The feasibility and preliminary effectiveness of group-based Compassionate Mind Training for adults experiencing the menopause transition and early postmenopause

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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Overview

This doctoral thesis is the product of a joint project with fellow trainee clinical psychologist, Kate Robinson. It explores the psychological wellbeing of women experiencing the menopause transition and early postmenopause and is comprised of three parts.

Part one is a systematic review and meta-analysis examining the effectiveness of physical activity interventions for non-physiological symptoms of the menopause, including depression, anxiety, mood, cognition, stress and quality of life. The review synthesises findings from 11 randomised controlled trials, and subgroup analyses explore the influence of intervention type and menopausal stage. Four studies are narratively synthesised.

Part two presents a feasibility study evaluating an online group-based Compassionate Mind Training intervention for peri and early postmenopausal women. The study reports on feasibility and acceptability outcomes, including recruitment, retention, attendance and outcome measure completion. Preliminary trends for potential improvements in key menopause and compassion outcomes are also reported. The findings warrant further investigation in larger, fully powered trials.

Part three offers a critical appraisal of the research process. It includes a reflection on the rationale for investigating physical activity and compassion-based approaches in addition to a discussion on heterogeneity in intervention research and its implications. Space is also given for personal and professional reflections in response to dilemmas that arose in the empirical work.

Impact Statement

This thesis addresses the psychological wellbeing of women during perimenopause and early postmenopausal, which is shaped by several biopsychosocial changes during this time. In recent years, menopause has received increased public attention, with campaigns led by public figures such as Davina McCall, calling for better education and workplace support, and even for menopause to be recognised as a protective characteristic under the Equality Act 2010. Despite this, psychological support remains limited. Expanding the evidence base for accessible and appropriate interventions is essential, particularly as services struggle to meet the evolving needs of midlife women.

The systematic review and meta-analysis contribute to the literature on lifestyle interventions, by synthesising evidence on physical activity as a scalable intervention for psychological and quality of life outcomes associated with menopause. By applying more stringent inclusion criteria, this review addresses inconsistencies in previous research and enhances conceptual clarity. The findings support the inclusion of physical activity within a holistic model of menopause care and highlight key priorities for future research and methodological improvement. These insights can help inform public health initiatives to promote lifestyle-based interventions.

The empirical study makes a novel contribution by evaluating the feasibility and acceptability of a six-session, online, group-based Compassionate Mind Training (CMT) intervention for peri and early postmenopausal women. The findings demonstrated strong engagement, high retention and promising preliminary trends for depression, somatic symptoms, self-criticism and self-compassion. As a feasibility study, the research offers valuable insight into real world delivery and applicability of the intervention. The brief, manualised format of the CMT intervention, combined with the accessibility of online delivery, offers potential for its integration into low-intensity mental health services, such as NHS Talking Therapies.

This thesis also promotes a shift in how support for menopause can be conceptualised, moving away from narrow hormonal or medical framings, towards

non-pathologising, person-centred and compassionate approaches to care. This aligns with the Women's Health Strategy (Department of Health and Social Care, 2022) which identifies critical gaps in menopause care and calls for the improvement of non-hormonal options. This thesis contributes to the development of a more psychologically informed, inclusive and accessible model of menopause care.

The findings will be disseminated through peer-reviewed publications and editorials.

References

Department of Health and Social Care. (2022, August 30). *Women's health strategy for England* (Section 13: Menopause). GOV.UK. https://www.gov.uk/government/publications/womens-health-strategy-for-england/womens-health-strategy-for-england#menopause

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Part 1 – Literature Review

The effectiveness of physical activity interventions on non-physiological symptoms of menopause: A systematic review and meta-analysis

Abstract

Background: Menopause is associated with low mood, anxiety, cognitive difficulties, stress and reduced quality of life (QoL). Physical activity (PA) offers a promising non-pharmacological approach for alleviating these symptoms. This systematic review and meta-analysis examined the effectiveness of PA for non-physiological symptoms of menopause.

Method: Five databases were searched from inception to March 2025 for randomised controlled trials (RCTs). Effect sizes were calculated using a random effects model with post-test means and standard deviations. Subgroup analyses were carried out by menopausal stage (perimenopause and early postmenopause) and intervention type (aerobic-based interventions (ABI) and mind-body interventions (MBI)). Pre-post sensitivity analyses were also conducted.

Results: 12 RCTs were identified (n=1,003), of which 11 were meta-analysed. PA significantly improved depression (g=-1.37, 95% CI [-1.96, -0.79], mood (g= 0.84, 95% CI [0.40, 1.29]), psychological QoL (g=0.66, 95% CI [0.19, 1.13]) and overall QoL (g=1.10, 95% CI [0.32, 1.88]). Significant effects for early postmenopause were found across these outcomes, with improvements for depressive symptoms also found for perimenopause (g=-1.57, 95% [CI -2.58, -0.56]). ABIs significantly improved depression (g=-1.07, 95% CI [-1.35, -0.78]), mood (g=1.05, 95% CI[0.52, 1.58]), and overall QoL (g=1.41, 95% CI [0.12, 2.69]), whilst MBIs significantly improved psychological QoL (g=0.80, 95% CI [0.43, 1.16]). Sensitivity analyses largely supported these findings.

Conclusions: PA is an effective intervention for improving non-physiological symptoms in menopausal women.

Introduction

Menopause is a biological process that many women go through. It typically occurs around the age of 50 (Sherman, 2005) but can also begin earlier due to medical treatments such as chemotherapy or surgery. Additionally, 10% of women under 45 years old start menopause prematurely (Boekhout et al., 2006; Talaulikar, 2022). Menopause is defined by the cessation of menstruation for 12 consecutive months, marking the end of ovarian follicular activity, and so, reproductive capability months (Harlow & Paramsothy, 2011; Sherman, 2005).

The Stages of Reproductive Aging Workshop (STRAW+10) framework provides 'gold standard' criterion to define menopause stages (Harlow et al., 2012). It includes early and late perimenopause, known as the menopause transition (MT), marked by hormonal fluctuations, and early postmenopause, during which hormone levels stabilise but remain low (Harlow et al., 2012). Women in the MT and early postmenopause commonly report symptoms that affect both physical and psychological wellbeing, including hot flushes and night sweats (or vasomotor symptoms), mood changes, sleep disturbances, cognitive impairments, low libido, urogenital difficulties, and weight changes (Monteleone et al., 2018; Rodríguez-Landa et al., 2015; Talaulikar, 2022). Symptoms such as anxiety and mood instability are thought to increase in frequency and intensity during the late MT stage and persist into early postmenopause (Santoro, 2016).

Peri and early postmenopause are shaped by an interplay of hormonal and biological changes, psychosocial stressors, and cultural factors (Hunter & Rendall, 2007). During these phases, women may simultaneously navigate other life transitions, such as shifts in caregiving responsibilities, changes in occupational demands, and health problems (de Salis et al., 2017; Kandola et al., 2019; Thurston et al., 2018). As a result, this represents a time of increased vulnerability to mental health difficulties (Sassarini, 2016), with more than half of women in the UK experiencing the MT reporting mental health concerns (Bazeley et al., 2022). Correlations have been found between the MT and increased risk of depression, anxiety, and cognitive complaints, all of which can significantly lower quality of life (QoL) (Badawy et al., 2024; Bromberger et al., 2001; Nosek et al., 2012). These

symptoms are considered non-physiological in nature as they are distinct from physical symptoms and can be understood through a biopsychosocial-cultural lens (Hunter & Rendall, 2007; Spector et al., 2024), rather than solely influenced by hormonal changes. Studies have consistently shown that peri and postmenopausal women are at a greater risk of experiencing psychological distress and cognitive difficulties (such as trouble concentrating and difficulties with memory) , compared to those who are premenopausal (Alblooshi et al., 2023; Hantsoo & Epperson, 2017; Natari et al., 2018; Reuben et al., 2021). Therefore, establishing interventions that can prevent psychological decline during this period of life should be a key public health priority.

Hormone replacement therapy (HRT) is the first line treatment for vasomotor and other physiological symptoms of menopause and can also help with some psychological symptoms (Brown et al., 2024). However, it is not suitable for all, such as those with certain cancers (National Institute of Clinical Excellence, 2015), and is avoided by others, due to the perceived risks, such as the increased risk of some cancers, and strokes (Posadzki et al., 2013; Rossouw et al., 2002). Psychological interventions, such as Cognitive Behavioural Therapy (CBT) are effective alternatives, improving low mood, anxiety, cognition and QoL for these women (Spector et al., 2024; Ye et al., 2022). Though access to such therapies is challenging due to resource constraints and long wait times. With an estimated 7 million women in the UK aged 45 to 65 (Office for National Statistics (ONS), 2024), many of whom will likely be going through the MT or early postmenopause, there is a pressing need for scalable, accessible interventions to support mental health and wellbeing.

Physical activity (PA) may be one such approach. It has been described as a “miracle cure” (Academy of Medical Royal Colleges, 2015) for improving health and overall wellbeing (Ekelund et al., 2019). Defined as any bodily movement that increases energy expenditure (World Health Organisation, 2024), PA is thought to be an effective complementary or alternative treatment to pharmacological and psychotherapeutic interventions for improving mental health outcomes (Noetel et al., 2024). It is a safe, cost-effective and accessible intervention, including for those with severe mental illnesses (Kandola & Osborn, 2021), making it a viable option for

diverse populations (Roux et al., 2008). There is evidence for PA reducing depression, anxiety, and cognitive decline by 20–30% (Pearce et al., 2022; Haseler et al., 2019). Meta-analyses further demonstrate PA to improve psychological wellbeing (Nguyen et al., 2020) by lowering rates of cognitive decline (Anderson et al., 2014) and reducing psychological symptoms (Fadlilah & Akriana, 2023; Park et al., 2023; Singh et al., 2023; Yue et al., 2025).

There is a growing interest in the role of PA for alleviating non-physiological symptoms of the menopause. However, many randomised controlled trials (RCTs) have predominantly focused on postmenopausal populations or used broad inclusion criteria, making it difficult to draw conclusions about women in peri or early postmenopause. For example, the review by Yue et al. (2025) included women aged 40 to 75 years and menopause stages were not clearly defined. Given that menopausal symptoms persist on average for 4 to 5 years after the final menstrual period (Avis et al., 2015), studies including older age participants may not adequately capture the symptom burden associated with the MT and early postmenopause experience. Furthermore, NHS services have typically classified older adults as those aged 65 and above (ONS, 2012). This highlights a need for a focused synthesis of evidence examining the impact of PA interventions specifically amongst menopausal women aged 40 to 65 years.

Previous reviews investigating PA for psychological symptoms during menopause have also included diverse comparators such as CBT, education or medication (Yue et al., 2025; Han et al., 2024). Whilst informative, this introduces heterogeneity due to differing intervention mechanisms. Furthermore, focus has primarily been on depression and anxiety, overlooking outcomes such as cognitive difficulties and stress, which are also common and distressing during peri and early postmenopause (Kuck & Hogervosrst, 2024; Metcalf et al., 2024) . A more targeted synthesis is needed to clarify the potential role of PA for addressing non-physiological symptoms of menopause.

The aim of the current review is to assess the effectiveness of PA for improving non-physiological symptoms (depression, anxiety, overall mood, cognition, stress, and quality of life) in women aged 40 to 65 years who are in the MT or early

postmenopause. The key research question is: 'Are PA interventions effective for improving non-physiological symptoms and quality of life in peri and early postmenopausal women?'

