table 2].

Effect sizes (Hedge's  $g$ ) and weights of six studies are shown in Figure 2. The overall sample size was 403. Effect sizes varied from -0.017 to -1.07, with an overall mean of -0.65 (95% confidence interval, -0.97 to -0.32;  $z = -3.93$ ,  $p = 0.001$ ). Heterogeneity was considerable ( $I^2 = 49.96$ ). This effect ( $d = 0.65$ ) was significant ( $p < 0.001$ ) and can be considered as a good effect indicating that the finding is robust. The fail-safe  $N$  analysis indicated that 14 missing equal sample size studies with no effect of MBCT compared



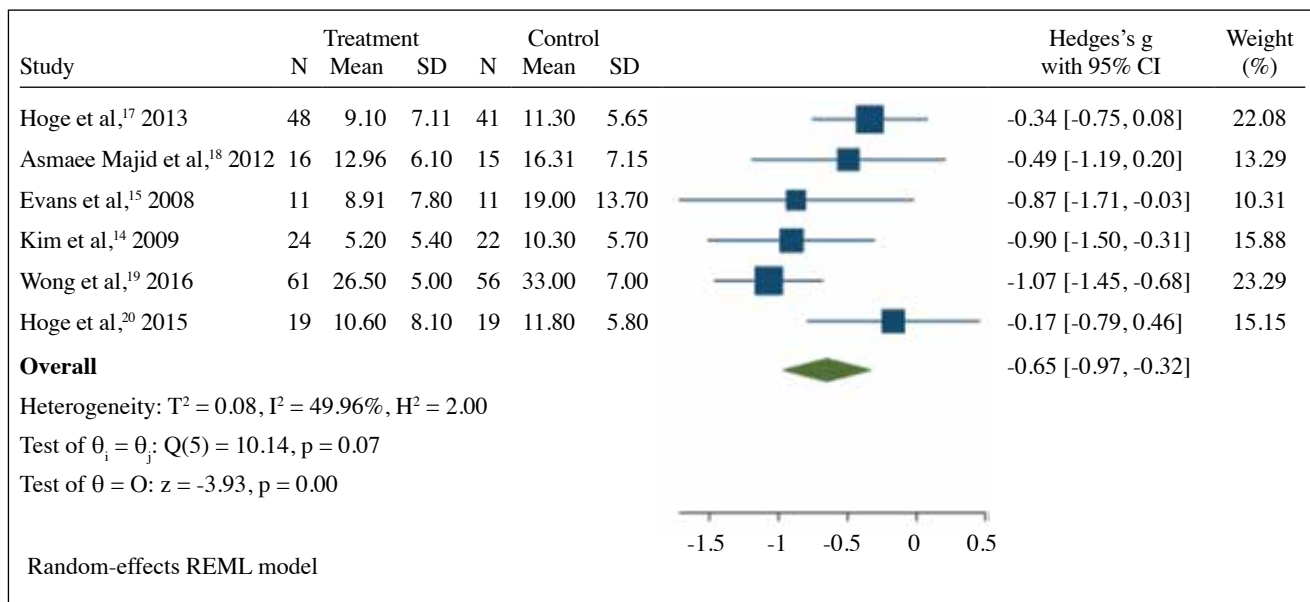
**Figure 1.** Flowchart of the inclusion process of studies

**Table 1. Characteristics of the six studies**

Study	Country	No. of participants	Age, y Mean (range)	% of women	Diagnosis criteria	Assessment tool
Hoge et al, <sup>17</sup> 2013	USA	89	39 (≥18)	52	DSM-IV for generalised anxiety disorder (GAD)	Beck Anxiety Index
Asmaee Majid et al, <sup>18</sup> 2012	Iran	37	32 (≥18)	0	DSM-IV for GAD	Beck Anxiety Index
Evans et al, <sup>15</sup> 2008	USA	11	49 (18-80)	66	DSM-IV for GAD	Beck Anxiety Index
Kim et al, <sup>14</sup> 2009	Korea	46	39 (20-60)	58	DSM-IV for GAD or panic disorder	Beck Anxiety Index
Wong et al, <sup>19</sup> 2016	China	182	50 (21-65)	79	DSM-IV for GAD	Beck Anxiety Index
Hoge et al, <sup>20</sup> 2015	USA	38	37 (≥18)	55	DSM-IV for GAD	Beck Anxiety Index

