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ORIGINAL ARTICLE

Comparing 12-Month Outcomes for Group CBT Versus Group CBT Plus Yoga for Depression and Anxiety: a Mixed-Methods Study

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Abstract

Emerging research shows yoga, a body-based mindfulness practice, appears to augment the benefits of transdiagnostic group CBT up to 3-month post-treatment, but less is known about longer-term outcomes. This mixed-methods study reports on 12-month findings of a pragmatic preference trial with adults ($N = 59$) diagnosed with depression or anxiety. It compares longer-term outcomes between adults who completed either a group CBT program or group CBT with an adjunct therapeutic yoga program. A fixed effects linear mixed model explored symptoms of depression and anxiety (DASS-21) between the groups at 12-month follow-up (CBT alone, $n = 13$; CBT+Yoga, $n = 15$). Focus groups and semi-structured interviews were also conducted ($n = 20$) to identify what practices were maintained at follow-up. At 12-month follow-up, participants in the combined CBT+Yoga group had sustained reductions in anxiety and depression, with significantly superior outcomes when compared to those receiving group CBT alone. Qualitative data suggested that therapeutic yoga enhanced longer-term access to CBT concepts and contributed to overall increases in positive feelings and actions. Therapeutic yoga as an adjunct to group CBT appears to augment the longer-term benefits of CBT with sustained therapeutic benefits at 12 months.

Keywords Yoga · Cognitive behaviour therapy · Depression · Mood disorders · Anxiety · Mental disorders · Psychiatry · Psychotherapy · Clinical trial · Neuroscience

Key Practitioner Messages Therapeutic yoga applied alongside group CBT has the potential to improve the long-term clinical outcomes of CBT for depression and anxiety.
Yoga may be a sustainable and feasible mindfulness practice that supports people to continue to apply psychotherapy tools.

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Cognitive behaviour therapy (CBT) is the established first-line psychological treatment for both anxiety and depressive disorders (National Institute for Health and Care Excellence [NICE], 2005, 2009, 2013, 2019), with a substantial evidence-base supporting the efficacy of both individual and group-based CBT for anxiety (Carpenter et al., 2018; Hofmann et al., 2010) and depression (Cuijpers et al., 2019; Santoft et al., 2019), as well as transdiagnostic CBT protocols for anxiety and depression (Newby et al., 2015; Norton et al., 2021; Pearl & Norton, 2017; Reinholt & Krogh, 2014). CBT seeks to address unhelpful behaviour patterns and ways of thinking to ease emotional distress (Beck, 2011). For example, for people with anxiety, CBT might target cognitions relating to over-estimated appraisals of threat, as well as avoidance behaviours, which inadvertently maintain anxious symptoms (Kennerley et al., 2016). For depression, CBT interventions may focus on negatively biased appraisals of the person themselves (e.g. 'I am worthless'), the world around them (e.g. 'I can't trust others'), and their future (e.g. a sense of hopelessness), whilst also addressing behaviours, such as reduced physical activity, that reinforce depressive feelings (Kennerley et al., 2016).

Despite robust outcomes for CBT, there are people who continue to have difficulties accessing and engaging in the treatment (Corscadden et al., 2019; Marker et al., 2019; Swift & Greenberg, 2012; Young et al., 2001). Research suggests that less than half of Australian adults with a mental health disorder access treatment (Whiteford et al., 2014). Others who commence CBT fail to complete treatment (Carpenter et al., 2018; Dunlop et al., 2017) or do not receive significant benefit (Dugas et al., 2003). A recent systematic review and meta-analysis, which included data from 34 randomised controlled trials (RCTs) of CBT for adults with depression, reported a small effect size for CBT versus control conditions for adults with mild to moderate depression in primary care. However, aggregate responder and remission rates were only 49% and 45%, respectively, suggesting at least half of all adults who engage do not experience full recovery (Santoft et al., 2019). Similarly, a systematic review of 87 studies examining the treatment outcomes of CBT for anxiety disorders in adults found an average response rate to CBT of 49.5% at post-treatment and 53.6% at follow-up (Loerinc et al., 2015). Studies suggest that improvements in anxiety and depressive symptoms in patients receiving CBT typically persist between 3 and 6 months and up to 12 months for some patients, but overall, longer-term (12 months or more) follow-up data is lacking (Santoft et al., 2019; Van Dis et al., 2020).

Mindfulness practices have increasingly been incorporated into CBT protocols to improve the outcomes for people with depression and anxiety, including several adapted forms of CBT, such as acceptance and commitment therapy (Hayes et al., 1999) and mindfulness-based cognitive therapy (Segal et al., 2018), with MBCT designed specifically to prevent depressive relapse (Segal et al., 2018). Mindfulness practices are proposed to consciously cultivate conceptual, non-judgmental, and present-moment awareness (Kabat-Zinn, 1994) and, as such, are noted to complement CBT in several ways (Lang, 2013; Sipe & Eisendrath, 2012). For example, the inclusion of mindfulness practices may support people undergoing CBT to access anxious and ruminative thoughts that are then amenable to CBT tools and strategies. By drawing attention to their internal and external states, this might also support them to relate differently to their symptoms so that when they occur, their consequences are less disturbing (Benfer et al., 2021; Hofmann et al., 2010).

Yoga is a form of mindfulness practice that uses movement (postures) and breath to anchor awareness (Desikachar, 1999). It is a holistic mind-body practice combining physical postures (asana), breath regulation techniques (pranayama), plus relaxation and meditation (Desikachar et al., 2005). As a standalone therapeutic practice, yoga is shown to reduce anxiety (Cramer et al., 2018; Simon et al., 2021; Zoogman et al., 2019) and depression

(Brinsley et al., 2021; Cramer et al., 2013; Cramer et al., 2017) including amongst people with clinical levels. Emerging evidence suggests that it might be comparable to CBT for the treatment of anxiety (Brenes et al., 2020) and depression (Danhauer et al., 2022a) although findings are inclusive, with Simon et al. (2021) finding yoga to not be as effective as CBT in treating generalised anxiety disorder (GAD). Follow-up data for the impact of yoga on depression and anxiety beyond the intervention period itself is limited (Bandealy et al., 2021) but with generally favourable outcomes (e.g. Danhauer et al., 2022b; Kinser et al., 2014; Simon et al., 2021). Nevertheless, considered alongside a relatively moderate level of evidence noted in the nascent literature, at present, yoga can be best regarded as an ancillary or complementary recovery tool (Bandealy et al., 2021; Nauphal et al., 2019; Vancampfort et al., 2021).

As such, there is growing interest in how yoga, alongside other mindfulness-based interventions, might supplement psychological treatment to improve short and long-term (12-months or more) outcomes for people with mental health disorders (O'Shea et al., 2022). Notably, the underlying mechanisms purported to describe the benefits of yoga for mental health point to a range of psychological factors that are also targets of psychological therapy, such as rumination, self-compassion, and mindfulness (Pascoe et al., 2021). Furthermore, specific yoga practices, such as breath regulation and the physical movement practice, may support the sustainability of any benefits of combined programs, offering ongoing strategies for stress management (Chong et al., 2011; Mocanu et al., 2018) and behavioural activation (Capon et al., 2019), whilst there is some evidence that yoga may be a more accessible and hence sustainable mindfulness practice (Carmody & Baer, 2008; Dick et al., 2014; Kelly et al., 2021; Price et al., 2017). Two studies have examined yoga and CBT for anxiety and depression with promising findings (Khalsa et al., 2015; Vorkapic & Range, 2014); however, neither of these studies had long-term outcome data or could identify a component benefit of yoga, if any, in comparison to CBT. A third study applied a pragmatic, mixed-methods design to examine the post-test and 3-month intervention effects of therapeutic yoga delivered as an adjunct to group-based transdiagnostic CBT (CBT+Yoga), in comparison to CBT alone, for the treatment of anxiety and depression in adults attending a primary mental health clinic (O'Shea et al., 2022). Although adults in both groups demonstrated significant reductions in distress, those receiving CBT+Yoga reported significantly lower symptoms of depression and anxiety post-intervention when compared to those receiving CBT alone. Significantly lower scores for depression, but not anxiety, for adults who engaged in yoga alongside CBT compared to CBT alone, were reported at 3-month follow-up. These findings, viewed alongside qualitative data which examined the acceptability and feasibility of the CBT+Yoga intervention (Capon et al., 2021), point to the promise of therapeutic yoga as an adjunct to CBT in clinical practice for improved clinical benefits and engagement.

The current mixed-methods study reports on the long-term (12-month) follow-up data from this pragmatic preference trial (O'Shea et al., 2022), exploring how yoga might augment group transdiagnostic CBT beyond the intervention period itself, thereby addressing significant gaps in the literature. There is now considerable evidence for the acceptability and cost-effectiveness of group transdiagnostic CBT formats in clinical practice (Norton, 2022). A strength of the study was its pragmatic design, being delivered in a primary mental health clinic and aimed at understanding the acceptability and feasibility of the combined intervention in a real-world clinical setting. Pragmatic pilot designs such as this are viewed as the necessary first step to test novel interventions ahead of randomised designs, which whilst providing a higher level of evidence for clinical efficacy are more costly and do not address patient preference (Thabane et al., 2010). The primary aim was

to compare 12-month outcomes for depression and anxiety from group CBT with therapeutic yoga (CBT+Yoga), versus group CBT only. A secondary aim was to examine the perceived long-term utility of CBT tools and concepts compared to yoga tools and concepts. This was examined by asking CBT+Yoga participants which tools and concepts they maintained and which were discarded, and why, thereby triangulating quantitative findings to improve understanding and guide future clinical practice.

Method

Design

This study reports on 12-month follow-up data from a larger preferential, pre-post-follow-up, between-group study aimed at assessing the acceptability, feasibility, and preliminary efficacy of a combined group CBT and therapeutic yoga intervention, compared to group CBT alone (for full description see O'Shea et al., 2022). The trial is described following the Consolidated Standards of Reporting Trials (CONSORT) statement (Schulz et al., 2010). It was registered through the Australian and New Zealand Clinical Trials Registry (ANZCTR) (trial ID: ACTRN12620000601932).

The study followed a mixed-methods design, including (1) 12-month outcome data comparing adults who elected to engage in a therapeutic yoga program as an adjunct to their usual care for depression or anxiety (CBT+Yoga) with those who completed CBT alone (CBT) and (2) qualitative data from the subset of adults with depression or anxiety who completed the combined program (CBT+Yoga). Mixed-methods research design in health research provides for a more holistic view of the phenomena under investigation and is particularly helpful in driving evidence-based health practice (Tariq & Woodman, 2013; Wasti et al., 2022). In this study, qualitative data was used to supplement quantitative data to understand any differences in long-term outcomes between participants across the two programs. In particular, the perceived utility of CBT vs. yoga tools and concepts was examined to elucidate potential mechanisms for longer-term outcomes. In-depth analyses of participant experiences of the combined program immediately and 3 months post the intervention, applying a phenomenological framework, were reported elsewhere (Capon et al., 2021).