Methods

The review was registered on the international prospective register of systematic reviews (PROSPERO) in November 2024 (ID: CRD42024531437). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) were rigorously adhered to. Population, interventions, comparators, outcomes, study design (PICOS) criteria were formulated a priori to guide the scope of the review, the searching selection, and synthesis of the literature.

Eligibility criteria

Studies were eligible for inclusion if they 1) were RCTs; 2) recruited women in perimenopause or early postmenopause, using defined staging criteria for early postmenopause; 3) included naturally occurring menopause only; 4) included participants aged 40-65 years; 5) provided clearly reported parameters of the intervention (e.g. duration, frequency, modality); 6) reported at least one outcome related to depression, anxiety, mood, QoL, cognition or stress, using a validated outcome measure.

Studies were excluded if: 1) participants were premenopausal; 2) they reported participants being >5years postmenopausal; 3) participants had a chronic physical health problem; 4) they included whole-body vibration; 5) they included education components (e.g. workshops or lectures); 6) they included a comparator that was not a physical activity intervention or 'treatment as usual' (TAU)/usual care; 7) they targeted psychological challenges associated with chronic physical illnesses e.g. cancer or diabetes.

Search strategy

A simultaneous search for relevant articles published from database inception up to March 2025 was conducted across five electronic databases: Medline, PsycINFO, Web of Science, Cochrane Library and Cumulative Index of Nursing and Allied Health Literature (CINAHL). Grey literatures were also searched to gain a comprehensive selection of articles relevant to the review topic. The full search strategy is provided in Appendix A (Table A1).

To determine eligibility of the studies to be included, one reviewer (SS) performed initial title and abstract screenings on Rayyan (https://rayyan.ai/) after removing duplicates, and a 2nd reviewer (KR) reviewed 10% of the results. This was followed by full text screenings by one reviewer (SS), of which a further 10% were independently checked by a 2nd reviewer (KR). Any disagreements were helped to be resolved by a 3rd reviewer (AS). Where it was not possible to access a full text copy of a paper, authors were contacted to acquire the article.

Although two studies did not fully align with the criteria, they were retained following careful consideration by two authors (SS and KR). Lee et al (2021) recruited obese postmenopausal women, treating obesity as a risk factor for chronic disease, rather than as a diagnosed condition. Similarly, Taylor et al. (2018) recruited obese, metabolically unhealthy postmenopausal women who were at an increased risk of chronic physical health problems, rather than those who had a diagnosed chronic physical health condition. Given this, and that they both satisfied all other inclusion criteria, they were included in the review.

Data extraction

One author (SS) extracted the study and intervention characteristics of the identified eligible studies, in addition to outcome data, to a Microsoft Excel data sheet. Where possible, mean scores and standard deviations (SD) for intervention and control groups in each study were extracted at baseline and post-intervention timepoints. Median and interquartile range were extracted if these were the outcome data provided. 10% of the extracted data was reviewed by an additional author (LH) for accuracy. Any disparities found in the extracted data by the two authors were

discussed with a 3rd author (AS) to reach a consensus. Where there was missing data or it was not in a suitable form for meta-analysis, study authors were contacted to obtain the raw data. For studies that did not report post-intervention sample sizes, and authors did not provide clarification after being contacted, pre-intervention sample sizes were used.

Risk of bias assessment

The Cochrane Risk of Bias 2 (RoB 2) tool (Sterne et al., 2019) was used to assess the methodological quality for the selected RCTs. It assessed bias across five domains: 1) the randomisation process, 2) deviations from intended interventions, 3) missing outcome data, 4) measurement of the outcome, and 5) selection of the reported result. Studies were assessed as 'low risk', 'some concerns' or 'high risk'. One author (SS) conducted all assessments, and 50% of papers were reviewed by a 2nd author (LH). Discrepancies were resolved through consultation with a 3rd author (AS) where necessary. Potential publication bias was assessed using funnel plots and the Egger's test (Egger et al., 1997).

Data analysis and synthesis

The meta-analysis was conducted by one author (RH) in Stata/MP version 17, using the 'meta' command. Standardised mean differences (Hedges' *g*) were calculated using post-intervention means and SD, as this was most consistently reported across studies. Effect sizes were pooled using a random-effects model with inverse variance weighting. Heterogeneity was assessed using the Q and I^2 statistics, and interpreted as follows: 0%= no heterogeneity, 0–30%= low, 40–60%= moderate, and 75–100%= substantial heterogeneity (Higgins et al., 2022).

Where studies reported both total and subscale scores for QoL, these outcomes were included in separate models. Specifically, a distinct outcome category for psychological QoL was created to account for variation in outcome reporting. Some studies provided only subscale scores, whilst others reported total scores, and some included both. As QoL measures typically encompass both physical and psychological domains, and this review focuses on non-physiological

outcomes, isolating psychological QoL allowed for a more accurate and conceptually consistent synthesis aligned with the review aims.

Subgroup analyses were carried out to explore differences in effects by menopausal stage and intervention type. For intervention type, studies were subcategorised by one author (SS) into aerobic-based interventions (ABI) and mind-body based interventions (MBI) and confirmed by a 2nd author (KR). Subcategories were informed by existing literature (Wells et al., 2012; Hoffman & Gabel, 2015; Fibbins et al., 2020). ABIs were defined as PA that intended to elevate heart rate and that may subsequently improve cardiovascular endurance. MBIs were defined as PA that integrated breath control, mindfulness, body awareness or meditative components. In three arm trials where two PA interventions of the same type were compared against a control, the intervention groups were combined for the overall analysis. The pooled means and SD were calculated following Cochrane guidelines with weighting based on sample size (Higgins et al., 2024). Intervention arms were disaggregated if they were each a different type of PA intervention.

There was more data available to calculate the total number of intervention sessions rather than total hours, for intervention dose. Therefore, the total number of sessions per intervention provided a standardised metric to estimate the average dose. Studies that did not report sufficient detail to determine total session count were excluded from the calculations.

To assess the robustness of findings, a sensitivity analysis was conducted using pre–post change scores, with effect sizes calculated as recommended by Morris (2008). A conservative pre–post correlation of 0.7 was imputed, in line with prior meta-analytic practice (Spector et al., 2024), as this value was not reported in most studies.

Narrative synthesis was used for studies that did not report sufficient data for meta-analysis or where pooling was deemed inappropriate. Reasons for exclusion were that means and SDs were not reported (Jorge et al., 2016; Lee et al., 2021) or that there were limited studies reporting a particular outcome to reliably pool effect

sizes (Ben Waer et al., 2024a; Ben Waer et al., 2024b; Joshi et al., 2011; Lahiani et al., 2023). Narrative synthesis was done according to non-physiological outcomes.

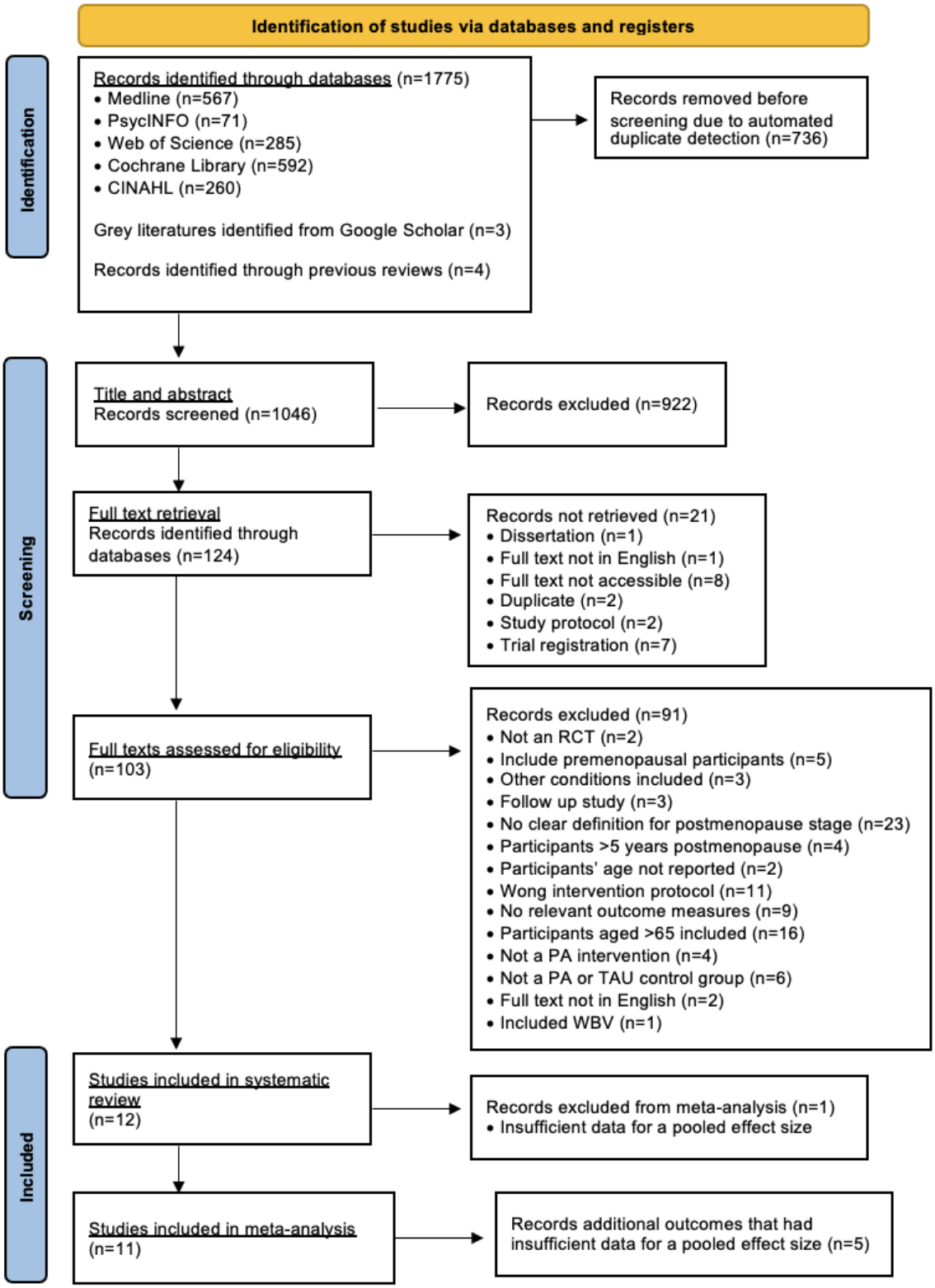
Results

Data extraction

The PRISMA flow chart depicts the study screening process (Figure 1). The search strategy resulted in 1782 records, of which 736 duplicates were removed and 922 articles excluded after reviewing the titles and abstracts. 103 full text papers were screened, of which 87 papers were excluded as they did not meet the inclusion criteria. 12 studies were therefore included in this review. 11 studies had appropriate outcome data for meta-analysis, of which five were also narratively synthesised alongside one further study that was excluded from the meta-analysis.

Figure 1

PRISMA diagram displaying the process of study selection.