**Table 2. Methodological quality of studies based on the revised Jadad score**

Study	Was the study described as randomised?	Was the method of randomisation appropriate?	Was the study described as blinded?	Was the method of blinding appropriate?	Was there a description of withdrawals and dropouts?	Was there a clear description of the inclusion/exclusion criteria?	Revised Jadad score (max = 6)
Hoge et al, <sup>17</sup> 2013	Yes	Yes	No	Not described	Yes	Yes	3
Asmaee Majid et al, <sup>18</sup> 2012	Yes	Yes	No	Not described	Yes	Yes	3
Evans et al, <sup>15</sup> 2008	Yes	Yes	No	Not described	Yes	Yes	3
Kim et al, <sup>14</sup> 2009	Yes	Yes	Yes	Not described	Yes	Yes	5
Wong et al, <sup>19</sup> 2016	Yes	Yes	Yes	Yes	Yes	Yes	6
Hoge et al, <sup>20</sup> 2015	Yes	Yes	Yes	Yes	Yes	Yes	6



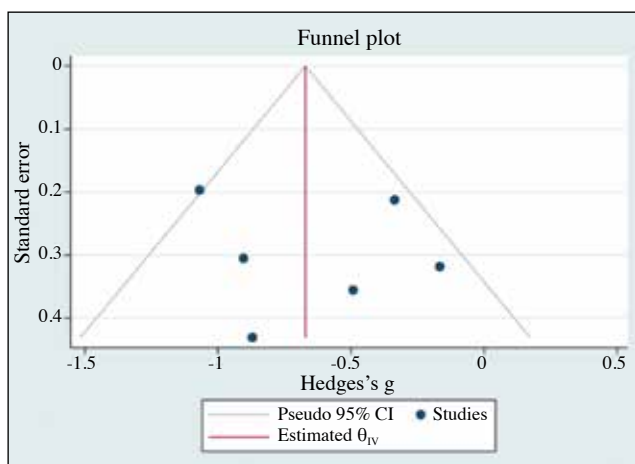
**Figure 2. Comparison of effectiveness between mindfulness-based cognitive therapy (MBCT) and controls: a risk ratio of <1 indicates favouring MBCT, and >1 favouring controls**

with controls (ie, a risk ratio of 1.0) would be needed to reduce the overall risk of relapse effect size to a non-significant level ( $p > 0.05$ ). The funnel plot of effect sizes in relation to the effect size standard error had a symmetrical distribution (Figure 3).

## Discussion

In the present meta-analysis, the overall risk ratio for GAD in MBCT versus controls was 0.65, which indicates that MBCT is an effective intervention for GAD. The methodological quality of the six studies was high, with a mean revised Jadad score of 4.3. There was no evidence of publication bias according to tests of funnel plot. Fourteen missing studies of comparable sample size with an effect size of zero would be needed to nullify the result. Therefore, this meta-analysis is considered credible. Evidence of heterogeneity between individual studies can be neglected because of vast cultural differences between countries of studies.

A study of the effect of MBCT on GAD reported significant improvement in pathological concerns, stress, quality of life, and a number of other symptoms that remained after treatment, although the effect size on the improvement of pathologic concerns was very small.<sup>21</sup> In MBCT, owing to the awareness exercises and being in the moment as well as awareness of physical sensations and psychological sensations, participants realise that when they are anxious, their heart rate and respiration changes. By MBCT, participants focus their attention on their body and thus increase the awareness of the body, feelings, and thoughts associated with anxiety, which increases the sense of symptom controllability, leading to anxiety reduction.



**Figure 3. Funnel plot of standard error by effect sizes for relative risk of relapse between mindfulness-based cognitive therapy (MBCT) and controls: there is no publication bias when individual study effect sizes (risk ratios) are symmetrically distributed around the overall mean effect size (the vertical line in the middle).**

MBCT is effective in the treatment of GAD by integrating elements of philosophy, dialectics, mindfulness, acceptance, and communication, and taking advantage of mediating as a pivotal domain, as well as focusing on attention control in the treatment.<sup>22</sup>

The present study has some limitations. The number of studies included was small. The quality and type of methodology of the studies differed. In some studies, the MBCT group was compared with the non-intervention group, whereas in other studies, the MBCT group was compared with other-treatment group. This complicated the analysis and limited the power of results.<sup>23</sup> In addition, the present study did not report the required data in the studies. In case of no access to full paper, the abstracts of studies were excluded. There was no access to some information sources and some required papers.

## Conclusion

MBCT was effective for treating GAD.

## Declaration

The authors have no conflict of interest to disclose.

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