Participants and Procedures

Participants were recruited from a regional primary mental health service in Geelong, Australia, providing psychological therapy for adults with mild to moderate mental health presentations. Clients of the service were eligible for the study if they were diagnosed with either a depressive or anxiety disorder, established by the Structured Clinical Interview for DSM-5 (First et al., 2016), and referred to a transdiagnostic group CBT program for the treatment of depression and anxiety symptoms. All participants recruited for phase I of the trial ($n = 35$) were engaged in an 8-week transdiagnostic group CBT program and were given the choice to complete CBT only or to opt-in to an 8-week therapeutic yoga program in addition to CBT. Phase II of the trial recruited for the control group only (CBT alone) ($n = 24$) after sufficient participants (determined by *a priori* power analysis) were recruited to the intervention group.

All participants were provided with a full description of the study and plain language statement. They were informed that participation would not impact their usual care, prior to providing written informed consent. Demographic information was collected at baseline (T1). Outcome measures were collected at baseline (T1), post-intervention (T2), 3-month follow-up (T3), and 12-month follow-up (T4). Participants in the intervention group received a yoga mat upon commencement of the study, and all participants were given a $40 gift card after returning the post-intervention measures on completion of the 8-week intervention. The interventions were delivered from October 2018 through to March 2020.

At 12 months post-treatment, all participants of the study were invited to provide follow-up outcome measures as part of the consent they provided for the broader study. Those who engaged in the group CBT and self-selected into the adjunct therapeutic program (CBT+Yoga) were also invited to reflect on their ongoing use of skills and practices from either of CBT or yoga and ongoing recovery, by way of semi-structured interview or focus group, according to their preference. These were conducted by authors EH and BC, both female provisional psychologists, with training in qualitative research methods and clinical interviewing, under the supervision of the first author. Neither had a pre-existing relationship with any of the participants. One of two 60-min focus groups was offered to participants preceded by a 45-min complimentary yoga session, or a one-on-one phone interview of up to 45-min duration. Questions were guided by the Most Significant Change technique (Davies & Dart, 2004). This technique examines complex interventions and identifies changes that participants experienced as important and meaningful to them and can be used in a range of contexts, including the evaluation of health/wellbeing programs (Davies & Dart, 2004). Twelve-month follow-up questions included 'Which, if any, concepts/skills/practices are you still engaged with?' 'What is it about the concepts/skills/practices that you found helpful?' and 'What were the barriers to continuing the practice of other concepts/skills/practices?' All responses were audio recorded for later transcription and analysis.

Measures

Outcomes were assessed with the Depression Anxiety Stress Scale–21 items (DASS-21) (Lovibond & Lovibond, 1996). The DASS-21 is a self-report questionnaire which comprises three subscales of 7 items, each designed to assess depression, anxiety, and stress. Participants rate the extent to which each statement applied to them over the past week from zero (*did not apply to me at all*) to three (*applied to me very much or most of the time*). Items included statements such as 'I felt that I had nothing to look forward to' and 'I experienced breathing difficulty'. Subscale scores are calculated by summing each item and range from zero to 21, with higher scores indicating greater symptoms. A tally of all subscales provides for a total distress rating score. The DASS-21 demonstrates good test-retest reliability ($r = .91$) and high internal consistency (Cronbach's $\alpha = 0.92$; Lovibond & Lovibond, 1996). The DASS-21 demonstrates good test-retest reliability ($r = .91$) and high internal consistency (Cronbach's $\alpha = 0.92$; Lovibond & Lovibond, 1996). In the present study, internal consistency of the full scale was high (Cronbach's $\alpha = 0.92$). Reliability of the depression, anxiety, and stress subscales was also high, with Cronbach's α of 0.93, 0.85, and 0.88, respectively.

Interventions

Cognitive Behaviour Therapy

An 8-week transdiagnostic group CBT program was used as an active control condition, adapted from a manualised CBT protocol developed by the Centre of Clinical Interventions (Mood Management Course; Nathan et al., 2004). Each weekly 2-h session was facilitated by a clinical psychologist and two provisional psychologists and included content such as psychoeducation (e.g. understanding emotions and physiological sensations and factors which maintain worry or low mood), goal setting, graded exposure, behavioural activation, thought disputation, guided relaxation, and problem-solving. Participants were encouraged to practice outside of the weekly sessions.

Therapeutic Yoga Program

The therapeutic yoga program was informed by the yoga therapy framework (Desikachar, 1999; Kraftsow, 1999) and developed in accordance with consensus-based guidelines for yoga interventions for anxiety and depression (de Manincor et al., 2015). The program included eight weekly, 1-h group sessions per week with up to 10 participants. The sessions were delivered by an experienced yoga teacher and yoga therapist and included guided breathing, relaxation, meditation, and physical movement practice. Prior to commencing the group yoga therapy, each participant had a personal consultation with the yoga teacher to discuss their treatment goals and physical and mental health. Each participant received a personalised home practice of 15–30-min duration, to be undertaken at least three times a week alongside the group yoga and CBT. Adherence was encouraged via weekly reporting in a home practice log.

Data Analysis

Quantitative The study was powered with consideration to a clinically meaningful effect size of 0.8 ('large' according to Cohen's guidelines (Cohen, 1992)). Referring to Cramer et al.'s meta-analysis, the study aimed to detect a substantial between-group difference when comparing yoga with CBT to CBT alone. Using the WebPower software and the equivalence of effect sizes, it was determined that a sample size of 56 was necessary to achieve adequate statistical power (80%, alpha = .05). Further details can be found in O'Shea et al. (2022). The present study used a repeated measures fixed effects linear mixed model with between-within interactions for each outcome, and fitting linear and polynomial effects for time, to test the hypothesis that the CBT+Yoga intervention would lead to reduced symptoms in comparison to CBT alone at 12-month follow-up. We used random intercepts and clustered participants within treatment groups under the assumption that responses would be correlated within each treatment condition. Statistics were computed using Jamovi software (R Core Team, 2020; The Jamovi Project, 2021) and the GAMLj package (Galluci, 2019). The Bonferroni method was used to correct for multiple comparisons, with two within-group comparisons for each condition (12-month to baseline, and 12-month to 3-month), and one between-group comparison at 12 months. Thus, the unadjusted p values were divided by five to obtain the Bonferroni adjusted p values. As these alpha level adjustments were considered sufficient to control for Type 1 errors, we did not

control further for the assessment of four dependent variables. Examination of the DASS-21 scales (depression, anxiety, stress, and total) revealed mild skew for depression and anxiety (non-standardised skew scores of .19 and .11, respectively). The standardised skew test statistic (Zskew) was calculated as the skew statistic divided by the standard error of the skew, with results indicating that the depression and anxiety scores were skewed, but not substantially so. Thus, these scales were square-root transformed in preparation for analysis (Tabachnick & Fidell, 2013). A lack of significant interaction effects does not necessarily reflect an absence of significant and important post hoc effects (Dawson & Richter, 2006). Accordingly, in the absence of a significant interaction of time and condition, and given the exploratory nature of the data, it was considered reasonable to assess for post hoc effects despite the absence of statistically significant omnibus main effects or interactions. Hedges *G* for smaller samples was calculated for the between- and within-group differences in means and reported alongside the unadjusted 95% confidence intervals. Thus, one repeated measures fixed effects linear mixed model was run per outcome, with both the omnibus fit estimates and the associated fixed effects model coefficients reported. Each effect was tested for linear and polynomial effects, and the most suitable outcomes presented.

Qualitative A descriptive qualitative framework guided the analysis of qualitative data, which is suitable for answering specific questions about participants' experience of events, such as their ongoing use of intervention components (Sandelowski, 2000). Specifically, content analysis was applied to the semi-structured interview and focus group responses to identify the skills or practices derived from the CBT+Yoga program that participants were still engaged in and how these skills or practices were related to any ongoing benefits following Vears and Gillam's (2022) process. First, transcripts were transcribed verbatim and read in entirety to gain familiarity with the overall picture of the data. A quantitative content analysis was then applied to the data to count responses relating to skills or practices and concepts from the CBT and therapeutic yoga programs that participants reported sustaining at 12-month follow-up, using manual/hand coding. Then, a qualitative content analysis was conducted, to describe and understand these patterns of sustained practices and their effects for participants. Data was manually coded within the transcripts that is related to participant reflections on their use of skills/practices and concepts 12 months post-treatment, as well as discarded therapeutic skills/practices and concepts, using both deductive and inductive coding. Codes were then grouped into three *a priori* categories based on the key research questions, and relevant quotes were identified to represent each category. Specifically, these categories were (1) exploring sustained and discarded CBT tools and concepts, (2) exploring sustained and discarded yoga tools and concepts, and (3) CBT and yoga tools and concepts combining for long-time effects. Finally, all data was re-read to finalise the categories and develop narrative descriptions for each, triangulating the quantitative content analysis. Several processes were also followed to promote trustworthiness in the analysis in consideration to the various experience and training in CBT and yoga held by members of the research team (Lincoln & Guba, 1985). Data was independently coded in full by two members of the research team (MOS, BC) with a third coding a smaller selection of transcripts (SMc). Subsequent steps in the content analysis were undertaken by the first author (MOS), after which the research team met to discuss emerging themes and explore variations in interpretations of the data and achieve consensus as to how the data was described. This sought to achieve credibility of the findings (Graneheim & Lundman, 2004).

Reflexive Statement

All authors had varying levels of experience in yoga and/or CBT including in teaching CBT (MOS) and yoga (SMc, EH, BC, MOS, and JH). Authors HC, EH, and BC were training in clinical psychology at the time of the research being undertaken and aspects of the study formed part of their research dissertations. Authors MOS, SE, SMc, DS, and MB all had an interest and experience in clinical research examining complementary and alternative approaches to mental health. As such, all authors engaged with reflexive journaling throughout the analysis to address biases as they emerged through the process (Fischer, 2009).

Results

Quantitative Data

Of the baseline sample ($N = 59$), 27 (74% female) participants completed the DASS-21 at 12-month follow-up, representing a retention rate of 46% (CBT only, $n = 12$; CBT+Yoga, $n = 15$). Table 1 depicts descriptive characteristics for the sample at baseline and subsample at 12-month follow-up. The baseline sample is further described by O'Shea et al. (2022). Comparing the CBT only group with those in the combined program who provided data at 12 months, participants in the CBT+Yoga group had higher levels of university education (53.33% versus 25%) and higher levels of prior experience with yoga (73.33% versus 25%).

Descriptive Statistics

Comparisons of DASS-21 total and sub-scale scores between the CBT only and CBT+Yoga groups at baseline (reported previously: O'Shea et al., 2022) revealed no significant differences between the groups. Differences in the total and sub-scale scores for the DASS-21 between treatment groups at baseline (T1), post-treatment (T2), 3-month follow-up, and 12-month follow-up are shown in Table 2. At 12-month follow-up (T4), participants who engaged in the CBT only group scored in the moderate range on the anxiety and depression DASS-21 subscales and in the mild range for stress; those who participated in the CBT+Yoga intervention scored in the normal range for all DASS-21 subscales.

