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Mindfulness and avoidance mediate the relationship between yoga practice and anxiety

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ABSTRACT

Objectives: There is accumulating evidence that yoga and mindfulness meditation can alleviate symptoms of anxiety, although the mechanisms by which this occurs remain unclear. The purpose of this study was to examine the relationship between yoga practice and self-reported anxiety as well as the potential mediating roles of mindfulness and emotional avoidance.

Methods: Using a cross-sectional design, 367 participants were recruited online and completed measures of anxiety, avoidance, and mindfulness.

Results: Results showed that length of yoga practice was significantly correlated with lower anxiety in yoga practitioners. Avoidance and mindfulness mediated the relationship between length of yoga practice and anxiety, shedding light on possible mechanisms by which these practices reduce anxiety.

Conclusions: Future experimental and longitudinal research is needed to examine the causal role of mindfulness and avoidance in the relationship between yoga practice and anxiety, and whether yoga is a useful adjunct to cognitive behaviour therapy for anxiety disorders.

1. Introduction

Yoga is a heterogenous group of mind-body practices that have been used to reduce human suffering for millennia, with origins in Indian philosophy and culture.[1] Historically, the goal of yoga was to 'yoke' or unify mind, body and spirit through various mental, physical and ethical practices.[2] However, in contemporary settings, particularly in developed countries, yoga is a largely secular practice mainly comprised of physical postures (asana), breathing exercises (pranayama) and meditation techniques (dyana) aimed at fostering physical and mental health.[3,4] Similarly, contemporary mindfulness meditation interventions such as Mindfulness-Based Stress Reduction (MBSR; [5]) are secularised adaptations of Buddhist teachings,[6,7] which themselves emerged within a yogic context.[2]

In modern health research settings, there is accumulating evidence supporting the benefits of yoga and mindfulness meditation for improving psychological functioning.[8–10] For yoga, the strongest evidence exists for its use in treating depression[11,12]; however there is increasing evidence of its efficacy in reducing anxiety. [13,14] For example, researchers studied the effects of a two-month yoga intervention in 34 healthy women and found a significant reduction in anxiety compared to wait-list control.[15] Similarly, a 6-week yoga intervention resulted in significant decreases in anxiety compared to a relaxation control group.[16] The anxiolytic effect of yoga has been observed in various groups including college students,[17] musicians,[18] and breast cancer patients.[19] However, despite evidence for the efficacy of yoga in reducing anxiety, systematic reviews suggest there are several methodological limitations in this area, including a paucity of evidence about mechanisms of change in these typically heterogeneous interventions.[20–23]

One potential explanation for how yoga and mindfulness meditation reduce anxiety is that these interventions reduce avoidance of negative affect.[22,24] Avoidance of negative affect has been proposed as a central 'transdiagnostic' maintaining mechanism across anxiety and mood disorders.[25,26] Treatments that are applicable across all anxiety disorders – known as 'transdiagnostic' approaches – aim to combat emotional and behavioural avoidance, in part with a sustained present-focused awareness and acceptance of negative emotions.[25,27,28] The concept of acceptance is central to third-wave cognitive behavioural therapies, such as Acceptance and Commitment Therapy (ACT[29];) and

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Mindfulness-Based Cognitive Therapy (MBCT[30];), amongst others. [31] Similarly, mindfulness is a key feature of these third-wave interventions,[32] which aim to reduce anxiety by attenuating ruminative cognitive processes and avoidant behaviours, while increasing acceptance of internal emotional experiences.[33]

Despite the historical and philosophical commonalities between yoga and mindfulness practices, few studies have examined their relationship empirically, particularly in the context of explaining mechanisms of change in yoga interventions. The present study therefore aimed to explore these relationships, given there is some evidence that yoga practice increases self-reported levels of mindfulness.[34] It also aimed to explore factors which might mediate the relationship between yoga and anxiety (e.g. avoidance, mindfulness), in order to elucidate potential mechanisms of change in yoga for anxiety. It was hypothesised that yoga practice would be associated with decreased avoidance of negative affect, given its focus on experiential acceptance and awareness of present-focused experience, including negative emotions. Given the previously indicated positive association between avoidance and anxiety,[27] and the negative association between mindfulness and anxiety,[35] we also expected that after controlling for age and gender, yoga practitioner status (yoga practice versus non-yoga practice) would be negatively associated with anxiety. Finally, it was expected that length of yoga practice would be negatively associated with anxiety in yoga practitioners and that avoidance and mindfulness would mediate this relationship.

2. Method

2.1. Research design

A cross-sectional, correlational design was used, with self-reported measures of anxiety as the criterion variable. Predictor variables were yoga practice (length in years x practice frequency within a week), non-yoga practice, avoidance, and mindfulness.