Study characteristics

Studies were published between 2011 and 2024 and conducted in Brazil (n=1), China (n=3), Tunisia (n=3), India, (n=2), Iran (n=1), Korea (n=1) and USA (n=1). The timepoint for immediate post-intervention tests ranged from 6 weeks to 6 months. All studies used self-report outcome measures for depression (n=6), anxiety (n=1), mood (n=3), psychological QoL (n=6), overall QoL (n=4), cognition (n=1) and stress (n=1). Most studies (nine out of 12) included two trial arms, of which eight included a non-active control and one study included an active control. Three studies had three trial arms. Full study characteristics are presented in Table 1.

Participant characteristics

Participants were 1,003 women experiencing perimenopause (n=227) or postmenopause (n=596) naturally. There was one study that included peri and postmenopause participants (n=180), but it did not report the sample size per menopause stage. Participants were aged 40 to 65 and samples sizes ranged from 38 to 180. Half of the studies excluded participants using HRT whilst the other half did not specify the use of HRT as an inclusion or exclusion criteria. Therefore, these five studies likely included participants receiving HRT but data on the proportion of participants were not reported. Only four studies reported demographic information beyond age, and the type of data provided, varied. For education level, one study reported primary school as the highest level of academic attained by the majority of participants, whilst two reported high school, and one reported up to college. Marriage was reported as the most common marital status by three studies, whereas being not married, which included being single or widowed, was the most reported status in one study. Three studies reported on employment status, with unemployment, which included being a homemaker, was the most common. One study included information on nationality, of which most participants were Han Chinese.

Intervention characteristics

Studies varied in the PA intervention they delivered. In two arm trials, walking and Zumba were each included as the intervention in two studies, respectively.

Dancing, yoga, taekwondo, tai chi and aerobic exercise were each included as the intervention in one study each. For three arm trials, one included Pilates and Zumba, one included yoga and stretching, and one included two aerobic interventions. In total, there were 12 PA interventions across the studies. Nine interventions were subcategorised as ABIs and four were subcategorised as MBIs. This included a three arm trial with both an ABI and an MBI, so these were subcategorised separately.

Amongst the seven ABIs for which total sessions could be calculated, doses ranged from 24 to 80 sessions (M=48.3 sessions). For four MBIs, doses ranged from 20 to 90 sessions (M=52.5 sessions). Sessions per week were reported for 12 interventions. One intervention required daily practice, one required at least five sessions per week, two required five sessions per week, six required three sessions per week, and one required two sessions per week. Across all the interventions included, 12 were fully supervised, two were self-directed, and one included a combination of self-directed activity and supervised sessions. A form of adherence monitoring was included in two of the studies involving self-directed activity, such as practice diaries or exercise logs. However, no study provided an objective or consistent measure of adherence thus there is no data on actual levels of participant engagement and adherence.

Table 1

Summary of study characteristics

Author, date, country	Menopausal stage & defined criteria	Participant age range or M(SD)	Trial arms (n)	Primary intervention(s)	Intervention dose & total duration	Intervention type	Control	Outcome measures	Post intervention timepoint	Sample size (total n & group n, per inclusion in analysis)
Abedi et al., 2014, Iran*	Postmenopause: >1yr since last menstrual period	Walking: 52.4±3.8 Control: 53±4.1	2	**Walking:** Increase steps by a minimum of 500 each week	Self-directed walking for 12 weeks	ABI	TAU/usual care	Depression: BDI	12 weeks	Total:97 Walking: 48 Control: 49
Ben Waer et al, 2024a, Tunisia	Postmenopause: >4yrs since last menstrual period	50-60	2	**Zumba:** initial familiarisation session, exercises delivered with progressive difficulty starting with a warm up (50 to 60% HRmax), followed by main exercises (60 to 75% HRmax and ending with a cool down 40% of HRmax).	3 weekly instructed sessions, 1h, for 12 weeks ***Total: 36 sessions***	ABI	TAU/usual care	Cognition (working memory): Corsi Block-Tapping Task	12 weeks	Total: 38 Zumba: 19 Control: 19
Ben Waer et al, 2024b, Tunisia*	Postmenopause: <5yrs since last menstrual period	55-60	3	**Pilates:** initial familiarisation session, exercises delivered with progressive difficulty, week 1: exercise execution and breathing, weeks 2-5: floor/mat exercises, weeks 6-12: resistance exercises with instruments **Zumba:** initial familiarisation session, exercises delivered with progressive difficulty starting with a warm up (50 to 60% HRmax), followed by main exercises (60 to 75% HRmax and ending with a cool down 40% HRmax).	3 weekly instructed sessions, 1h, for 12 weeks ***Total: 36 sessions***	MBI ABI	TAU/usual care	Mood: BMIS Psychological QoL: SF-36 (Mental Health) QOL: SF-36 (Total)	12 weeks	Total: 48 Pilates: 16 Zumba: 16 Control: 16
Gao et al, 2016, China*	Perimenopause	52.5±4.3	2	**Square dancing:** 5min breaks every 30mins	Guided dancing, 60-90mins, >5 times per week	ABI	TAU/usual care	Depression: SDS	3 months	Total: 50 Square dancing: 26 Control: 24

Author, date, country	Menopausal stage & defined criteria	Participant age range or M(SD)	Trial arms (n)	Primary intervention(s)	Intervention dose & total duration		Control	Outcome measures	Post intervention timepoint	Sample size (total n & group n, per inclusion in analysis)
Jorge et al., 2016, Brazil*	Postmenopause: >1yr since last menstrual period	Yoga: 54±6 Exercise: 56±5 Control: 55±4	3	**Yoga:** Comprised of yogasanas (postures), Pranayama breathing, relaxation and meditation **Stretching:** Stretching shoulder, cervical and leg muscles	2 weekly supervised sessions, 75mins, for 12 weeks ***Total: 24 sessions***	MBI MBI	TAU/usual care	Psychological QoL: MRS (Psychological) QoL: WHOQOL-BREF Depression: BDI Stress: LSSI Anxiety: State/Trait Anxiety Inventories	12 weeks	Total: 88 Yoga: 40 Exercise: 29 Control: 19
Joshi et al., 2011, India*	Peri and postmenopause: irregular cycles; <5yrs since last menstrual period	40-54	2	**Yoga:** Comprised of yogasanas (postures), Pranayama breathing and meditation	Daily supervised sessions, 1h, for 90 days ***Total: 90 sessions***	MBI	TAU/usual care	Psychological QoL: MRS (Psychological)	90 days	Total: 180 Yoga: 90 Control: 90
Lahiani et al., 2023, Tunisia*	Postmenopause: <5yrs since last menstrual period	Zumba: 56.2±3.8‡ Control: 55.9±4.2‡	2	**Zumba:** Exercises delivered with progressive difficulty starting with a warm up (50 to 60% HRmax), followed by main exercises (60 to 75% HRmax and ending with a cool down 40% HRmax).	3 weekly supervised sessions, 50mins, for 12 weeks ***Total: 36 sessions***	ABI	TAU/usual care	Mood: BMIS Psychological QoL: SF-36 (Mental Health) QoL: SF-36 (Total)	12 weeks	Total: 38 Zumba: 19 Control: 19
Lee et al., 2021, Korea*	Postmenopause: >1yr since last menstrual period	Taekwondo: 56.0±2.9 Control: 57.5±2.9	2	**Taekwondo:** Comprised of Poomsae, kicking and stepping exercises and Taekwon aerobics, at 50-80% HRmax	5 weekly instructed sessions, 1h, for 16 weeks ***Total: 80 sessions***	ABI	TAU/usual care	Mood: PANAS-NA QoL: SWLS	16 weeks	Total: 24 Taekwondo: 12 Control: 12
Liu et al., 2024, China*	Perimenopause	Tai chi: 47.2±1.2 Control: 47.8±2.5	2	**Tai chi:** 24 styles of exercises; weeks 1-4: training phase, weeks 5-12: intervention phase	5 weekly supervised sessions, 80mins, for 12 weeks ***Total: 60 sessions***	MBI	TAU/usual care	Depression: SDS	12 weeks	Total: 66 Tai chi: 32 Control: 34

Author, date, country	Menopausal stage & defined criteria	Participant age range or M(SD)	Trial arms (n)	Primary intervention(s)	Intervention dose & total duration		Control	Outcome measures	Post intervention timepoint	Sample size (total n & group n, per inclusion in analysis)
Sharma et al., 2023, India*	Postmenopause: >2yrs since last menstrual period	45-60	2	**Aerobic exercise:** Walking on a treadmill, increasing from 50% to 55% to 60% HRmax over 2 week intervals	3 weekly supervised sessions, 30mins, for 6 weeks ***Total: 24 sessions***	ABI	Walking	Psychological QoL: SF-36 (Mental Health) Depression: BDI	6 weeks	Total: 50 Aerobic: 25 Control: 25
Taylor et al., 2018, USA*	Postmenopause: >1yr since last menstrual period	45-65	3	**Supervised facility-based exercise (SFBE):** 150min/wk moderate intensity exercise using treadmills and exercise bikes **Home-based exercise (HBE):** Work towards 10,000 steps, starting with 5,000 steps a day in week 1 then adding 500 more steps until 10,000 was reached	SFBE: 3 weekly supervised sessions for 75-150mins ***Total: 78 sessions*** HBE: 5,000-10,000 steps	ABI	TAU/usual care	Psychological QoL: SF-36 (Mental Health)	6 months	Total: 213 SFBE: 73 HBE: 69 Control: 71
Zhang et al., 2014, China*	Perimenopause	Walking: 47.8±4.6 Control: 48.6±5.2	2	**Walking:** Walking with strides alone and in a group; a stride was considered 60-70m long	3 sessions per week, 30 mins, for 12 weeks + weekly group session ***Total: 48 sessions***	ABI	TAU/usual care	Depression: Kupperman Index Score (Depression & suspicion)	12 weeks	Total: 111 Walking: 54 Control: 57

Notes: Where possible, age ranges have been reported for the total sample in each study, otherwise by group and using means and standard deviations. Additional outcome measures used by the included studies that are not relevant to the review have not been reported in the table.
BDI= Beck's Depression Inventory, BMIS=Brief Mood Introspection Scale, LSSI= Lipp Stress Symptom Inventory, MRS=Menopause Representations Scale, PANAS-NA=Positive & Negative Affect Schedule-Negative Affect, SDS=Self-Rating Depression Scale, SF-36=36-Item Short Form Survey, SWLS=Satisfaction with Life Scale, WHOQOL-BREF= World Health Organization Quality-of-Life Scale
*=Included in meta-analysis
✢=Standard error reported instead of standard deviation

Risk of bias

16.7% (n=2) of studies were judged to have 'some concerns' and 83.3% (n=10) were classified as having 'high' risks of bias. High risk of bias in studies was largely due to unblinding or single blinding, missing data and per-protocol analyses, and the use of self-report outcome measures. A summary of risk of bias judgements per bias domain can be found in Figures 2 and 3.

Following inspection of funnel plots (see Appendix A1-A4) and the Egger's test, some asymmetry was evident for depression (z=-1.88, p=.06) and clear asymmetry was evident for overall QoL (z=-1.94, p=.05). This indicates possible publication bias. In contrast, the funnel plot for psychological QoL appeared symmetrical and the Egger's test did not provide significant evidence of publication bias (z=1.31, p=.19). Due to the inclusion of two studies for mood outcomes, no Egger's test was conducted. The funnel plot shows symmetry however no reliable conclusions can be drawn about small-study effects or publication bias.