Linear interactions between time and treatment groups for the DASS-21 total score and subscales were examined over T1, T2, T3, and T4. All linear models accounted for a significant portion of the variance in each of the outcomes (depression: $R^2_{\text{Marginal}} = .202$, $z = 2.32$, $p = .019$; anxiety: $R^2_{\text{Marginal}} = .235$, $z = 2.575$, $p = .010$; stress: $R^2_{\text{Marginal}} = .161$, $z = 1.95$, $p = .045$; DASS-21 total score: $R^2_{\text{Marginal}} = .231$, $z = 2.58$, $p = .009$).

Linear Mixed Model—Depression Symptoms (Tables 3 and 4 and Fig. 1)

The linear model for depression revealed significant effects of time and group, with a significant improvement in depression over time and for the groups overall [$F(3, 111.6) = 14.38$, $p < .001$]. Significantly greater improvements in depression were observed for the CBT+Yoga group over time [$F(1, 57.6) = 10.38$, $p = .002$]. No significant interaction effects were detected between treatment condition and time [$F(3, 111.6) = 1.14$, $p = .337$].

Table 1 Demographic characteristics of the participants at baseline ($N = 59$) and subsample at 12-month follow-up (quantitative measures, $n = 27$)

	Baseline		12-months	
	CBT only ($n = 27$)	CBT+Yoga ($n = 32$)	CBT only ($n = 12$)	CBT+Yoga ($n = 15$)
Age (years)	$M = 38.75$	$M = 40.42$	$M = 39.75$	$M = 44$
	SD = 16.84	SD = 13.45	SD = 17.75	SD = 12.51
	n (%)	*n* (%)	*n* (%)	*n* (%)
Gender				
Male	8 (29.60)	8 (25)	4 (33.33)	3 (20)
Female	18 (66.70)	24 (75)	8 (66.67)	12 (80)
Other	1 (3.70)	0 (0)	0 (0)	0 (0)
Country of birth				
Australia	22 (81.48)	32 (100)	11 (91.67)	15 (100)
Other	5 (18.52)	0 (0)	1 (8.33)	0 (0)
Highest qualification completed				
University degree	6 (22.22)	11 (34.38)	3 (25.00)	8 (53.33)
Diploma/apprenticeship	7 (25.93)	10 (31.25)	3 (25.00)	5 (33.33)
High school, VCE equivalent	9 (33.33)	7 (21.88)	5 (41.67)	1 (6.67)
No formal qualifications	5 (18.52)	4 (12.50)	1 (8.33)	1 (6.67)
Employment				
Unemployed	20 (74.10)	17 (53.10)	8 (66.67)	8 (53.33)
Part time/casual	6 (22.20)	9 (28.15)	3 (25.00)	3 (20.00)
Full-time	1 (3.7)	6 (18.75)	0 (0)	4 (26.67)
Other mental health conditions impacting daily functioning	2 (7.41)	2 (6.25)	0 (0)	0 (0)
Physical conditions impacting daily functioning	11 (40.74%)	14 (43.75)	6 (50.00)	7 (46.66)
Prior experience with yoga	10 (37.04%)	17 (53.13%)	3 (25.00%)	11 (73.33%)

M, mean; *SD*, standard deviation

Table 2 Differences between groups on DASS-21 outcome scores at baseline (T1), T2, T3, and 12-month follow-up

	T1				T2				T3				T4			
	CBT only	CBT+ Yoga	Signifi-cance		CBT only	CBT+ Yoga	Significance		CBT only	CBT+ Yoga	Significance		CBT only	CBT+ Yoga	Signifi-cance	
	M (SD)	*M* (SD)	MD	*p*	*M* (SD)	*M* (SD)	MD	*p*	*M* (SD)	*M* (SD)	MD	*p*	*M* (SD)	*M* (SD)	MD	*p*
DASS-21 total score	67.74 (25.01)	56.25 (23.41)	8.49	.165	47.48 (23.59)	31.85 (21.32)	15.00	**.020**	40.93 (17.82)	27.62 (24.77)	13.55	.055	48.17 (24.96)	25.33 (12.44)	18.90	**.014**
Depres-sion	23.56 (11.32)	17.87 (12.18)	5.68	.07	16.78 (9.72)	10.30 (10.27)	5.88	**.050**	16.53 (10.32)	8.67 (9.58)	7.82	**.019**	17.67 (11.87)	5.60 (5.19)	9.697	**.008**
Anxiety	18.67 (8.43)	17.00 (9.37)	1.67	.444	13.83 (7.91)	8.89 (8.53)	4.72	**.039**	8.13 (5.78)	7.33 (8.59)	2.02	.410	12.67 (7.5)	7.20 (5.33)	5.27	**.046**
Stress	22.52 (9.98)	21.38 (8.83)	1.14	.618	16.87 (9.2)	12.67 (7.1)	4.42	.070	16.27 (6.23)	11.62 (8.71)	3.86	.156	17.83 (9.74)	12.53 (7.73)	4.13	.165

Significance testing through two-tailed *t*-tests, either paired sample or independent sample, as indicated by the comparison

M, mean; *MD*, mean difference; *SD*, standard deviation

Table 3 Fixed parameter estimates for depression scores

Fixed effects parameter estimates							
Effect	Estimate	SE	95% CI				
			Lower	Upper	*df*	*t*	*p*
(Intercept)	3.473	0.178	3.124	3.822	57.6	19.498	< .001
Group	− 0.932	0.175	− 1.275	− 0.589	115.6	− 5.331	< .001
Time	0.330	0.163	0.010	0.650	109.2	2.019	.046
Group*time	− 0.634	0.350	− 1.319	0.052	115.6	− 1.812	.073

df, degrees of freedom; *SD*, standard deviation; *SE*, standard error

Table 4 Post hoc comparisons between groups for depression scores

Group	Time	Group	Time	Difference	SE	*t*	*df*	$p_{\text{Bonferroni}}$	Hedges *G* 95%CI
CBT	1	CBT	4	0.928	0.366	2.533	115.8	.065	2.43 [1.72, 3.15]
CBT	3	CBT	4	0.138	0.399	0.346	111.9	1	0.33 [− 0.46, 1.11]
CBT	4	CBT+Yoga	4	1.574	0.521	3.021	151.3	**.015**	2.84 [1.82, 3.86]
CBT+Yoga	1	CBT+Yoga	4	1.755	0.330	5.319	116.2	**.002**	5.14 [4.5, 5.79]
CBT+Yoga	3	CBT+Yoga	4	0.399	0.343	1.165	109.9	1	1.11 [0.44, 1.78]

df, degrees of freedom; *SE*, standard error

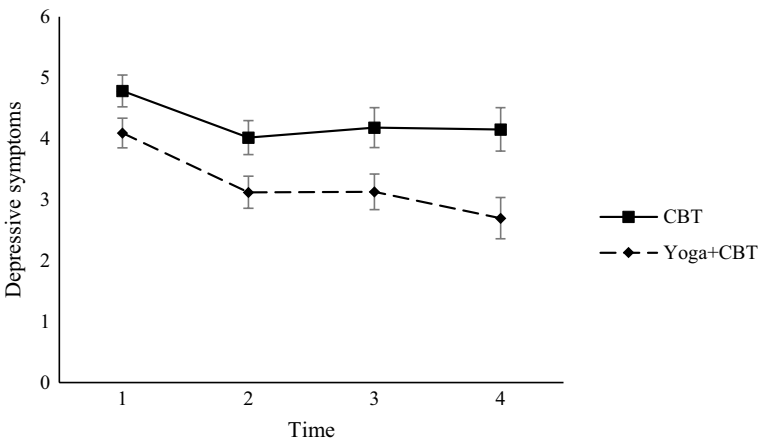

Fig. 1 Depressive symptoms over time

When examining post hoc simple effects (Table 4), a significant within-groups effect was observed for the CBT+Yoga group from baseline (T1) to 12-month follow-up (T4), but not for the CBT only group.

Table 5 Fixed parameter estimates for anxiety scores

Fixed effects parameter estimates							
Effect	Estimate	SE	95% CI				
			Lower	Upper	*df*	*t*	*p*
(Intercept)	3.140	0.149	2.848	3.431	60.2	21.124	< .001
Group	− 0.912	0.132	− 1.171	− 0.654	116.2	− 6.915	< .001
Time (linear)	0.660	0.123	0.419	0.901	111.0	5.370	< .001
Time (quadratic)	0.146	0.121	− 0.090	0.382	111.5	1.212	.228
Group*time	− 0.418	0.264	− 0.935	0.099	116.2	− 1.584	.116

df, degrees of freedom; *SE*, standard error

Table 6 Post hoc comparisons between groups for anxiety scores

Group	Time	Group	Time	Difference	SE	*t*	*df*	$p_{Bonferroni}$	Hedges *G* 95% CI
CBT	1	CBT	4	0.778	0.276	2.817	114.2	**.016**	2.71 [2.17, 3.25]
CBT	3	CBT	4	− 0.677	0.300	− 2.256	110.9	.14	− 2.12 [− 2.71, -1.54]
CBT	4	CBT+Yoga	4	1.060	0.413	2.567	143.4	.061	2.42 [1.61, 3.23]
CBT+Yoga	1	CBT+Yoga	4	1.539	0.249	6.190	114.6	**.002**	5.98 [5.49, 6.47]
CBT+Yoga	3	CBT+Yoga	4	− 0.088	0.258	− 0.340	109.2	1	− 0.33 [− 0.83, 0.18]

df, degrees of freedom; *SD*, standard deviation; *SE*, standard error

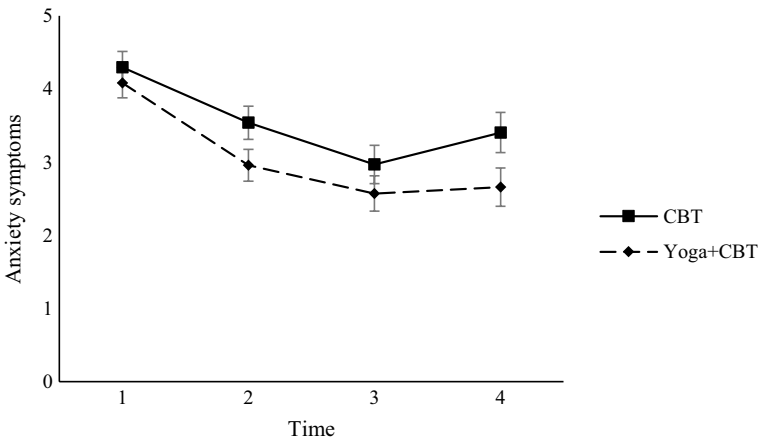

Fig. 2 Anxiety symptoms over time

Table 7 Fixed parameter estimates for stress scores

Fixed effects parameter estimates							
Effect	Estimate	SE	95% CI				
			Lower	Upper	*df*	*t*	*p*
(Intercept)	16.785	1.009	14.81	18.763	57.5	16.633	< .001
Group	− 3.388	2.018	− 7.34	0.568	57.5	− 1.679	.099
Time (linear)	− 4.405	0.997	− 6.36	− 2.451	115.6	− 4.418	< .001
Time (quadratic)	4.097	0.931	2.27	5.922	109.1	4.399	< .001
Group*time	− 1.876	1.994	− 5.78	2.032	115.6	− 0.941	.349