2.2. Participants

The sample consisted of 367 participants (308 females, 59 males). Of these, 301 were yoga practitioners and 66 non-yoga practitioners, with ages ranging from 19 to 66 (M = 35.27, SD = 8.83). Types of yoga practiced included Ashtanga 47.2%, Yin 3%, Vinyasa 27.9%, Iyengar 1.7%, and Other 20.3%.

A priori power analysis determined that a sample size of 300 participants would be required for an 80% chance of detecting a relatively small population regression coefficient (f^2 = .05) for the most complex nine-predictor regression model. The same number of participants would be required for an 80% chance of detecting a relatively small indirect effect (κ^2 = .05) using mediation analysis.

2.3. Measures

2.3.1. Anxiety

Anxiety (criterion variable) was measured using the 7-item anxiety subscale of the Depression Anxiety Stress Scale-21 (DASS[36]). This scale consists of 21 items that measure depression, anxiety, and stress over the past week. Internal consistency of the anxiety subscale was excellent (α = .83).

2.3.2. Avoidance

Avoidance was measured using the 31-item Cognitive Behavioural Avoidance Scale (CBAS[37]). The scale had excellent internal consistency (α = .94).

2.3.3. Mindfulness

Mindfulness was measured using the 39-item Five Facet Mindfulness Questionnaire (FFMQ[38]). This scale was used to measure five aspects of mindfulness, including observing (MO; attending to internal or external environments), describing (MD; ability to label the internal environment), acting with awareness (MAW; attending entirely to the present moment), non-judging of experience (MNJ; ability to not evaluate the internal environment), and non-reactivity to experience (MNR; ability to attend to the internal environment without negative rumination). These subscales had adequate internal consistency (α = .85, 0.91, 0.91, .89, and .85, respectively).

2.3.4. Yoga Practice

Participants were asked whether they practiced yoga. If they responded yes, they were asked about the type of yoga, frequency of practice in weeks, and length of time practicing yoga in months or years. Participants responding yes to this question were subsequently identified as yoga practitioners.

2.4. Procedure

The study was granted ethics approval by the Curtin University Human Research Ethics Committee. Participants were recruited through convenience sampling. Students from a yoga school in Perth, Australia as well as personal contacts of the researchers were invited to participate. Links to the online questionnaire were posted on social media and sent via emails. The questionnaire was constructed using the Qualtrics platform and demographic information was asked first, followed by the DASS, CBAS, and FFMQ. Consent was given once participants read the information sheet and clicked on the link to start the survey.

3. Results

Inspection of normality revealed that the continuous yoga practice variable, anxiety and avoidance were positively skewed. Transformations were conducted on avoidance and the continuous (length of) yoga practice variables. Due to the violations of normality for anxiety, Spearman's Rho correlations and Non-Parametric Simultaneous Multiple Regression Analysis (NPSMRA) were used. For consistency, the same analytical process using NPSMRA was used in the entire mediation model. Descriptive statistics are presented in Table 1.

As shown in Table 2, age was significantly correlated with gender and anxiety; however the correlation between yoga practitioner status

Table 1
Descriptive Statistics for Scale Variables.

	Yoga Practitioners (N = 301)			Total Sample (N = 367)		
Variable	*M* [95% CI]	*SD*	Range	*M* [95% CI]	*SD*	Range
Anxiety	10.01 [9.58, 10.43][a]	3.757	7 - 25	10.07 [9.68, 10.46] [a]	3.765	7–28
Avoidance	52.45 [50.54, 54.36]	16.811	31 - 113	53.68 [51.82, 55.53]	18.079	31–119
MO	29.63 [29.01, 30.25]	5.436	9 - 40	28.62 [28.01, 29.24]	5.978	9–40
MD	29.26 [28.56, 29.96]	6.165	11 – 40	28.97 [28.34, 29.60]	6.135	11–40
MAW	26.84 [26.25, 27.44]	5.255	10 - 39	26.75 [26.20, 27.30]	5.391	8–40
MNJ	26.81 [26.02, 27.61]	7.056	8 - 40	26.66 [25.94, 27.38]	7.016	8–40
MNR	22.30 [21.75, 22.85]	4.824	6 - 34	21.83 [21.32, 22.35]	4.996	6–34

Note: CI = confidence interval; MO = mindfulness observe; MD = mindfulness describe; MAW = mindfulness act with awareness; MNJ = mindfulness non-judging of experience; MNR = mindfulness non-reacting to experience.

[a] Mean anxiety levels classified as moderate according to the DASS severity ratings[36].