Figure 2

Summary of each bias domain of Cochrane Risk of Bias 2 Tool (Sterne et al., 2019) per study

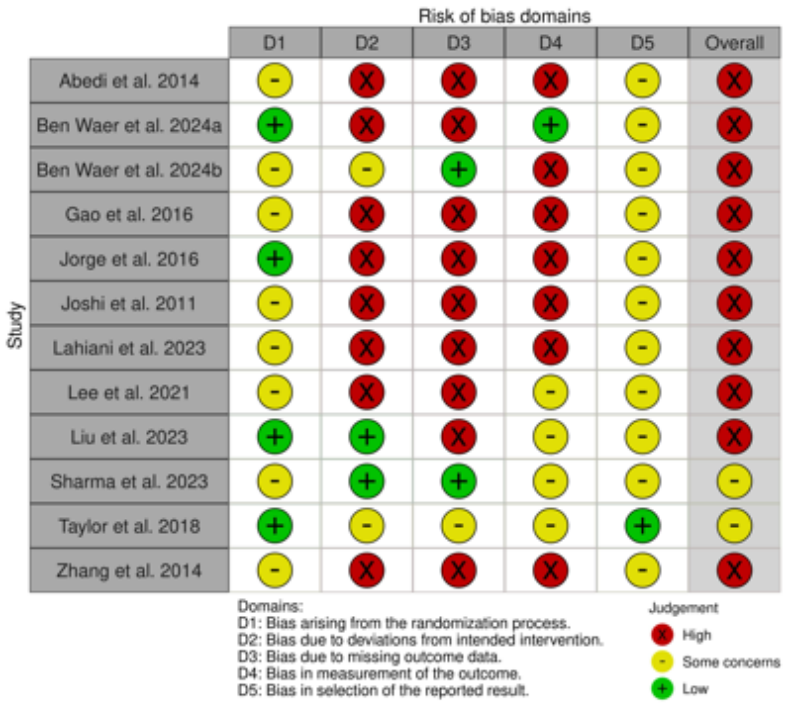
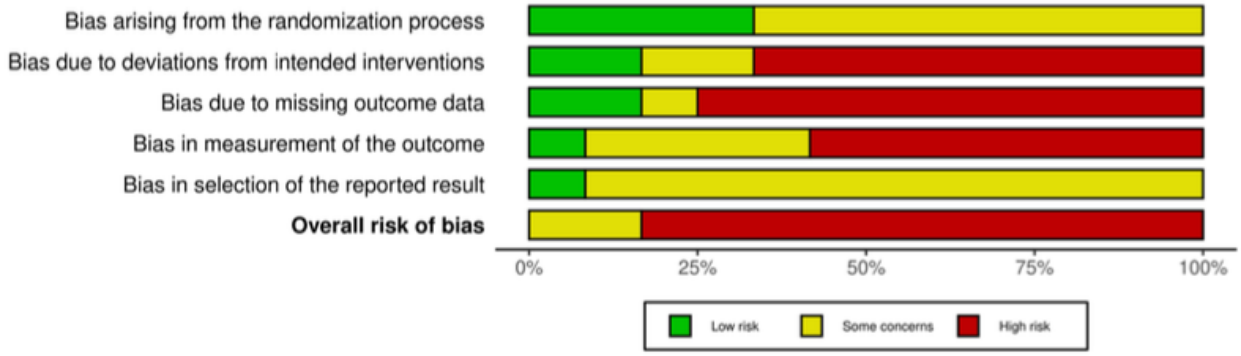


Figure 3

Weighted bar plots of the distribution of risk of bias judgments within each bias domain of Risk of Bias 2 Tool (Sterne et al., 2019)



Meta-analytic findings

Meta-analysis was performed for depression, mood, psychological QoL and overall QoL outcomes.

i. Depression

Meta-analysis of five studies (n=374) (Figure 4) showed a significant large effect of PA on improving depressive symptoms compared to control (g=-1.37, 95% CI [-1.96, -0.79]) with high heterogeneity (I^2=84.37%).

Subgroup analysis by menopause stage (Figure 5) revealed a large, significant effect for reducing depressive symptoms following PA interventions, compared to control, for perimenopausal participants (g=-1.57, 95% [CI -2.58, -0.56]), and for postmenopausal women (g=-1.14, 95% CI [-1.48, -0.79]). Subgroup differences between peri and postmenopausal women were not statistically significant. Heterogeneity was very high (I^2=90.46%) across the three studies including only perimenopausal participants, whilst there was no heterogeneity across the two studies including postmenopausal participants. For intervention type (Figure 6), ABIs produced a large, significant reduction in depressive symptoms compared to control, (g=-1.07, 95% CI [-1.35, -0.78]), with low heterogeneity (I^2=27.47%). Only one study included an MBI, therefore no subgroup analysis was conducted for this intervention type.

Figure 4

Forest plot of meta-analytic depression outcomes

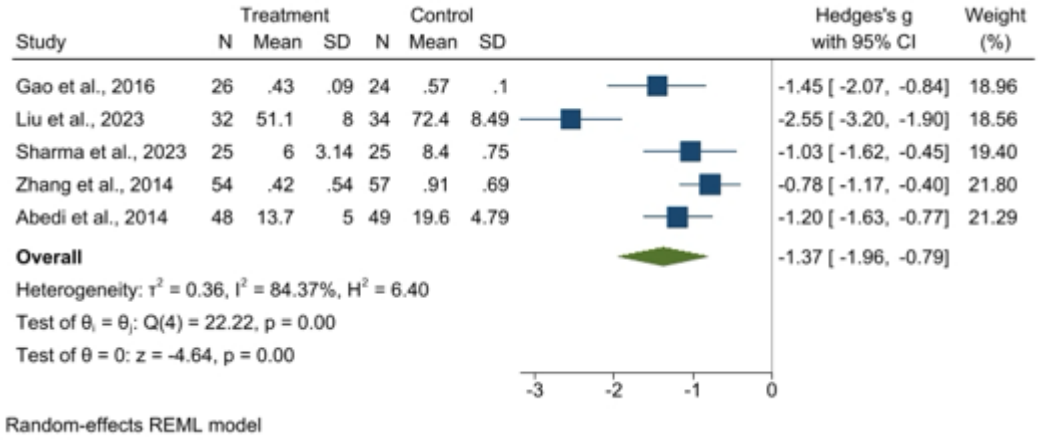


Figure 5

Forest plot of subgroup analysis by menopause stage for depression outcomes

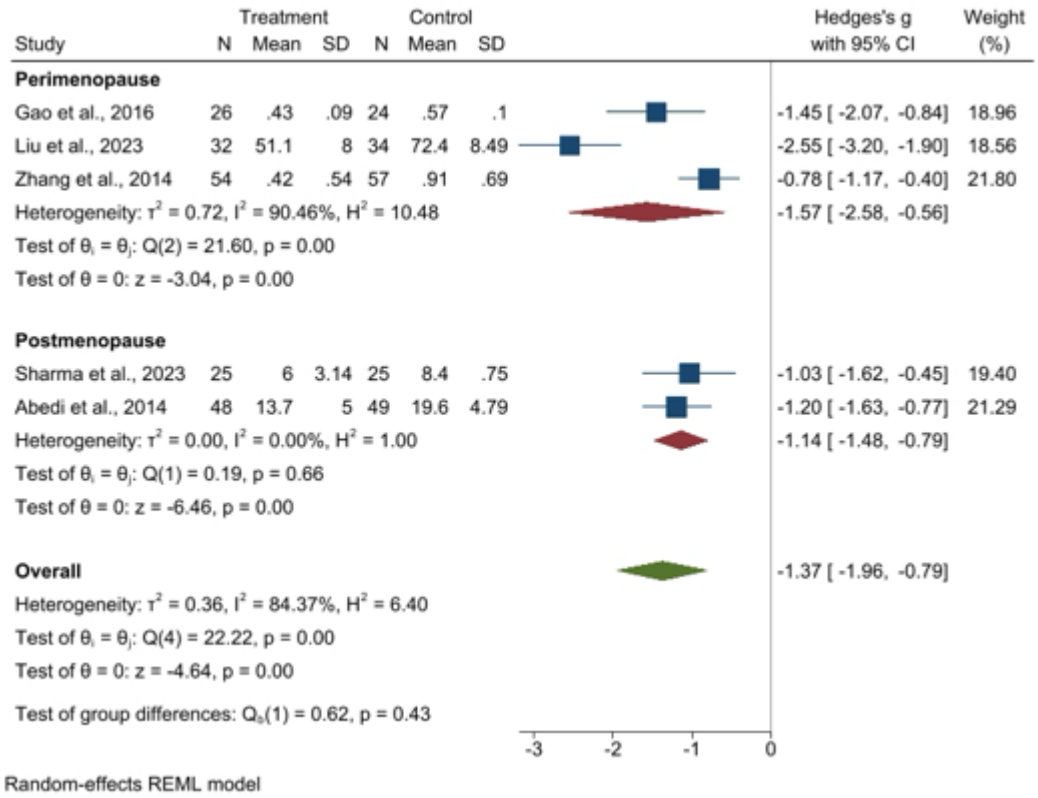
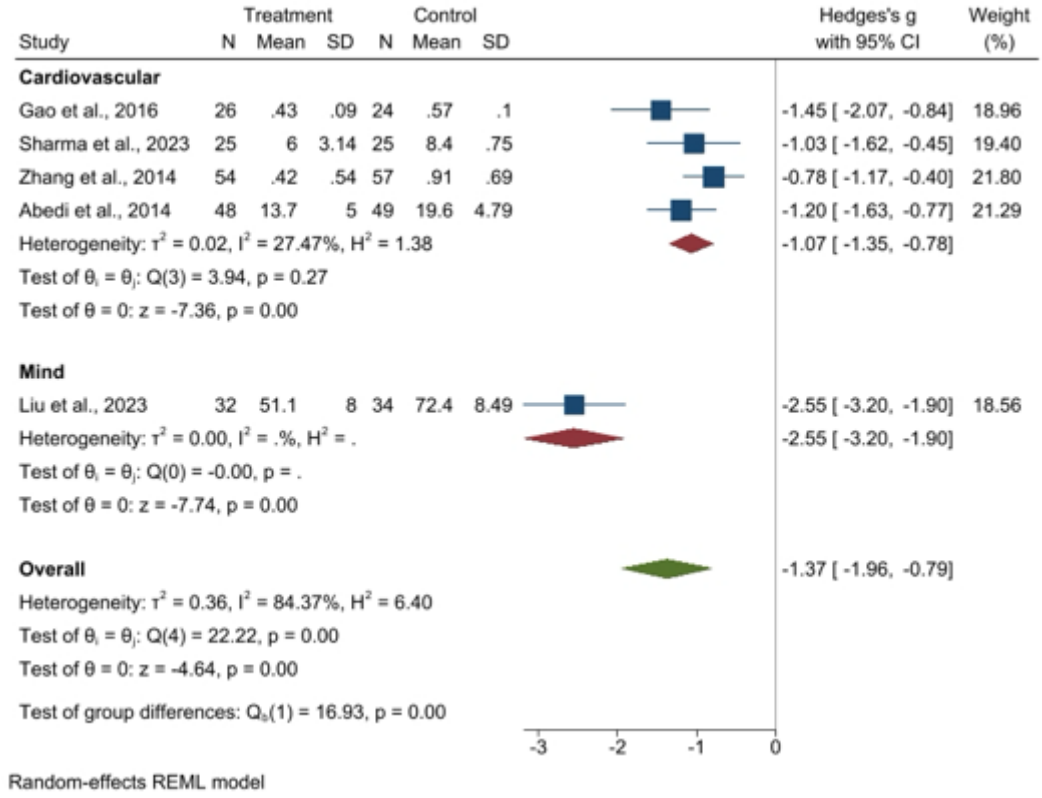


Figure 6

Forest plot of subgroup analysis by intervention type for depression outcomes



ii. Mood

Two studies (n=86) assessed the effect of PA on overall mood (Figure 7). Pooled analysis revealed a large significant effect in favour of PA compared to control (g= 0.84, 95% CI [0.40, 1.29]). No heterogeneity was observed between studies (I^2= 0.00%).