df, degrees of freedom; *SE*, standard error

Table 8 Post hoc comparisons between groups for stress scores

Group	Time	Group	Time	Difference	SE	*t*	*df*	$p_{Bonferroni}$	Hedges *G* 95% CI
CBT	1	CBT	4	4.734	2.09	2.266	115.9	.07	2.17 [− 1.92, 6.27]
CBT	3	CBT	4	− 1.628	2.28	− 0.716	112.0	1	− 0.67 [− 5.14, 3.8]
CBT	4	CBT+Yoga	4	4.128	2.96	1.394	151.8	.458	1.31 [− 4.49, 7.11]
CBT+Yoga	1	CBT+Yoga	4	7.718	1.88	4.103	116.3	**.002**	3.97 [0.29, 7.65]
CBT+Yoga	3	CBT+Yoga	4	− 1.360	1.95	− 0.696	110.0	1	− 0.67 [− 4.49, 3.15]

df, degrees of freedom; *SE*, standard error

The CBT+Yoga group demonstrated significant improvement in levels of depression from baseline to 12-month follow-up, in addition to significantly lower levels of depression at follow-up (T4) compared to the CBT only group. Neither group showed significant change in depression symptoms from 3-month (T3) to 12-month follow-up (T4), although trend findings (see Fig. 1) suggest that participants in the CBT+Yoga group see ongoing and sustained improvements in depression post-intervention, including from three (T3) to 12-month follow-up (T4).

Linear Mixed Model—Anxiety Symptoms (Tables 5 and 6 and Fig. 2)

Linear mixed modelling for anxiety also revealed significant effects for time and treatment group, with both groups showing significant reductions in anxiety over the intervention and follow-up period [$F(3, 113) = 32.77$, $p < .001$]. Greater improvements in anxiety symptoms were demonstrated for participants in the CBT+Yoga group at

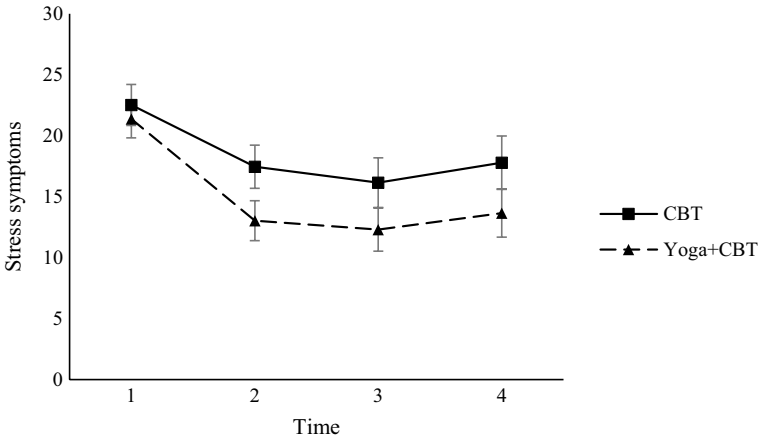

Fig. 3 Stress symptoms over time

follow-up [$F(1, 60.2) = 5.21$, $p = .026$]. No significant interaction effects were detected between treatment condition and time [$F(3, 113) = 2.17$, $p = .096$].

Examination of post hoc simple effects revealed significant within-group time effects from baseline (T1) to 12-month follow-up (T4) for both treatment groups, with both groups demonstrating significant improvements in anxiety at long-term follow-up. Neither treatment group demonstrated significant changes in anxiety symptoms from three (T3) to 12-month follow-up (T4).

However, in a similar pattern to depressive symptoms over time, the CBT group showed a trend to increasing anxiety symptoms at 12-month follow-up, whilst the CBT+Yoga group appeared to maintain the improvements shown at 3-months (Fig. 2).

Linear Mixed Model—Stress Symptoms (Tables 7 and 8 and Fig. 3)

Linear mixed modelling for stress revealed a significant effect of time [$F(3, 111.6) = 17.97$, $p < .001$], but not treatment allocation [$F(1, 57.5) = 2.81$, $p = .099$], nor an interaction between treatment condition and time [$F(3, 111.6) = 0.873$, $p = .457$].

Table 9 Fixed parameter estimates for total DASS-21 scores

Fixed effects parameter estimates							
Effect	Estimate	SE	95% CI				
			Lower	Upper	*df*	*t*	*p*
(Intercept)	43.970	2.75	38.58	49.36	57.5	15.997	< .001
Group	− 13.987	5.50	− 24.76	− 3.21	57.5	− 2.544	.014
Time (linear)	− 15.806	2.39	− 20.50	− 11.11	113.4	− 6.601	< .001
Time (quadratic)	10.953	2.23	6.58	15.32	108.3	4.914	< .001
Group*time	− 6.662	4.79	− 16.05	2.72	113.4	− 1.391	.167

df, degrees of freedom; *SD*, standard deviation; *SE*, standard error

Table 10 Post hoc comparisons between groups for total DASS-21 scores

Group	Time	Group	Time	Difference	SE	*t*	*df*	$p_{Bonferroni}$	Hedges *G* 95%CI
CBT	1	CBT	4	16.891	5.01	3.3704	113.9	**.005**	3.24 [−6.58, 13.06]
CBT	3	CBT	4	− 4.776	5.45	− 0.8770	110.7	1	− 0.82 [− 11.51, 9.86]
CBT	4	CBT+Yoga	4	18.904	7.57	2.4975	141.7	.04	2.35 [− 12.49, 17.19]
CBT+Yoga	1	CBT+Yoga	4	27.304	4.51	6.0495	114.4	**.005**	5.85 [− 2.99, 14.69]
CBT+Yoga	3	CBT+Yoga	4	0.573	4.67	0.1225	109.1	1	0.12 [− 9.04, 9.27]

df, degrees of freedom; *SE*, standard error

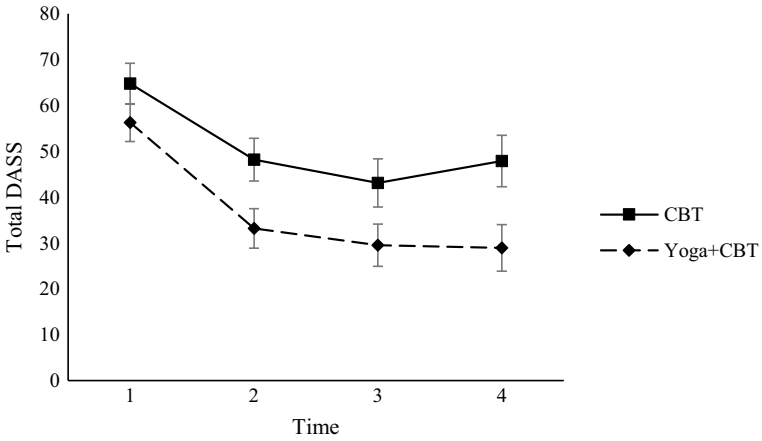

Fig. 4 DASS-21 total symptoms over time

However, post hoc within-group analyses revealed a significant reduction in stress for participants in the CBT+Yoga condition from baseline (T1) to 12-month follow-up (T4) ($p = .002$), with no significant difference shown for participants in the CBT only group. Examination of Fig. 3 suggests that levels of reported stress for participants in both the CBT only group and CBT+Yoga group declined post-intervention, with lower levels of reported stress maintained from 3- to 12-month follow-up. No significant between-group difference in stress was detected at follow-up (T4).

Linear Mixed Model—DASS-21 Total Symptoms (Tables 9 and 10 and Fig. 4)

Examination of the fixed effects parameter estimates for total DASS-21 scores revealed similar results to those found for linear models for sub-scale scores. Significant linear effects of time [$F(3, 110.3) = 30.6$, $p < .001$] and treatment allocation [$F(1, 57.5) = 6.474$, $p = .014$] were shown for total DASS-21 scores, with participants in both CBT

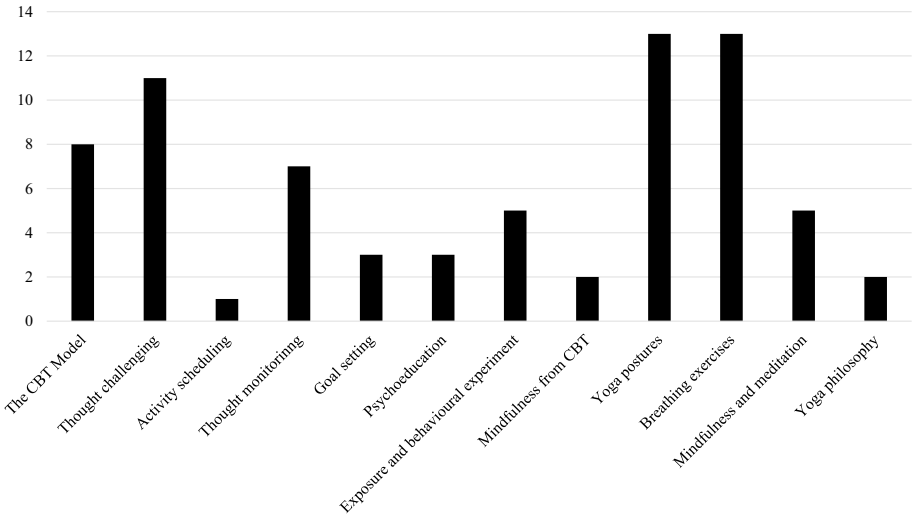

Fig. 5 Sustained tools and concepts from the combined yoga and CBT program

alone and CBT+Yoga reporting improvements in overall distress across the follow-up observations with these improvements being significantly better for those in the CBT+Yoga group than the CBT only group (conditional linear effects of time: $B = -19.13$, $t(113) = -5.99$, $p < .001$ and $B = -12.47$, $t(113) = -3.49$, $p < .001$, respectively). No significant interaction effects were detected between treatment condition and time [$F(3, 110.3) = 0.957$, $p = .416$].

Examination of post hoc comparisons showed significant within group effects for both the CBT only and CBT+Yoga groups from baseline (T1) to 12-month follow-up (T4), with significant reductions in overall distress at 12-month follow-up for participants in both the CBT only and CBT+Yoga groups. Distress scores at 12-month follow-up were significantly lower for participants in the combined program. Neither condition showed a significant change in DASS-21 total symptoms from three (T3) to 12-month follow-up (T4).

Qualitative Analysis

The qualitative data obtained from 20 participants via either focus group ($n = 6$; (P4, P11, P08, P09, P16, and P17) or semi-structured interview ($n = 14$, remaining participants) sought to respond to two main research questions. First, quantitative content analysis identified CBT and yoga skills and concepts that were sustained at follow-up (Fig. 5). Over half of all participants reported retaining a yoga practice of some kind 12 months after completing the intervention, typically a physical practice and/or breathing exercises (pranayama). In contrast, few participants reported maintaining mindfulness or meditative practices or concepts from yogic philosophy. Considering CBT, just under half recalled the use of the CBT model as being drawn on at 12-month follow-up, and around one-third specifically noted the value of thought challenging or monitoring of some form. Contrastingly, other specific CBT tools such as goal setting and exposure were least often reported as having utility at 12-month follow-up.

Table 11 Perspectives on sustained practices and concepts: qualitative content analysis

Exploring sustained and discarded CBT tools and concepts	'I think I've ended up with a little less absolutes and negatives in the sort of self-statements. I think I can question them a bit more now [P11]'
	'When I write things down I can see, like I can see it more rationally rather than when it's in my head… (and) I realise it's an irrational thought… (that) helps me to feel better and realise that it is not something I need to be worried about most of the time… (I) just keep doing it because it's one of the only things that really works for me' [P13]
	'CBT skills I do use a bit… learning to sit in that little discomfort part rather than trying to quickly run away from it or get myself out of there, like, sort of learning to face your fears a little bit' [P4]
	'I don't really even think about it anyway, because I've done it so often, using this process (challenging unhelpful thinking)… it's just second nature to me now' [P15]
	'I've learnt from it (CBT)… ways to look at things differently. Like, I'm a big overthinker kind of, so like, when someone says something I can think the worst… (but now) I have a different perspective about it. I guess that is quite important cos now I'm not thinking the worst all the time like I was… (I am) getting out more and hanging out more with friends, which is good for my mental health and my social health. The different styles of thinking… I guess that's one I use every day without knowing it' [P40]
	'(I am) just continuing that practice of being self-aware… what my feelings are, what my thoughts are…and the more you practice those techniques that more it just comes natural… after practicing it so long it's actually ingrained a lot more.' [P32]

Table 11 (continued)

Exploring sustained and discarded yoga tools and concepts	'I like the movement side of it, like, I just found that when you're really focusing on the poses and things, it just really takes you out of your head.' [P4] 'I've (still) been using the breathing… as a tool to either get to sleep, relax or to slow down… and process before reacting to a situation.' [P10] '… the yoga, I've kept doing that cos I found, like, it enjoyable which was good. Like, I liked doing it and I found the breathing, really, um helpful as well – breathing through the movements… and just focusing on that instead of just everything that's going on in my head (laughing). I guess it's just good for my mental health to do stuff that I find enjoyable. Afterwards I'm always like, I'm glad I did that because I feel so much better for it. I guess just like, kind of that mentality to, like, how you feel after it. You want to keep going because you see that it works' [P40] 'I don't find (meditation) that helpful, personally just sitting there… you know… in silence. That's where I find the yoga helpful. I find it more helpful to move' [P40] 'Breathing's a really big one for me, like, just bringing it back to, like, my breathing. I sort of start to get a bit anxious… I just put in some breathing, which I've got skilled enough now that I can do it and no-one would even know I was doing it. Um, I can often just put the brakes on it…' [P4] 'I definitely notice the difference when I don't do yoga… I am just like a completely different person with yoga, yeah, I'm more aware, and alive and happy…' [P8] 'I remember (our yoga teacher) said 'imagine you have a string on your head and stand tall. And that, what that does is it lifts your chin up and put your chest out, put your shoulders back, stand tall'… she always said that… and 'put your shoulders down, or relax them'. I've found in counselling that's one of the main objectives. I've found that you need to think of yourself as tall, not small… You feel as tall as a mountain' [P17] 'I still do yoga a couple of times a week… it is the relaxation but it is (also) that calming of the mind.' [P39]

Table 11 (continued)

Understanding the sustained benefits of CBT and yoga	'Well, I find the yoga calms me down enough that I can then, um, like, kind of access some of the CBT strategies, like you know, cos it's put me in a much calmer sort of state where I'm a bit more rational […] I think the CBT and the yoga was .. interconnected. It was like a melding of the two and they kind of completed each other' [P4] 'When I'm getting overwhelmed, it's now remembering to breath first and then I can, um, bring myself back by using the senses, what's around me, and then I can challenge the thoughts that are going through my head' [P15] 'The yoga kind of helps me more with my, like, energy… just kind of like staying in the moment more… whereas, like, CBT it helps me more with strategies when I do actually, like have those negative moments or anxiety or whatever, negative head talk, you know, that just keeps going on… The CBT has helped with that. The yoga, it (also) kind of helped me to know that I'm okay and that I, like, deserve the time… (laughs)' [P5] '… they (CBT and Yoga) go hand in hand. What ties it together is yoga… (as it) makes you more aware of how you feel physically.' [P9] 'Breathing every night and the (yoga) exercises every night, plus (doing) the homework we got from CBT… in a way rewired our brains a little bit along the way… and our bodies, and combined it all together. Yes, so it's just behaviour, changing your (mental) habits and your behaviours all at the same time.' [P9]

*P1–P40 refer to participant IDs

The second research question was addressed by the qualitative analysis related to the participants' perspectives as to why certain skills/practices and concepts were retained and others discarded, with a focus on how retained tools and concepts were viewed by participants as linked with long-term outcomes. Qualitative content analysis elaborated the three a priori categories to address this research question: (1) exploring sustained and discarded CBT tools and concepts, (2) exploring sustained and discarded yoga tools and concepts, and (3) CBT and yoga tools and concepts combining for long-time effects (titled *Understanding the sustained benefits of CBT and yoga*). Illustrative quotes for each category are provided in Table 11, and each category is narratively described below.

Exploring Sustained and Discarded CBT Tools and Concepts

Whilst many participants could identify specific CBT tools and concepts that they continued to use 12 months after their participation in the combined program, such as thought challenging and goal setting, for most, their engagement with CBT was described as fundamentally changing their internal worlds and mindsets. Concepts such as the understanding that previously held beliefs about themselves might not be accurate and that thinking patterns that are unhelpful can be noticed and abandoned were viewed as having been transformative, and once learned could not be unlearned, creating new unconscious mental patterns. Only a small minority of participants dismissed an ongoing use of CBT tools and concepts, with these participants attributing this to a preference against 'delving into things' in their daily life, viewed as a necessary component of CBT.

Exploring Sustained and Discarded Yoga Tools and Concepts

In contrast, yoga tools and practices, such as asana, were noted to be engaged in consciously and with intention. Breathing exercises and the physical yoga practice were most often cited by participants as practices they sustained over time. The portability of breathing exercises to draw on in moments of stress or high arousal was ongoingly valued. The physical yoga practice also supported participants to be more aware of their present environment, deterring them from anxiety triggers, whilst also contributing to physical flexibility and strength and supporting these participants to connect to physical pleasure and embodiment. Notably, around half of participants maintained a regular yoga practice of some kind, most often a home practice, with a number of those who had let their practice lapse, describing a pull to re-connect with it. These participants reflected that they valued the combination of movement with mindfulness and the positive feelings that their yoga practice brought them. Of the factors they identified as barriers to re-engagement, competing demands and financial barriers were most often identified. Participants reflected that they missed the motivating effect of the group and acknowledged that it was important that they learnt to build yoga into their self-care routines. Only two participants reflected that they had found the yoga component of the program unappealing, remarking that it was insufficiently physically challenging for them and too 'esoteric'.

Understanding the Sustained Benefits of CBT and Yoga

In considering the enhanced outcomes for participants who engaged in therapeutic yoga alongside CBT, participants were asked about how, if at all, practices across the two

modalities combined to support their recovery. Overall, participants strongly agreed that their engagement in yoga continued to enhance the benefits of CBT. They described how yoga tools and practices contributed to create a calmer and more focussed state of mind to draw on and use CBT tools and concepts they retained from their engagement in the combined intervention. Many noted that they continued to value the physical aspects of yoga which they saw as building strength and confidence, and in doing so, supported CBT tools they might be using to dispel negative self-beliefs, address low motivation, or tackle feared situations. Alongside, several participants reflected on positive feeling states that accompanied yoga, reinforcing an emphasis in CBT to find sources of positive emotions, including joy and happiness. Others reflected that yoga represented a form of self-care, emphasised in CBT, but otherwise difficult to prioritise. Notably, compared to mindfulness taught in CBT or learnt in other forums, many participants spoke of a lasting preference for yoga tools and practices, particularly the focussed movement of the body with breath. Participants described that this form of mindfulness could be engaged with more easily when compared to more quiet and contemplative mindfulness practices such as a body scan, for example. It was less likely to draw attention to anxious or ruminative thoughts participants might still struggle with from time to time.

Discussion

This study is the first to examine long-term outcomes for a combined group CBT and therapeutic yoga program compared to CBT alone, following interest in the inclusion of mindfulness-based interventions to support longer-term outcomes of CBT for depression, in particular (Segal et al., 2018). Our findings support the long-term benefits of CBT for anxiety (Van Dis et al., 2020), but do not provide additional support for the long-term benefits of group CBT for depression (Zhang & Yuan, 2018) or stress. Significant improvements were observed in anxiety and overall DASS-21 scores at 12-month follow-up for participants attending the group CBT program, but there were no significant differences in scores on depression or stress at 12-months when compared to baseline. In contrast, significant improvements in scores on all DASS-21 subscales and the overall DASS-21 distress score, found directly at post-test and at 3-month follow-up of the combined CBT and yoga program (O'Shea et al., 2022), were sustained at 12-month follow-up. Specifically, results showed significantly better clinical outcomes for participants in this combined program when compared to the CBT only group at the long-term follow-up on self-reported depression and overall DASS-21 symptoms. These findings suggest that the application of therapeutic yoga as an adjunct to CBT promotes sustained improvements in anxiety and depression. Thus, we support limited research findings that highlight the benefits of yoga when combined with CBT for depression and anxiety (Khalsa et al., 2015; O'Shea et al., 2022; Vorkapic & Range, 2014).