The participants of both studies were in early postmenopause, therefore only subgroup analysis by intervention type was conducted. As seen in Figure 8, a large significant effect of ABIs on mood was found (g=1.05, 95% CI[0.52, 1.58], I^2= 0.00%). As only one study featured an MBI, subgroup analysis was not conducted.

Figure 7

Forest plot of meta-analysed mood outcomes

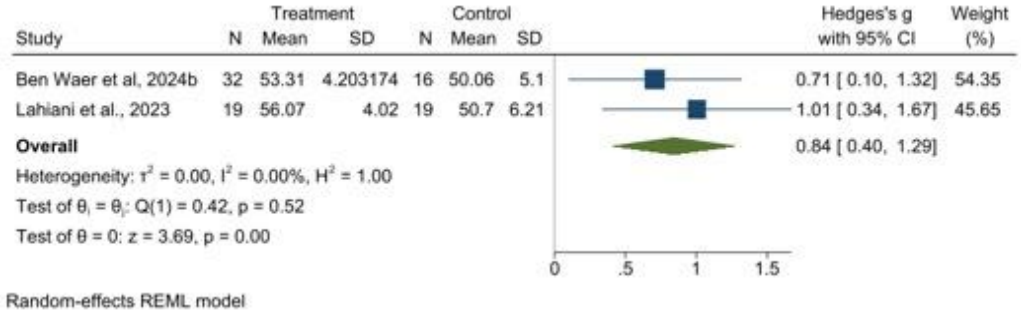
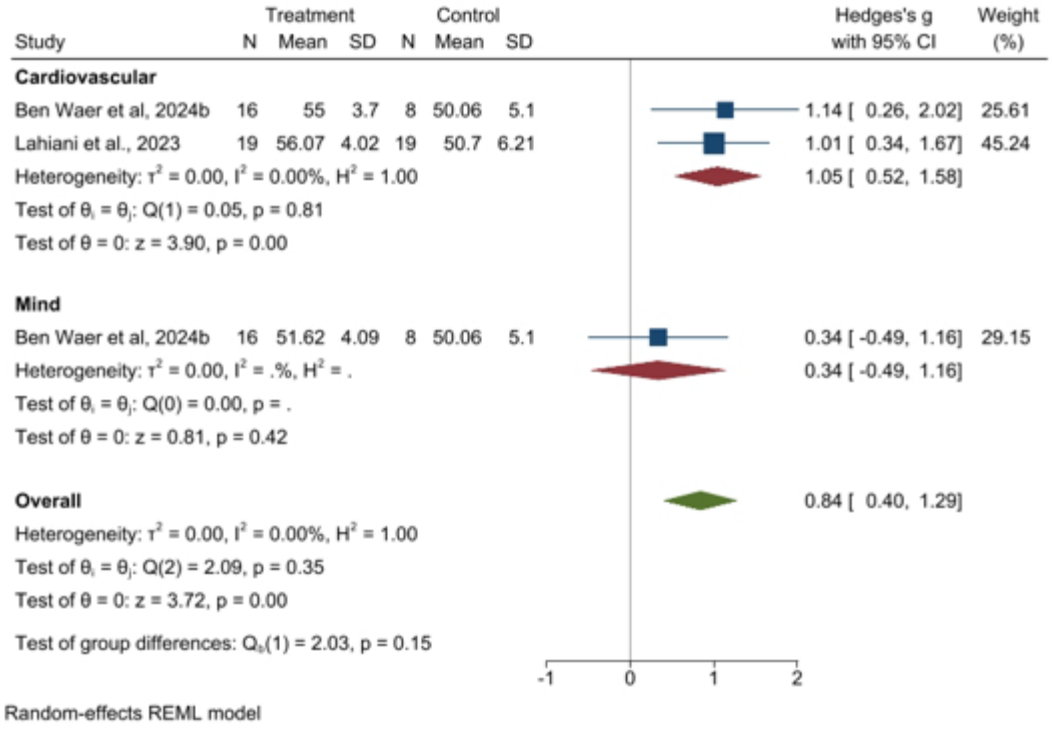


Figure 8

Forest plot of subgroup analysis by intervention type for mood outcomes



iii. Psychological Quality of Life

Six studies (n=617) examined the effectiveness of PA interventions on psychological quality of life (Figure 9). Data were pooled using post-test comparisons. There was a significant improvement in psychological QoL following PA, compared to control, with a moderate effect size (g=0.66, 95% CI [0.19, 1.13]). However, heterogeneity in the model was high (I^2=84.69%), suggesting that the true effects varied substantially across studies. Subgroup analyses were conducted to explore potential sources of heterogeneity.

As only one study included both perimenopausal and postmenopausal participants, the subgroup analysis by menopause stage was limited to only postmenopausal women (Figure 10). Based on five studies, a significant, moderate effect was found in favour of PA compared to controls (g=0.68, 95% CI [0.09, 1.28]), though heterogeneity remained high (I^2=85.42%). Intervention type was also explored (Figure 11). For the four studies involving ABIs, a large but non-significant effect was observed (g=0.93, 95% CI [-0.22, 2.17]), with very high heterogeneity (I^2 = 93.92%). In contrast, based on three studies including MBIs, a significant, large effect size was observed (g=0.80, 95% CI [0.43, 1.16]) also with moderate heterogeneity (I^2=32.71%). No significant difference was found between the effect of ABI and MBI on psychological QoL.

Figure 9

Forest plot of meta-analytic psychological QoL outcomes

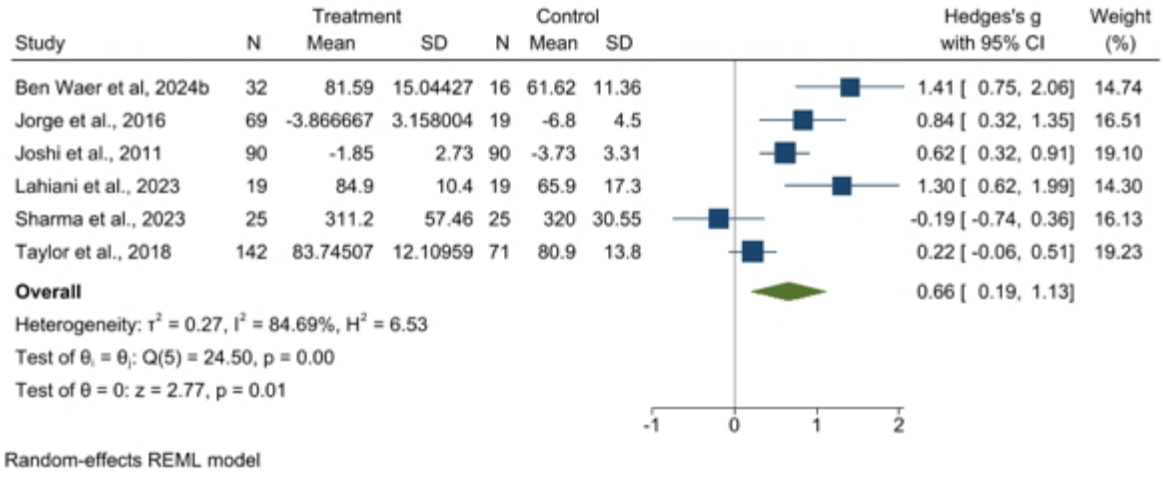


Figure 10

Forest plot of subgroup analysis by menopausal stage for psychological QoL outcomes

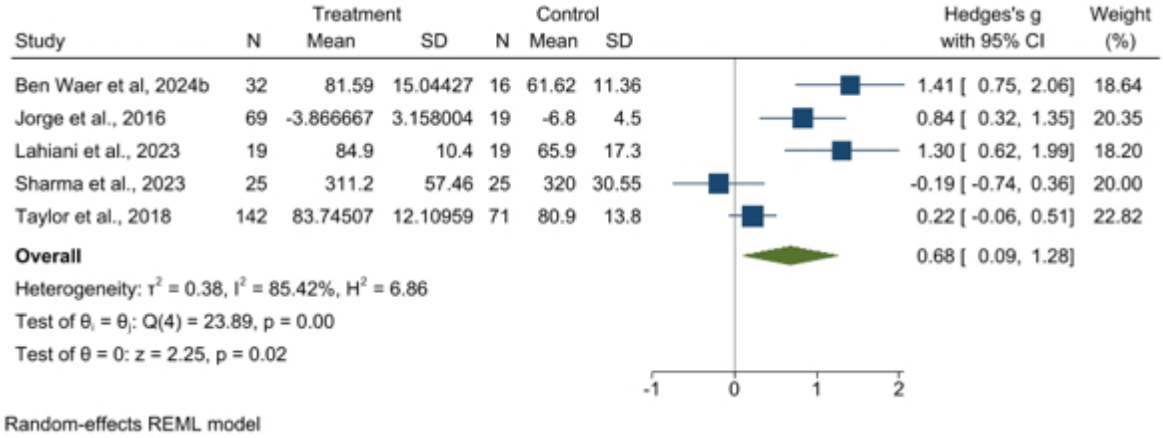
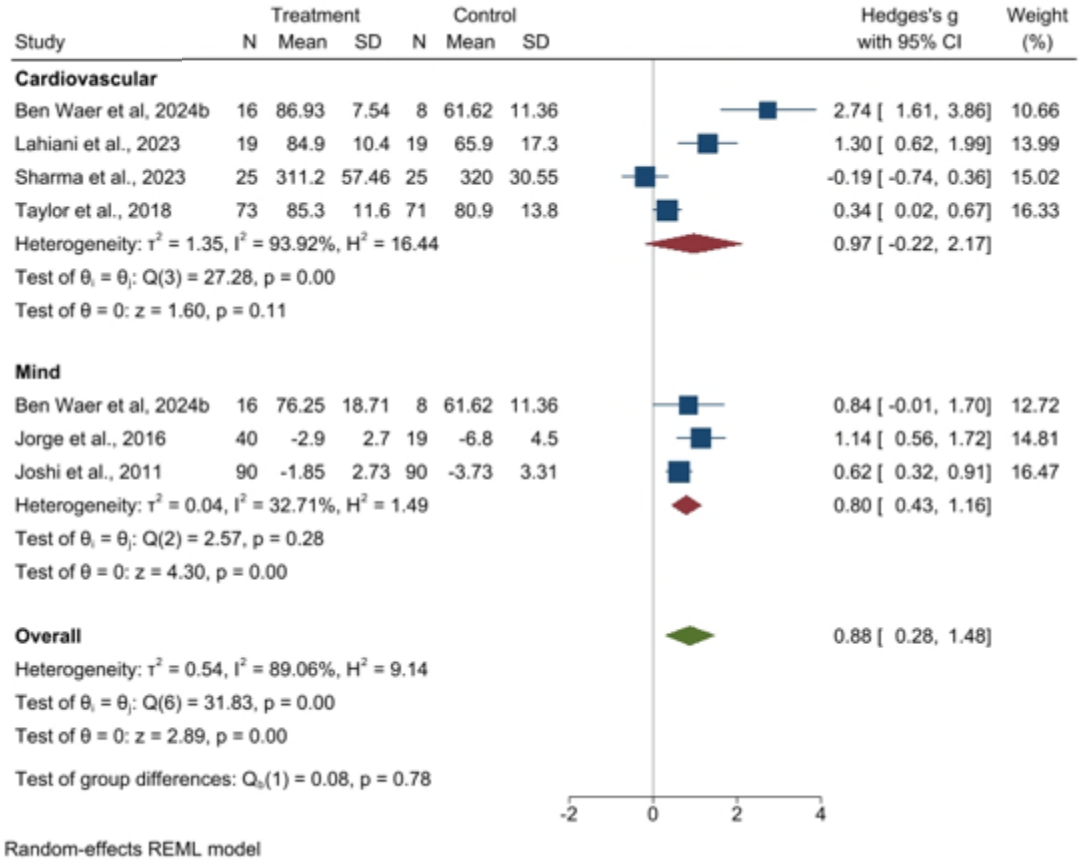