The finding that yoga may augment CBT to improve long-term outcomes for depression is important. As noted, rates of relapse in adults with depression who complete a course of CBT are around 50%, meaning that up to one in two people will go on to experience a subsequent episode of depression (Santoft et al., 2019), contributing to additional functional and symptomatic burden as well as increased healthcare costs (World Health Organisation, 2017). Qualitative findings from the study suggest that yoga might uniquely complement CBT to improve long-term outcomes for depression. Notably, many of the participants were able to sustain some form of yoga practice over the follow-up period,

with many remarking that the practice represented an antidote to cycles of inactivity that would previously have burdened them, as well as being a form of accessible exercise that promoted positive feeling states and reduced stress. Combined with the relative popularity and accessibility of yoga (Brenes et al., 2020; Brinsley et al., 2021; Simon et al., 2021; Zoogman et al., 2019), including the option for home practice, these reflections suggest that yoga may be a particularly useful adjunct to CBT for depression, promoting sustained behavioural activation in a social context and increasing longer-term pleasure. This finding is consistent with the broader evidence for the mechanisms of action for yoga, relevant to depression, including its impact on reducing rumination and increasing mindfulness (La Rocque et al., 2021; West et al., 2021), reducing stress reactivity (Pascoe et al., 2021), and incorporating the broader benefits of gentle exercise (Pascoe et al., 2021), and the promotion of other lifestyle modifications associated with combatting depression (Tolahunase et al., 2021).

We also examined the reflections made by participants as to the tools and concepts from both CBT and yoga that they retained 12 months on, and how these did or did not contribute to ongoing clinical improvements they noticed in themselves to further understanding of how CBT and yoga might combine to contribute to long term benefits amongst people with anxiety and depression. In general, these reflections indicated that CBT was a key part of many participants' ongoing recovery, whereby previous thinking patterns which habitually resulted in anxious or depressive states were able to be identified and either discarded or substituted with more helpful ones more easily over time, reflecting key mechanisms for the therapeutic benefit of CBT (Kennerley et al., 2016). Tools and concepts common to CBT including the CBT model, thought monitoring and thought challenging (Beck, 2011), were viewed as particularly useful and still drawn upon often. Importantly, participants agreed that an ongoing physical yoga practice provided a lasting method to develop mindful attention to their thoughts and feelings and promote a greater sense of calm, allowing for these new ways of thinking to be adopted and benefited from. Breath regulation techniques taught in the yoga program were also commonly referenced as portable and sustainable tool for mental health.

Taken together, these findings add to the emerging discourse regarding the complementary nature of yoga and CBT (Caplan et al., 2013; Ware, 2007: Khalsa et al., 2015), as well as the utility of other enhanced CBT protocols incorporating mindfulness-based practices, such as MBCT (Segal et al., 2018), aimed at augmenting and sustaining clinical outcomes associated with CBT alone. Yoga, being a movement-based mindfulness practice, has been found to be a more accessible form of mindfulness practice than other contemplative mindfulness practices (Carmody & Baer, 2008; Dick et al., 2014; Kelly et al., 2021; Price et al., 2017) and associated with improvements in related mindfulness constructs viewed as helpful in ameliorating anxiety and depression (Pascoe et al., 2021). As such, it holds promise as an adjunct to CBT for individuals who find other mindfulness practices challenging. Of note, whilst many participants did express a preference for yoga as a means to anchor their attention over other forms of mindfulness and meditative contemplation, a number found that they were attracted to new forms of mindfulness practice as time went on, holding promise that yoga can be an entry point for other mindfulness practices and associated psychological benefits (Bowles et al., 2022; Keng et al., 2011). Finally, a small number of participants reported that they did not find ongoing value in either of CBT or yoga practices, highlighting the need for diverse treatment approaches that allow for patient choice and are consistent with key principals of personalised medicine (Windle et al., 2020).

Limitations and Future Directions

Despite a number of strengths of this novel study, including it being the first to examine the comparative long-term effects of a combined CBT and therapeutic yoga program versus standard group CBT delivered in a single clinical setting, findings should be considered in view of various limitations, in addition to those cited in our original outcomes study (O'Shea et al., 2022). Firstly, although powered to detect anticipated effects of the therapeutic programs of interest here, the sample size was moderate, with around 50% attrition in both conditions to the 12-month follow-up. The need for follow-up beyond 6 months has been noted in similar trials (e.g. Danhauer et al., 2022a) but is hampered by the nature of trials in real-world settings, including higher attrition associated with recruitment in clinical settings (Lam et al., 2022). Accommodating for the possibility that the missing data was unlikely to be missing completely at random, we applied caution in our analytic approach, consistent with commentaries relating to the analysis of longitudinal data (Gibbons et al., 2010). Men were also unrepresented in the study, making up only 25% of the CBT+Yoga group and 30% of the CBT group, noting that these rates reflect the typical mix of genders in clinical practice (Park et al., 2019) and the need to increase men's participation in both psychotherapy (Seidler et al., 2020) and yoga (McIver et al., 2022).

Importantly, we also applied a pragmatic, preference design since acceptability and feasibility data was of primary relevance (Thabane et al., 2010). This enhances the real-world translation of our findings (Simon et al., 2021) and is broadly accepted as the early stage of testing new clinical interventions (Thabane et al., 2010). Nevertheless, as such, outcomes were focussed on those used within the clinical setting to avoid additional participant burden on the clinical sample, i.e. the DASS-21 over other outcome measures used in related research such as the BDI (Beck et al., 1996) or the Hamilton Rating Scale for Depression; HRSD, Hamilton, 1960). The DASS-21 does have the advantage of assessing across the domains of anxiety, stress, and depression in a single measure and has been used in other Australian clinical trials (Francis et al., 2019; Hewett et al., 2018). We also used a mixed population of anxious and depressed patients according to the movement towards trans-diagnostic interventions in clinical settings, which does not allow for relative elucidation of effects for participants with anxiety or depression or a mixed clinical presentation. Nevertheless, there is good evidence for the efficacy of transdiagnostic CBT for both anxiety and depression, and it is increasingly adopted in clinical practice, addressing limitations of diagnostic specific CBT (Norton et al., 2021). Most importantly, a pragmatic preference design, which allows for participants to elect which intervention they engage in, as they do in real-world clinical settings, means that it is possible that preference effects account for the findings here. To accommodate for preferences of participants within the primary mental health setting, the CBT+Yoga condition was implemented ahead of the CBT only condition. We note that we did not perform a cluster analysis beyond treatment allocation. However, our sample size was comparatively small, the trial occurred at a single site, a single yoga therapist delivered the yoga intervention, and the manualised CBT groups were delivered under supervision, thus reducing the risk of inter-cluster differences. As such, including further clustering within the models was likely to risk non-convergence and subsequent biased output (McNeish & Harring, 2017). We also note that participants who completed the combined program and provided 12-month data were more likely to have had exposure to yoga before joining the treatment trial and higher levels of education. The impact of preference on outcomes for yoga and CBT interventions has been recently examined, including up to 6 months post-treatment (Szuhany et al., 2022; Brenes et al., 2020; Danhauer et al., 2022a, 2022b). Notably, these findings failed to identify preference effects, suggesting

that people with anxiety and depression predisposed to yoga as a treatment modality were as likely to experience benefit as those who were showed a preference for CBT. Nevertheless, in consideration to these limitations, our findings remain preliminary ahead of further research adopting randomised trial design. Future research might also extend this study's findings to include a yoga only treatment arm and, in doing so, examine the relative component benefits of CBT in comparison to yoga.

Conclusions

This study builds on the nascent literature supporting a role for using therapeutic yoga to enhance clinical benefits of CBT. Importantly, it suggests that delivering a therapeutic yoga program alongside group transdiagnostic CBT in a primary mental health setting has the potential to improve the long-term clinical outcomes of CBT for depression and anxiety. Yoga provides a sustainable and feasible mindfulness practice that supports people to identify and better manage unhelpful thinking patterns and increase positive feelings states. Future research with larger numbers is encouraged, in addition to applying a randomised rather than pragmatic preference trial design, building on the preliminary feasibility and efficacy work undertaken in the present study.

Author Contributions MO, SE, SM, HC, and MB contributed to the study conception and design. Material preparation and data collection were performed by BC and EH, and analysis was performed by MO, DS, EH, BC, and SM. The first draft of the manuscript was written by MO, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Declarations

Ethical Approval The Hospital ethics committee granted approval (Barwon Health, Protocol number 18/102). Participants provided written consent.

Conflict of Interest The authors declare no competing interests.

References

Bandealy, S. S., Sheth, N. C., Matuella, S. K., Chaikind, J. R., Oliva, I. A., Philip, S. R., et al. (2021). Mind-body interventions for anxiety disorders: a review of the evidence base for mental health practitioners. *Focus, 19*(2), 173–183. https://doi.org/10.1176/appi.focus.20200042

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. Psychological Corporation.

Beck, J. S. (2011). *Cognitive behavior therapy: basics and beyond* (2nd ed.). Guilford Press.

Benfer, N., Spitzer, E. G., & Bardeen, J. R. (2021). Efficacy of third wave cognitive behavioral therapies in the treatment of posttraumatic stress: a meta-analytic study. *Journal of Anxiety Disorders, 78*, 102360. https://doi.org/10.1016/j.janxdis.2021.102360

Bowles, N. I., Davies, J. N., & Van Dam, N. T. (2022). Dose–response relationship of reported lifetime meditation practice with mental health and wellbeing: a cross-sectional study. *Mindfulness, 2022*. https://doi.org/10.1007/s12671-022-01977-6

Brenes, G. A., Divers, J., Miller, M. E., Anderson, A., Hargis, G., & Danhauer, S. C. (2020). Comparison of cognitive-behavioral therapy and yoga for the treatment of late-life worry: a randomized preference trial. *Depression and Anxiety, 37*(12), 1194–1207. https://doi.org/10.1002/da.23107

Brinsley, J., Schuch, F., Lederman, O., Girard, D., Smout, M., Immink, M. A., Stubbs, B., Firth, J., & Rosenbaum, S. (2021). Effects of yoga on depressive symptoms in people with mental disorders: a systematic review and meta-analysis. *British Journal of Sports Medicine, 55*, 992–1000. https://doi.org/10.1136/bjsports-2019-101242

Caplan, M., Portillo, A., & Seely, L. (2013). Yoga psychotherapy: the integration of western psychological theory and ancient yogic wisdom. *Journal of Transpersonal Psychology, 45*(2).