Figure 11

Forest plot of subgroup analysis by intervention type for psychological QoL outcomes



iv. Overall Quality of Life

Data from three studies (n=110) were included in a meta-analysis using post-test comparisons (Figure 12). The pooled analysis showed a large and significant effect of PA on overall QoL, compared to control (g=1.10, 95% CI [0.32, 1.88]), with high heterogeneity (I^2=72.37%).

As these studies all included postmenopausal participants, no subgroup analysis by menopause stage was conducted. Subgroup analysis by intervention for three studies found a large, significant effect of ABIs (g=1.41, 95% CI [0.12, 2.69]), with high heterogeneity (I^2=85.58%) (Figure 11).

Figure 12

Forest plot of meta-analytic overall QoL outcomes

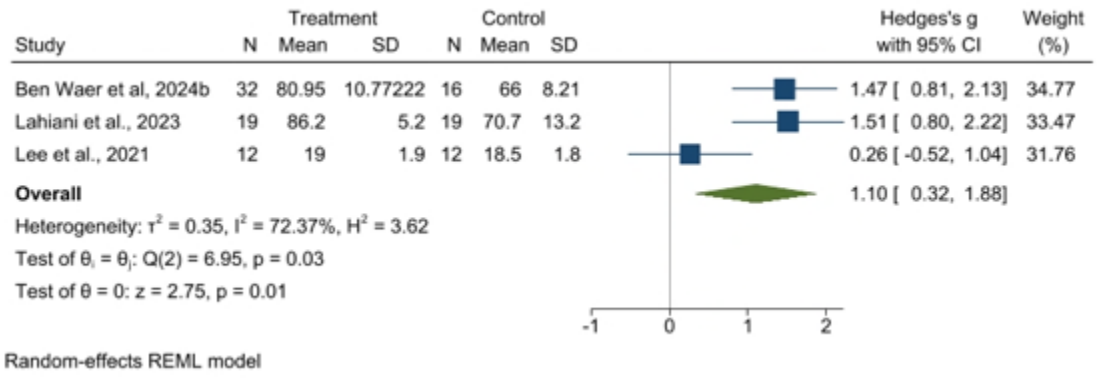
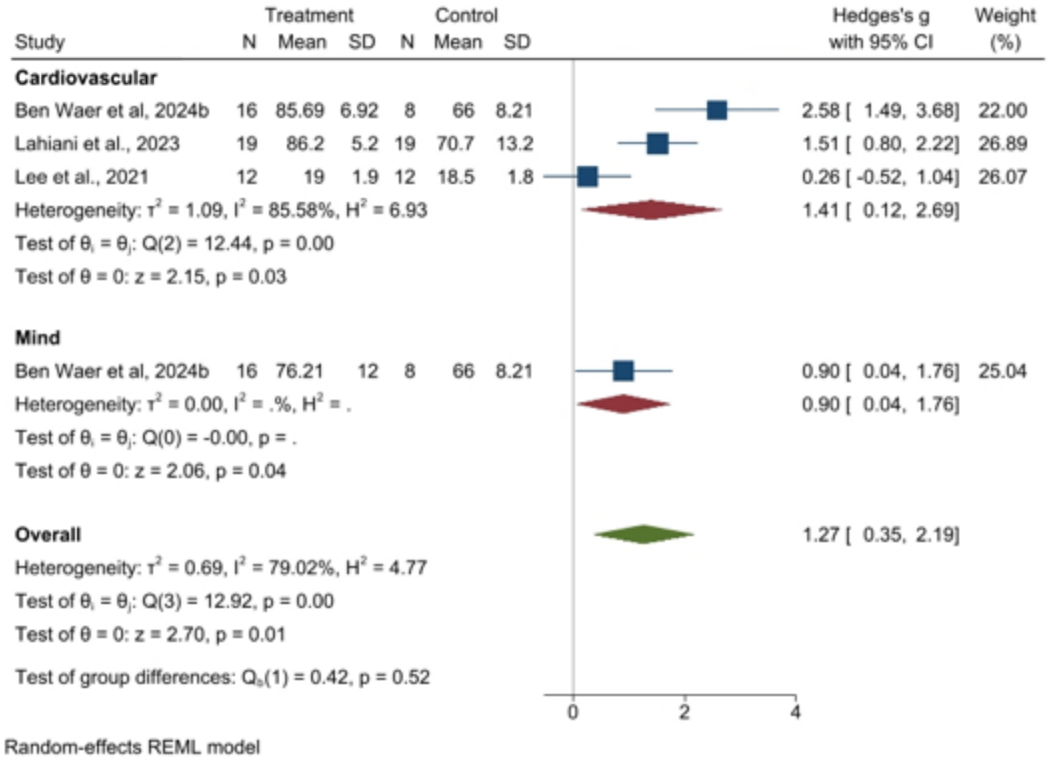


Figure 13

Forest plot of subgroup analysis by intervention type for overall QoL outcomes



Sensitivity analyses using pre-post change scores were conducted to assess the robustness of the primary post-test comparison findings. Results were consistent with the post-test comparisons for depression, menopause stage subgroup analysis for depression, psychological QoL, and intervention type subgroup analysis for psychological QoL in terms of direction, magnitude of effect, and statistical significance. This reinforces the robustness of the main findings (Appendix A, Figures A5-A14). However, discrepancies were also observed. The postmenopause subgroup analysis for psychological QoL revealed a non-significant, moderate pooled effect size, contrasting the significant effect found in the post-test analysis (g=0.68, 95% CI [-0.12, 1.49]). For overall QoL, a large, non-significant pooled effect of PA was observed (g=1.33, 95% CI [-0.07, 2.73]), which differs from the significant effect found in the post-test analysis. In the ABI subgroup analysis for overall QoL, a large, pooled effect remained, however the change score analysis yielded a non-significant effect (g=1.50, 95% CI [-0.24, 3.23]. These differences may reflect increased sensitivity to change when baseline values are accounted for, highlighting the value of including change score models in meta-analytic research.

Narrative synthesis

Six studies reporting various psychological wellbeing outcomes were narratively synthesised, of which one was not included in the meta-analysis (Ben Waer et al., 2024a) due to limited data available.

i. Depression

Jorge et al. (2016) found yoga to significantly improve depressive symptoms compared to both control and aerobic exercise groups ($p<.01$) in postmenopausal women, as measured by the BDI. For perimenopausal women, Tai chi, was found to significantly improve depression when compared to a control group ($p<.01$) (Liu et al., 2023). Both studies provide evidence for the effectiveness of MBIs on depression.

ii. Anxiety

Despite reductions in anxiety levels being observed, Jorge et al. (2016) reported non-statistically significant differences in state anxiety between yoga, aerobic exercise and control groups at post-intervention. The authors attributed this to low baseline anxiety scores which may have limited the potential for observable improvement.

iii. Mood

Lee et al. (2021) reported a significant reduction in negative affect amongst postmenopausal women, as measured by the PANAS-NA scale, following a 16-week Taekwondo intervention ($p<.05$).

iv. Psychological QoL

Joshi et al. (2011) reported significant improvements in psychological QoL following a yoga intervention, compared to a control group ($p<.001$), amongst both peri and postmenopausal women, supporting the use of yoga as a PA intervention for women across menopause stages.

v. QoL

Jorge et al. (2016) found that participants who received a yoga intervention experienced significantly greater improvements in overall QoL compared to those in aerobic exercise and control groups, as measured by the WHO QoL-BREF. Post-intervention comparisons revealed statistically significant between-group differences favouring the yoga intervention ($p<.001$). Ben Waer et al. (2024b) also found Pilates to significantly enhance overall QoL ($p<.001$) these improvements were even greater in the Zumba group ($p<.05$). Taking the findings of these two studies together, both ABIs and MBIs may be effective for enhancing overall QoL.

vi. Cognition

No statistically significant improvements were reported by Ben Waer et al. (2024a) on working memory in postmenopausal women, following a Zumba intervention.

vii. Stress

Significant between-subject differences in post-intervention stress scores were found, with greater reductions for participants in a yoga group compared to aerobic exercise and no-treatment controls ($p<.001$). There was a 35% increase in participants in the yoga group reporting ‘no stress’, indicating the clinical relevance for stress reduction (Jorge et al., 2016).

Discussion

This systematic review and meta-analysis examined the effectiveness of PA interventions on non-physiological outcomes amongst women experiencing peri and early postmenopause. The findings provide promising evidence for PA to support and improve their psychological wellbeing, particularly depression and psychological QoL. Additional benefits were also indicated for mood and overall QoL. Whilst heterogeneity was substantial for some outcomes, limiting the robustness of these models, the overall direction of findings highlights the potential of PA as a non-pharmacological approach for managing menopause-related psychological symptoms. Narrative synthesis findings supported the meta-analytic results, highlighting the potential benefits of both ABIs and MBIs, with the strongest evidence emerging for depression, mood and overall QoL. Overall, most studies were rated as

having a high risk of bias due to the use of self-report measures and per-protocol analyses.

A significant, large, pooled effect was found for depression, with subgroup analysis confirming large, significant effects for both perimenopausal and postmenopausal women. This suggests that PA may be beneficial for alleviating depressive symptoms regardless of menopause stage, which is consistent with evidence indicating elevated risk of depression during both peri and postmenopause (Alblooshi et al., 2023; Badawy et al., 2024). These findings are supported by a prior meta-analysis by Perez-Lopez et al. (2017) who highlighted the effectiveness of PA for significantly reducing depressive symptoms in women aged 40 and above. As symptom severity and diversity are thought to peak during late perimenopause (Cunningham et al., 2025; Santoro, 2016), it is possible that some perimenopausal participants were in the late phase, potentially contributing to the large observed effects. The high heterogeneity observed across studies with perimenopausal participants reflects possible variation in intervention protocol and delivery. Notably, one study in the meta-analysis used an active control which may have attenuated the between-group differences as both the intervention and active control group may have benefited from PA. Despite this, the meta-analysis for depression yielded a large, pooled effect, therefore strengthening the evidence of PA for reducing depressive symptoms in menopausal women.

Furthermore, the current review found large, significant effects of ABIs on depression, with low heterogeneity, suggesting the benefits of this intervention type was consistent across studies. No comparison could be made with MBIs due to the limited number of studies available for subgroup analysis. A recent meta-analysis by Liu and Tang (2025) supports these findings are it demonstrated significant reductions in depression amongst menopausal women following vigorous and moderate-to-vigorous intensity PA. These intensities, which were defined as ≥6 METs and 3-6 METs, respectively, align with the recommended METs levels for cardiorespiratory fitness intensity for women of menopausal age (Franklin et al., 2022). Therefore, the findings of Liu and Tang (2025) reinforce the effectiveness found for ABIs in the current review. Nevertheless, there is a need for further research the investigate the effectiveness of MBIs on depression which can help

determine whether particular PA modalities are more effective for different menopause stages.

For mood, a significant large effect and no heterogeneity between studies, was observed. However, this is only applicable to postmenopausal women. Although only two studies were included in the analysis, they both yielded moderate to large effect sizes. This, together with the absence of heterogeneity, strengthens the reliability of the direction of effects. Nevertheless, the small number of studies warrants cautious interpretation. Narrative evidence supported the analysis, particularly the potential of ABIs. These findings suggest a promising role for PA in supporting the mood of postmenopausal women, though further research is needed for a more robust evidence base, and to examine the effects for perimenopause, and of MBIs.

The evidence suggests that PA does significantly improve psychological QoL, as demonstrated by the moderate and significant pooled effect size. Significant effects were also found for postmenopausal women and MBIs, the latter demonstrating more consistent outcomes across studies. These findings build on a recent meta-analysis by Spector et al. (2024) which reported similar improvements in psychological QoL following psychosocial interventions that specifically targeted psychological wellbeing. The large effect observed in the current review for MBIs demonstrates that the integration of mind-body elements such as mindfulness or body awareness into PA, may offer similar benefits through mechanisms such as emotion regulation, interoceptive awareness and autonomic nervous system regulation (Lazzarelli et al., 2024; Streeter et al., 2012; Wang et al., 2024).

Although only three studies were included in the analysis for overall QoL, a large and significant pooled effect of PA was observed. Subgroup analysis by intervention type suggested that ABIs may lead to meaningful improvements in overall QoL. These findings align with previous reviews demonstrating the effectiveness of aerobic based PA, such as aquatic exercise, on improving QoL (Trujillo-Munoz et al., 2025; Zhou et al., 2023), thus adding to the evidence base. However, the included studies focused solely on postmenopausal women, limiting the generalisability to those in the MT. It is also important to interpret the findings

with caution as only three studies were included in the meta-analysis for overall QoL. Narrative synthesis findings from Jorge et al. (2016) and Ben Waer et al. (2024b) indicated potential benefits for both ABIs and MBIs. This fits with the broader literature showing different modes of PA to enhance QoL across diverse populations, including breast cancer survivors (Sun et al., 2023), and those with psychiatric and neurological conditions (Marquez et al., 2020; Yang et al., 2025).

The review also highlighted limited but informative findings for anxiety, cognition and stress. Evidence suggests yoga may help reduce stress, however the findings for anxiety and cognition were inconclusive due to possible low baseline levels of anxiety and no changes in working memory. This therefore limits interpretation and conclusions being drawn. Further research in these areas is clearly warranted, especially given the prevalence of these symptoms during menopause (Avis et al., 2001; Conde et al., 2021; Gordon et al., 2016; Mulhall et al., 2018).

Sensitivity analyses using pre-post change scores largely supported the main findings, reinforcing their robustness across outcomes including depression, psychological QoL and subsequent subgroup analyses. The results were broadly consistent in terms of direction, size and significance of effects. However, some differences emerged. Non-significant effects were yielded for the pooled effect size for overall QoL, the postmenopause subgroup analysis for psychological QoL and the ABI subgroup analysis for overall QoL, contrasting the significant post-test findings. These differences suggest that accounting for baseline scores may provide a more sensitive estimate of intervention effects, particularly in studies with small samples or baseline imbalances, highlighting the value of including change score models alongside post-test comparisons in meta-analytic research.

Across the 12 interventions included in this review, an MBI (yoga) had the highest number of total sessions (n=90) and the average ‘dose’ of MBIs was higher than that of ABIs. This may reflect the structure of MBI protocols, which typically involve repeated practice and gradual skill development. However, these average doses should be interpreted with caution as there were fewer MBIs, making the mean more sensitive to outliers, such as the 90-session intervention. There were

also three interventions for which total sessions could not be calculated. Despite this, the average doses for ABIs and MBIs offer preliminary insight. ABIs showed large, significant effects for improving depression and overall QoL, at lower average doses, suggesting they may deliver benefits more efficiently. In contrast, MBIs produced large, significant effects on psychological QoL, which may indicate that longer engagement in these interventions may yield greater psychological benefits. Future research should aim to establish dose-responses relationships as this will clarify optimal intervention doses for each modality, which is important to consider for midlife women facing practical constraints and multiple responsibilities.

Variation in how included studies handled and reported on HRT use, may have influenced outcomes. Therefore, this should be considered when interpreting results. The inconsistency across studies makes it difficult to establish the extent to which improvements in non-physiological symptoms of menopause could be attributed to PA alone. As HRT can alleviate vasomotor symptoms, which can in turn improve mood and psychological wellbeing, it is possible that observed intervention effects could have been partly driven by pharmacological support, rather than the PA intervention. On the other hand, the samples in studies that excluded women on HRT may have had greater baseline symptom burden, potentially inflating the observed improvements. Differences in whether and how HRT use was accounted for may therefore have contributed to heterogeneity across studies and the extent to which improvements can be solely attributed to PA remains unclear.

Strengths and limitations

A key strength of the current review is its improved clinical and conceptual homogeneity compared to previous reviews. Only studies comparing PA interventions to TAU or other PA interventions were included, avoiding confounding effects from comparators with distinct therapeutic mechanisms, such as CBT. This enhances the internal validity of the meta-analysis by allowing clearer attribution of effects to PA interventions themselves and supports clinically meaningful comparisons. The isolation of psychological QoL as a distinct outcome is also a strength of this review, contributing to the enhanced conceptual clarity. It allowed for a more precise synthesis whereby the review was better able to capture

psychological domains of QoL and account for the variation in how QoL was measured across studies. In addition, only RCTs were included, strengthening the methodological rigour and reducing bias. The protocol was also prospectively registered, and risk of bias was assessed using the Cochrane RoB2 tool (Sterne et al., 2019).

A further strength is the inclusion of sensitivity analyses using pre-post change scores. This allowed for additional examination of intervention effects in the presence of baseline group differences and produced results largely consistent with the primary post-test comparison, thereby increasing confidence in the overall findings. The review had a diverse range of study samples as studies were conducted across multiple continents. They also included women from varied educational, occupational, marital and ethnic backgrounds, though the reporting of demographic data was inconsistent. Nevertheless, the available data suggests sociodemographic variability, enhancing the external validity of the review and supports the broader applicability of PA interventions for improving psychological wellbeing in women from peri to early postmenopause.

Despite its strengths, limitations should also be acknowledged. First, only post-intervention assessment timepoints were used. Whilst this aided comparisons with other reviews, it prohibited the analysis of, and drawing conclusions about, the sustained effects of PA interventions. Furthermore, substantial heterogeneity was observed across most analyses, limiting the generalisability of the pooled effect sizes. Whilst a random-effects model was applied to account for this, and heterogeneity is common in behavioural intervention research (Cuijpers et al., 2020; Conn et al., 2011; Linden & Hönekopp, 2021), the variability in intervention type, intensity, duration, and participant characteristics may have influenced the results. However, it may also reflect meaningful clinical differences rather methodological inconsistency alone. These findings highlight the value of subgroup analyses and the need for detailed, standardised reporting in future trials to better understand sources of variability. In addition, the inconsistent reporting and exclusion of HRT use across studies introduced further uncertainty, making it difficult to fully isolate the effects of PA.

Analyses were limited by small numbers of studies, particularly mood, overall QoL, perimenopausal women and MBIs. As such, these findings should be interpreted cautiously and considered as preliminary evidence due to the limited generalisability of the pooled estimates. Furthermore, the multiple subgroup and sensitivity analyses conducted increases the risk of Type I error (Li et al., 2017). The number of studies included in each meta-analysis were below the recommended minimum of 10 studies for reliably detecting publication bias using funnel plots and Egger's test (Higgins et al., 2022; Sterne & Harbord, 2004; Sterne et al., 2011). The small number means these tests have lower power to detect true asymmetry and may produce misleading results. Therefore, firm conclusions about publication bias cannot be made.

Whilst this review included both perimenopausal and early postmenopausal participants, only the latter were required to meet a clearly defined staging criterion. This was the ensure that postmenopausal women were in the early stage. Perimenopause is typically used as a general term in the literature to capture both early and late stages. The absence of clearly defined perimenopause stages may have introduced some variability in how these participants were classified. Future research would benefit from clearly defining perimenopause into early and late stages, particularly in line with validated frameworks such as the STRAW+10 criteria.

A further limitation relates to the inclusion of two studies in which participants were recruited on the basis of having obesity and metabolic ill health as risk factors for chronic diseases (Lee et al., 2021; Taylor et al., 2018), rather than diagnosed chronic physical health problems. It can be argued that their inclusion strengthens the evidence base by highlighting the potential for PA interventions to support non-physiological symptoms and psychological wellbeing in menopausal women at heightened health risk. However, obesity and metabolic ill health may also influence the presentation and severity of non-physiological symptoms during peri and early postmenopause. Therefore, including these studies may have contributed heterogeneity and the pooled estimates may not fully reflect the experiences and symptoms of women without these risk profiles. This should be taken into account when interpreting the pooled findings and caution should be taken when generalising the results to broader community populations.

Only studies that explicitly reported in the inclusion criteria or results that participants were more than 5 years postmenopausal, were excluded. Studies that did not report postmenopausal duration were included in this review, thus may have involved women in late postmenopause, raising the possibility that some participants did not reflect early postmenopause. This introduces potential variation in menopausal stage which may affect the applicability of the findings. However, the inclusion criteria of 40-65 years was intended to ensure that the sample was midlife menopausal women as this is a stage of life characterised by distinct biological, psychological and social changes, and a heightened vulnerability to psychological distress. Whilst future research should aim for more operationalised definitions of early postmenopause, tentative conclusions can be drawn from the current study, in the context of midlife.

Whilst studies that included self-directed or partially self-directed PA interventions may enhance real-world applicability, the absence of adherence data makes it difficult to determine the true extent of participant engagement. Therefore, inconsistent participation could have weakened intervention efficacy.

Implications for future research

This review highlights the need for methodological rigour to be improved across future research. Most studies included in this review were rated as having a high risk of bias, primarily due to reliance on self-report measures, lack of blinding and per-protocol analyses. Thus, researchers should ensure statistical analysis plans are published in advance where possible, and intention-to-treat analyses are conducted in cases of missing data to reduce bias and improve replicability (Sterne et al., 2019). Moreover, future trials should include longer follow-up periods beyond the immediate post-test timepoint to determine the sustainability of psychological benefits following PA interventions.