Capon, H., O'Shea, M., & McIver, S. (2019). Yoga and mental health: A synthesis of qualitative findings. *Complementary Therapies in Clinical Practice*, *37*, 122–132. https://doi.org/10.1016/j.ctcp.2019.101063

Capon, H., O'Shea, M., Evans, S., & McIver, S. (2021). Yoga complements cognitive behaviour therapy as an adjunct treatment for anxiety and depression: qualitative findings from a mixed-methods study. *Psychology and Psychotherapy: Theory, Research and Practice, 94*(4), 1015–1035. https://doi.org/10.1111/papt.12343

Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*(1), 23–33. https://doi.org/10.1007/s10865-007-9130-7

Carpenter, J. K., Andrews, L. A., Witcraft, S. M., Powers, M. B., Smits, J. A. J., & Hofmann, S. G. (2018). Cognitive behavioral therapy for anxiety and related disorders: a meta-analysis of randomized placebo-controlled trials. *Depression and Anxiety, 35*(6), 502–514. https://doi.org/10.1002/da.22728

Chong, C. S., Tsunaka, M., Tsang, H. W., Chan, E. P., & Cheung, W. M. (2011). Effects of yoga on stress management in healthy adults: a systematic review. *Alternative Therapies in Health and Medicine, 17*(1), 32–38.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155

Corscadden, L., Callander, E. J., & Topp, S. M. (2019). Who experiences unmet need for mental health services and what other barriers to accessing health care do they face? Findings from Australia and Canada. *The International Journal of Health Planning and Management, 34*(2), 761–772. https://doi.org/10.1002/hpm.2733

Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2013). Yoga for depression: a systematic review and meta-analysis. *Depression and Anxiety, 30*(11), 1068–1083. https://doi.org/10.1002/da.22166

Cramer, H., Sibbritt, D., Park, C. L., Adams, J., & Lauche, R. (2017). Is the practice of yoga or meditation associated with a healthy lifestyle? Results of a national cross-sectional survey of 28,695 Australian women. *Journal of Psychosomatic Research, 101*, 104–109. https://doi.org/10.1016/j.jpsychores.2017.07.013

Cramer, H., Lauche, R., Anheyer, D., Pilkington, K., de Manincor, M., Dobos, G., & Ward, L. (2018). Yoga for anxiety: a systematic review and meta-analysis of randomized controlled trials. *Depression and Anxiety, 35*(9), 830–843. https://doi.org/10.1002/da.22762

Cuijpers, P., Noma, H., Karyotaki, E., Cipriani, A., & Furukawa, T. A. (2019). Effectiveness and acceptability of cognitive behavior therapy delivery formats in adults with depression: a network meta-analysis. *JAMA Psychiatry, 76*(7), 700–707. https://doi.org/10.1001/jamapsychiatry.2019.0268

Danhauer, S. C., Miller, M. E., Divers, J., Anderson, A., Hargis, G., & Brenes, G. A. (2022a). A randomized preference trial comparing cognitive-behavioral therapy and yoga for the treatment of late-life worry: examination of impact on depression, generalized anxiety, fatigue, pain, social participation, and physical function. *Global Advances in Health and Medicine, 11*. https://doi.org/10.1177/2164957X221100405

Danhauer, S. C., Miller, M. E., Divers, J., Anderson, A., Hargis, G., & Brenes, G. A. (2022b). Long-term effects of cognitive-behavioral therapy and yoga for worried older adults. *The American Journal of Geriatric Psychiatry, 30*(9), 979–990. https://doi.org/10.1016/j.jagp.2022.02.002

Davies, R., & Dart, J. (2004). *The 'most significant change' MSC technique: a guide to its use*. Retrieved from the Clear Horizon website: https://www.clearhorizonacademy.com/wp-content/uploads/2020/05/MSC-user-guide-2005.pdf. Accessed June 2020; July 2022.

Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: development and application of a slope difference test. *Journal of Applied Psychology, 91*(4), 917–926. https://doi.org/10.1037/0021-9010.91.4.917

de Manincor, M., Bensoussan, A., Smith, C., Fahey, P., & Bourchier, S. (2015). Establishing key components of yoga interventions for reducing depression and anxiety, and improving wellbeing: a Delphi method study. *BMC Complementary and Alternative Medicine, 15*(1), 1–10. https://doi.org/10.1186/s12906-015-0614-7

Desikachar, T. K. V. (1999). *The heart of yoga: developing a personal practice*. Inner Traditions International.

Desikachar, K., Bragdon, L., & Bossart, C. (2005). The yoga of healing: exploring yoga's holistic model for health and well-being. *International Journal Of Yoga Therapy, 15*(1), 17–39. https://doi.org/10.17761/ijyt.15.1.p501l33535230737

Dick, A. M., Niles, B. L., Street, A. E., DiMartino, D. M., & Mitchell, K. S. (2014). Examining mechanisms of change in a yoga intervention for women: the influence of mindfulness, psychological flexibility, and emotion regulation on PTSD symptoms. *Journal of Clinical Psychology, 70*(12), 1170–1182. https://doi.org/10.1002/jclp.22104

Dugas, M. J., Ladouceur, R., Léger, E., Freeston, M. H., Langolis, F., Provencher, M. D., & Boisvert, J. M. (2003). Group cognitive-behavioral therapy for generalized anxiety disorder: treatment outcome and long-term follow-up. *Journal of Consulting and Clinical Psychology, 71*(4), 821. https://doi.org/10.1037/0022-006X.71.4.821

Dunlop, B. W., Kelley, M. E., Aponte-Rivera, V., Mletzko-Crowe, T., Kinkead, B., Ritchie, J. C., et al. (2017). Effects of patient preferences on outcomes in the predictors of remission in depression to individual and combined treatments (PReDICT) Study. *The American Journal of Psychiatry, 174*(6), 546–556. https://doi.org/10.1176/appi.ajp.2016.16050517

First, M. B., Williams, J. B., Karg, R. S., & Spitzer, R. L. (2016). *SCID-5-CV: structured clinical interview for DSM-5 disorders: clinician version*. American Psychiatric Association Publishing.

Fischer, C. T. (2009). Bracketing in qualitative research: conceptual and practical matters. *Psychotherapy Research, 19*(4-5), 583–590. https://doi.org/10.1080/10503300902798375

Francis, H. M., Stevenson, R. J., Chambers, J. R., Gupta, D., Newey, B., & Lim, C. K. (2019). A brief diet intervention can reduce symptoms of depression in young adults – a randomised controlled trial. *PloS one, 14*(10), e0222768. https://doi.org/10.1371/journal.pone.0222768

Galluci, M., (2019). *GAMLj: General analyses for linear models. [Jamovi Module]*. Retrieved from: https://gamlj.github.io/. Accessed Aug 2022.

Gibbons, R. D., Hedeker, D., & DuToit, S. (2010). Advances in analysis of longitudinal data. *Annual Review of Clinical Psychology, 6*, 79–107. https://doi.org/10.1146/annurev.clinpsy.032408.153550

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today, 24*(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery, and Psychiatry, 23*(1), 56–62. https://doi.org/10.1136/jnnp.23.1.56

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: understanding and treating human suffering*. Guilford Press.

Hewett, Z. L., Pumpa, K. L., Smith, C. A., Fahey, P. P., & Cheema, B. S. (2018). Effect of a 16-week Bikram yoga program on perceived stress, self-efficacy and health-related quality of life in stressed and sedentary adults: a randomised controlled trial. *Journal of Science and Medicine in Sport, 21*(4), 352–357. https://doi.org/10.1016/j.jsams.2017.08.006

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*(2), 427–440. https://doi.org/10.1007/s10608-012-9476-1

Kabat-Zinn, J. (1994). *Wherever you go, there you are: mindfulness meditation in everyday life*. Hyperion.

Kelly, U., Haywood, T., Segell, E., & Higgins, M. (2021). Trauma-sensitive yoga for post-traumatic stress disorder in women veterans who experienced military sexual trauma: interim results from a randomized controlled trial. *The Journal of Alternative and Complementary Medicine, 27*(S1), S45–S59. https://doi.org/10.1089/acm.2020.0417

Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: a review of empirical studies. *Clinical Psychology Review, 31*(6), 1041–1056. https://doi.org/10.1016/j.cpr.2011.04.006

Kennerley, H., Kirk, J., & Westbrook, D. (2016). *An introduction to cognitive behaviour therapy: Skills and applications*. Sage.

Khalsa, M. K., Greiner-Ferris, J. M., Hofmann, S. G., & Khalsa, S. B. S. (2015). Yoga-enhanced cognitive behavioural therapy (Y-CBT) for anxiety management: a pilot study. *Clinical Psychology and Psychotherapy, 22*(4), 364–371. https://doi.org/10.1002/cpp.1902

Kinser, P., Elswick, R., & Kornstein, S. (2014). Potential long-term effects of a mind-body intervention for women with major depressive disorder: sustained mental health improvements with a pilot yoga intervention. *Archives of Psychiatric Nursing, 28*(6), 377–383. https://doi.org/10.1016/j.apnu.2014.08.014

Kraftsow, G. (1999). *Yoga for wellness*. Penguin Books.

La Rocque, C. L., Mazurka, R., Stuckless, T. J., Pyke, K., & Harkness, K. L. (2021). Randomized controlled trial of Bikram yoga and aerobic exercise for depression in women: efficacy and stress-based mechanisms. *Journal of Affective Disorders, 280*, 457–466. https://doi.org/10.1016/j.jad.2020.10.067

Lam, S. U., Kirvin-Quamme, A., & Goldberg, S. B. (2022). Overall and differential attrition in mindfulness-based interventions: a meta-analysis. *Mindfulness, 13*, 1–15.

Lang, A. J. (2013). What mindfulness brings to psychotherapy for anxiety and depression. *Depression and Anxiety, 30*(5), 409–412. https://doi.org/10.1002/da.22081

Lincoln, Y., & Guba, E. G. (1985). Naturalistic inquiry. Newbury Park, CA: Sage

Loerinc, A. G., Meuret, A. E., Twohig, M. P., Rosenfield, D., Bluett, E. J., & Craske, M. G. (2015). Response rates for CBT for anxiety disorders: need for standardized criteria. *Clinical Psychology Review, 42*, 72–82. https://doi.org/10.1016/j.cpr.2015.08.004

Lovibond, S., & Lovibond, P. (1996). *Manual for the depression anxiety stress scales*. Psychology Foundation of Australia.

Marker, I., Salvaris, C. A., Thompson, E. M., Tolliday, T., & Norton, P. J. (2019). Client motivation and engagement in transdiagnostic group cognitive behavioral therapy for anxiety disorders: predictors and outcomes. *Cognitive Therapy and Research, 43*, 819–833. https://doi.org/10.1007/s10608-019-10014-1

McIver, S., O'Shea, M., Nixon, B., Seidler, Z., & Evans, S. (2022). "The only man on the mat": yoga as a therapeutic pathway for men's mental health. *Australian Psychologist, 57*(5), 271–279. https://doi.org/10.1080/00050067.2022.2093624

McNeish, D. M., & Harring, J. R. (2017). Clustered data with small sample sizes: comparing the performance of model-based and design-based approaches. *Communications in Statistics-Simulation and Computation, 46*(2), 855–869. https://doi.org/10.1080/03610918.2014.983648

Mocanu, E., Mohr, C., Pouyan, N., Thuillard, S., & Dan-Glauser, E. S. (2018). Reasons, years and frequency of yoga practice: effect on emotion response reactivity. *Frontiers in Human Neuroscience, 12*, 264. https://doi.org/10.3389/fnhum.2018.00264

Nathan, P., Smith, L., Rees, C., Correia, H., Juniper, U., Kingsep, P., & Lim, L. (2004). *Mood management course: a cognitive behavioural group treatment programme for anxiety disorders and depression* (2nd ed.). Centre for Clinical Interventions.

National Institute of Health and Care Excellence. (2005). *Obsessive-compulsive disorder and body dysmorphic disorder: treatment [NICE Clinical Guideline No. 31]*. Retrieved from https://www.nice.org.uk/guidance/cg31. Accessed June 2022.

National Institute of Health and Care Excellence. (2009). *Depression in adults: recognition and management [NICE Clinical Guideline No. 90]*. Retrieved from www.nice.org.uk/guidance/cg90. Accessed June 2022.

National Institute of Health and Care Excellence. (2013). *Social anxiety disorder: recognition, assessment and treatment [NICE Clinical Guideline No. 159]*. Retrieved from https://www.nice.org.uk/guidance/cg159. Accessed June 2022.

National Institute of Health and Care Excellence. (2019). *NICE pathways: Generalised anxiety disorder*. Retrieved from http://pathways.nice.org.uk/pathways/generalised-anxiety-disorder. Accessed June 2022.

Nauphal, M., Mischoulon, D., Uebelacker, L., Streeter, C., & Nyer, M. (2019). Yoga for the treatment of depression: five questions to move the evidence-base forward. *Complementary therapies in medicine, 46*, 153–157. https://doi.org/10.1016/j.ctim.2019.08.012

Newby, J. M., McKinnon, A., Kuyken, W., Gilbody, S., & Dalgleish, T. (2015). Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. *Clinical Psychology Review, 40*, 91–110. https://doi.org/10.1016/j.cpr.2015.06.002

Norton, P. J. (2022). Transdiagnostic cognitive behavioural therapy. *Clinical Psychologist, 26*(2), 105–107. https://doi.org/10.1080/13284207.2022.2064212

Norton, P. J., Provencher, M. D., Kilby, C. J., & Roberge, P. (2021). Impact of group transdiagnostic cognitive-behavior therapy for anxiety disorders on comorbid diagnoses: results from a pragmatic randomized clinical trial in primary care. *Depression and Anxiety, 38*, 749–756. https://doi.org/10.1002/da.23184

O'Shea, M., Capon, H., Skvarc, D., Evans, S., McIver, S., Harris, J., et al. (2022). A pragmatic preference trial of therapeutic yoga as an adjunct to group cognitive behaviour therapy versus group CBT alone for depression and anxiety. *Journal of Affective Disorders, 307*, 1–10. https://doi.org/10.1016/j.jad.2022.03.028

Park, C. L., Quinker, D., Dobos, G., & Cramer, H. (2019). Motivations for adopting and maintaining a yoga practice: a national cross-sectional survey. *The Journal of Alternative and Complementary Medicine, 25*(10), 1009–1014. https://doi.org/10.1089/acm.2019.0232

Pascoe, M. C., J de Manincor, M., Hallgren, M., Baldwin, P. A., Tseberja, J., & Parker, A. G. (2021). Psychobiological mechanisms underlying the mental health benefits of yoga-based interventions: a narrative review. *Mindfulness, 12*(12), 2877–2889. https://doi.org/10.1007/s12671-021-01736-z

Pearl, S. B., & Norton, P. J. (2017). Transdiagnostic versus diagnosis specific cognitive behavioural therapies for anxiety: a meta-analysis. *Journal of Anxiety Disorders, 46*, 11–24. https://doi.org/10.1016/j.janxdis.2016.07.004

Price, M., Spinazzola, J., Musicaro, R., Turner, J., Suvak, M., Emerson, D., & van der Kolk, B. (2017). Effectiveness of an extended yoga treatment for women with chronic posttraumatic stress disorder. *The Journal of Alternative and Complementary Medicine, 23*(4), 300–309. https://doi.org/10.1089/acm.2015.0266

Reinholt, N., & Krogh, J. (2014). Efficacy of transdiagnostic cognitive behaviour therapy for anxiety disorders: a systematic review and meta-analysis of published outcome studies. *Cognitive Behaviour Therapy, 43*(3), 171–118. https://doi.org/10.1080/16506073.2014.897367

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health, 23*, 334–340. https://doi.org/10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G

Santoft, F., Axelsson, E., Ost, L. G., Hedman-Lagerlof, M., Fust, J., & Hedman-Lagerlof, E. (2019). Cognitive behaviour therapy for depression in primary care: systematic review and meta-analysis. *Psychological Medicine, 49*(8), 1266–1274. https://doi.org/10.1017/S0033291718004208

Schulz, K. F., Altman, D. G., Moher, D., & CONSORT Group*. (2010). CONSORT 2010 statement: updated guidelines for reporting parallel group randomized trials. *Annals of internal medicine, 152*(11), 726–732. https://doi.org/10.7326/0003-4819-152-11-201006010-00232

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2018). *Mindfulness-based cognitive therapy for depression* (2nd ed.). The Guilford Press.

Seidler, Z. E., Rice, S. M., Kealy, D., Oliffe, J. L., & Ogrodniczuk, J. S. (2020). What gets in the way? Men's perspectives of barriers to mental health services. *International Journal of Social Psychiatry, 66*(2), 105–110. https://doi.org/10.1177/0020764019886336

Simon, N. M., Hofmann, S. G., Rosenfield, D., Hoeppner, S. S., Hoge, E. A., Bui, E., & Khalsa, S. B. S. (2021). Efficacy of yoga vs cognitive behavioral therapy vs stress education for the treatment of generalized anxiety disorder: a randomized clinical trial. *JAMA Psychiatry, 78*(1), 13–20. https://doi.org/10.1001/jamapsychiatry.2020.2496

Sipe, W. E., & Eisendrath, S. J. (2012). Mindfulness-based cognitive therapy: theory and practice. *The Canadian Journal of Psychiatry, 57*(2), 63–69. https://doi.org/10.1177/070674371205700202

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consulting and Clinical Psychology, 80*, 547–559. https://doi.org/10.1037/a0028226

Szuhany, K. L., Adhikari, S., Chen, A., Lubin, R. E., Jennings, E., Rassaby, M., Eakley, R., Brown, M. L., Suzuki, R., Barthel, A. L., Rosenfield, D., Hoeppner, S. S., Khalsa, S. B., Bui, E., Hofmann, S. G., & Simon, N. M. (2022). Impact of preference for yoga or cognitive behavioral therapy in patients with generalized anxiety disorder on treatment outcomes and engagement. *Journal of Psychiatric Research*, *153*, 109–115. https://doi.org/10.1016/j.jpsychires.2022.07.008

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson Education Limited.

Tariq, S., & Woodman, J. (2013). Using mixed methods in health research. *JRSM Short Reports, 4*(6), 2042533313479197. https://doi.org/10.1177/2042533313479197

Team, R. Core, (2020). *R: a language and environment for statistical computing*. Retrieved from: https://cran.r-project.org/. Accessed Aug 2022.

Thabane, L., Ma, J., Chu, R., Cheng, J., Ismaila, A., Rios, L. P., & Goldsmith, C. H. (2010). A tutorial on pilot studies: the what, why and how. *BMC Medical Research Methodology, 10*(1), 1. https://doi.org/10.1186/1471-2288-10-1

The Jamovi Project (2021). *Jamovi. (Version 2.2) [Computer Software]*. Retrieved from https://www.jamovi.org. Accessed Aug 2022.

Tolahunase, M. R., Gautam, S., Sagar, R., Kumar, M., & Dada, R. (2021). Yoga in major depressive disorder: molecular mechanisms and clinical utility. *Frontiers in Bioscience-Scholar, 13*(1), 56–81. https://doi.org/10.52586/S553

van Dis, E. A. M., van Veen, S. C., Hagenaars, M. A., Batelaan, N. M., Bockting, C. L. H., van den Heuvel, R. M., et al. (2020). Long-term outcomes of cognitive behavioral therapy for anxiety-related disorders: a systematic review and meta-analysis. *JAMA Psychiatry, 77*(3), 265–273. https://doi.org/10.1001/jamapsychiatry.2019.3986

Vancampfort, D., Stubbs, B., Van Damme, T., Smith, L., Hallgren, M., Schuch, F., et al. (2021). The efficacy of meditation-based mind-body interventions for mental disorders: a meta-review of 17 meta-analyses of randomized controlled trials. *Journal of Psychiatric Research, 134*, 181–191. https://doi.org/10.1016/j.jpsychires.2020.12.048

Vears, D. F., & Gillam, L. (2022). Inductive content analysis: a guide for beginning qualitative researchers. *Focus on Health Professional Education: A Multi-disciplinary Journal, 23*(1), 111–127.

Vorkapic, C. F., & Range, B. (2014). Reducing the symptomatology of panic disorder: the effects of a yoga program alone and in combination with cognitive-behavioral therapy. *Frontiers in Psychiatry, 5*, 177. https://doi.org/10.3389/fpsyt.2014.00

Ware, C. J. (2007). Yoga and psychotherapy. *Yoga Therapy in Practice, 3*(2), 15–17.

Wasti, S. P., Simkhada, P., van Teijlingen, E. R., Sathian, B., & Banerjee, I. (2022). The growing importance of mixed-methods research in health. *Nepal Journal of Epidemiology, 12*(1), 1175. https://doi.org/10.3126/nje.v12i1.43633

West, J. L., Tremont, G., Miller, I. W., & Uebelacker, L. A. (2021). Yoga v health education for attentional processes relevant to major depressive disorder. *Mindfulness, 12*(3), 604–612. https://doi.org/10.1007/s12671-020-01519-y

Whiteford, H. A., Harris, M. G., Burgess, P. M., Buckingham, W. J., Pirkis, J. E., Barendregt, J. J., & Hall, W. D. (2014). Estimating treatment rates for mental disorders in Australia. *Australian Health Review, 38*(1), 80–85. https://doi.org/10.1071/AH13142

Windle, E., Tee, H., Sabitova, A., Jovanovic, N., Priebe, S., & Carr, C. (2020). Association of patient treatment preference with dropout and clinical outcomes in adult psychosocial mental health interventions a systematic review and meta-analysis. *JAMA. Psychiatry, 77*(3), 294–302. https://doi.org/10.1001/jamapsychiatry.2019.3750

World Health Organisation. (2017). *Depression and other common mental disorders: global health estimates*. World Health Organization.

Young, A. S., Klap, R., Sherbourne, C. D., & Wells, K. B. (2001). The quality of care for depressive and anxiety disorders in the United States. *Archives of General Psychiatry, 58*(1), 55–61. https://doi.org/10.1001/archpsyc.58.1.55

Zhang, Z., & Yuan, K. H. (2018). *Practical statistical power analysis using webpower and R*. ISDSA Press.

Zoogman, S., Goldberg, S. B., Vousoura, E., Diamond, M. C., & Miller, L. (2019). Effect of yoga-based interventions for anxiety symptoms: a meta-analysis of randomized controlled trials. *Spirituality in Clinical Practice, 6*(4), 256–278. https://doi.org/10.1037/scp0000202