Anxiety was notably under-represented in the included studies, despite being commonly reported by women undergoing menopause (Alblooshi et al., 2023; Mulhall et al., 2018). Future research should prioritise anxiety as a primary outcome alongside other under-examined symptoms such as stress and cognitive difficulties

which too are frequently reporting during menopause yet were rarely assessed. Including these outcomes would allow for a more comprehensive evaluation of the psychological impact of PA for menopausal women. The effectiveness of PA is unlikely to be uniform across individuals. Factors such personal preference, enjoyment and adherence are likely to influence outcomes, shaping both the acceptability and sustainability of interventions. Considering these individual differences may help explain variability in findings in addition to supporting the development of more tailored approaches to intervention design.

There is much literature comparing PA to psychological interventions. Superiority trials incorporating cost-benefit analyses would be valuable for identifying the most feasible and effective interventions for improving psychological wellbeing amongst menopausal women. This is particularly relevant for comparing the cost-effectiveness and adherence demands of ABIs and MBIs. Determining the minimal effective dose for each intervention type will help inform clinical guidelines and ensure that recommended interventions are not only effective, but also scalable and feasible for widespread use.

Further research is also needed to understand for whom and under what conditions PA is most effective. Subgroup analyses suggest variability in effects by menopausal stage and intervention type, but small study numbers limited interpretation. Larger, adequately powered trials are needed to explore moderating factors such as baseline symptom severity, hormonal status, adherence, or intervention modality, given the sociocultural variability in menopausal experience (Korikian, 2024; Melby et al., 2005). Future research would also benefit from the consistent application of menopausal staging criteria for perimenopause as well as postmenopause, improve clarity and comparability across studies. In addition, consistent and clear reporting of HRT use is essential to allow future trials to explore its potential role as a moderator and to obtain a more reliable understanding of PA-specific benefits, rather than effects that may partly reflect HRT.

The high heterogeneity observed across several analyses emphasises the need for consistent methodology and clearer reporting in future trials, such as intervention protocols and participant characteristics. Robust adherence monitoring,

particularly for self-directed or unsupervised PA interventions, should also be included in studies, as well as explicit reporting on participant engagement. This will enable more accurate understanding of how much participants adhered to the intervention as it was intended, allowing for investigation of dose-response relationships.

Implications for clinical practice

The findings of this review provide compelling evidence for PA as an effective intervention for supporting psychological wellbeing of menopausal women. Given the limitations of and preferences against pharmacological treatments such as HRT for some women (Cagnacci & Venier, 2019), and waiting times for psychological therapies, PA offers a scalable and cost-effective alternative or adjunct. Healthcare professionals should therefore encourage and promote PA, integrating it into a holistic package of care for women undergoing the MT and early postmenopause.

The benefits observed for perimenopausal women stresses the importance of early intervention during the MT, when symptom burden may be highest. Clinicians should be aware of the psychological risks associated with this period of life and offer PA as an approach to mitigate psychological distress. Clear signposting to local PA opportunities or prescribing exercise (Rowley et al., 2018), such as structured aerobic based exercise programmes when a patient presents with depressive symptoms, could enhance uptake and engagement. PA may be particularly valuable for those who experience subclinical symptoms that impact QoL. Incorporating PA into routine menopause management has the potential to fill a critical gap in service provision and improve QoL for many women.

Conclusion

This systematic review and meta-analysis provides evidence that PA interventions can improve psychological wellbeing in women undergoing the MT or early postmenopause, highlighting their potential as non-pharmacological, scalable interventions. Promising evidence was observed for depression, mood, and both psychological and overall QoL. However cautious interpretation is needed due to the

small number of studies meta-analysed for mood and overall QoL. The high heterogeneity suggests that intervention effects could depend on individual and contextual factors, reinforcing the need for tailored, holistic care. Together with the high risk of bias, this highlights the need for more targeted and methodologically robust research to inform clinical practice.

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Part 2 – Empirical paper

The feasibility and preliminary effectiveness of group-based Compassionate Mind Training for adults experiencing the menopause transition and early postmenopause

Abstract

Background: Menopause presents with a range of biopsychosocial changes that can significantly impact a woman's psychological wellbeing. Self-criticism is a known vulnerability factor during this time, whilst compassion is a potential protective factor. Compassion focussed approaches may be particularly well-suited for this population as they address self-criticism and shame through the development of a compassionate mind.

Method: This feasibility study used an unblinded, single-site randomised controlled design to evaluate an online, group-based Compassionate Mind Training (CMT) programme for peri and early postmenopausal women. Thirty-eight participants were randomised to either CMT plus treatment as usual (TAU) or TAU alone. Feasibility and acceptability outcomes included recruitment, retention, attendance, and measure completion. Exploratory analysis examined changes in psychological outcomes.

Results: Recruitment targets were met, with retention rates of 89.5% for the intervention and 81.6% for the overall study. Attendance was high, and outcome measures showed 100% completion. Preliminary findings indicated large effects for improvements in mood, somatic symptoms, sleep, fears of compassion, self-reassurance, and self-criticism in the CMT group.

Conclusions: The study supports the feasibility and acceptability of online group-based CMT for menopausal women. Preliminary outcomes suggest potential benefits for mental health and quality of life, warranting a fully powered trial.

Introduction

The menopause transition (MT) is a significant life stage for biological females, characterised by hormonal and physiological changes that mark the end of reproductive capability. This transitional phase, referred to as perimenopause, consists of irregular menstrual cycles and fluctuating hormone levels, and is followed by menopause, the permanent cessation of menstruation for 12 months (Dahlgren et al., 2023). After this, women are considered postmenopausal (Dahlgren et al., 2023). Menopause typically occurs around the age of 50 (Gold, 2011), though some women start menopause prematurely or experience medically induced menopause following treatments such as chemotherapy or hysterectomy (Shuster et al., 2010).

Menopause: a complex life stage

Experiences of the MT and postmenopause are influenced by a range of biological, psychological, and social changes that can significantly impact wellbeing. Symptoms include vasomotor disturbances (VMS), commonly known as hot flushes and night sweats, in addition to sleep disturbances and mood fluctuations (Freeman & Sherif, 2007; Moilanen et al., 2010; Mulhall et al., 2018). These occur within a broader context of aging, and can be compounded by other changes, such as caregiving responsibilities, emerging health concerns, and career transitions (Hunter & Rendall, 2007). These stressors can place strain on mental health. A substantial proportion of women across menopause stages report low mood, anxiety and a decline in their quality of life (QoL) (Alblooshi et al., 2023; Avis et al., 2015; Greenblum et al., 2013). This highlights the need to promote good psychological wellbeing during this life stage.

The psychological impact of menopause

VMS affect nearly 80% of menopausal women (Avis et al., 2018) and are associated with anxiety and depressive symptoms (Gibson et al., 2025; Seritan et al., 2010). This relationship is thought to be bidirectional and especially pronounced in those with a history of depression (Natari et al, 2018; Strauss, 2011). However, women without prior psychiatric difficulties may also at increased risk of emotional distress during this time of their life (Freeman et al., 2006; Mulhall et al., 2018).

Psychological distress during this period may be exacerbated by self-criticism, a common cognitive style involving harsh self-evaluation and negative internal dialogues (Hunter & Smith, 2015). Menopausal women may be particularly vulnerable to self-critical thinking. Negative appraisals of menopause symptoms can cause them to focus on perceived physical or psychological decline, reinforcing a sense of inadequacy and loss of control (Hunter & Chilcot, 2013). Cultural narratives framing menopause and ageing as a period of decline can further fuel self-criticism, which may contribute to internalised stigma, shame and a reluctance to seek support (Avis & Crawford, 2007; Mohamad Ishak et al., 2021; Tariq et al., 2023).

Self-compassion for psychological wellbeing

Self-compassion has been identified as a crucial factor for mitigating self-criticism and enhancing emotional resilience (Gilbert, 2014; Leary et al., 2007). It is defined as approaching one's personal difficulties and suffering with care, understanding and a supportive intention. By cultivating a compassionate mindset, individuals can develop healthier coping strategies to navigate challenges with a more balanced and supportive internal dialogue. For women going through menopause, self-compassion has been associated with more positive attitudes towards ageing and menopause (Brown et al., 2016; Young & Kotera, 2022). Therefore, developing self-compassion may serve as an effective means for reducing distress and promoting psychological wellbeing in peri and postmenopausal women (Gilbert, 2014).

The first line treatment for menopausal symptoms is hormone replacement therapy (HRT) and it is prescribed to 15% of women in the UK (gov.uk, 2023). However, there is limited evidence for its psychological benefits (Sharma et al., 2023; Tseng et al., 2023), and there are potential adverse effects associated with it, such as an increased risk of certain cancers, and stroke (Al-Safi & Santoro, 2014; Tavani & La Vecchia, 1999). Consequently, psychological therapies such as Cognitive Behavioural Therapy (CBT) and Mindfulness-based interventions have been explored as alternative strategies for managing menopause-related distress (Spector et al., 2024). These interventions have demonstrated promising effects for anxiety, depression, and QoL (Conklin et al., 2020; Green et al., 2019; Spector et al., 2024). However, a review by Adshead (2000) suggested that traditional

psychological therapy may not adequately target shame-related cognitions and self-perceptions. Furthermore, whilst CBT does increase resilience and improve psychological distress in many clinical samples, research has found Compassion Focussed Therapy (CFT) to have a greater effect (Arabi et al., 2023) and one that is maintained over time (Jalayer et al., 2022).

Why CFT?

CFT is a therapeutic model that offers a promising approach for addressing self-criticism and fostering emotional resilience by improving self-reassurance and acceptance (Gilbert, 2009; Gilbert & Proctor, 2006). Drawing from evolutionary psychology, attachment theory, and cognitive behavioural principles, CFT provides a framework for supporting individuals in developing a more compassionate mind, that can activate the soothing system to regulate difficult emotions. Central to this model is the cultivation of core compassionate qualities, namely wisdom, strength and caring commitment, enabling engagement with rather than avoidance of, suffering (Gilbert, 2014, 2017, 2020; Gilbert & Procter, 2006). CFT also addresses the 'head-heart lag' (Stott, 2007), ensuring that the development of new attitudes is not merely cognitive, but is accompanied by a felt-sense, so that an emotional shift can occur.

CFT conceptualises suffering as an inherent aspect of the human experience. It emphasises "de-shaming" (Gilbert, 2010), helping individuals to understand that difficulties arise outside of their control and choosing, such as early life experiences and temperament (Irons & Lad, 2017). At the same time, it encourages individuals to take responsibility for developing new ways to manage distress and enhance resilience. Embedded within CFT is Compassionate Mind Training (CMT), which is the skills-based training designed to cultivate compassion (Irons & Heriot-Maitland, 2021). CMT incorporates psychoeducation and structured practices, such as soothing rhythm breathing and compassionate imagery, and can form part of CFT or be delivered independently as an intervention. In this way, whilst CFT provides the overarching therapeutic framework, CMT represents the applied method through which compassion is actively developed.

The evidence bases for CMT and CFT have grown in parallel. Self-directed CMT exercises have demonstrated significant benefits for psychological wellbeing in

different populations (Halamová et al., 2020; Matos et al., 2017; Irons & Heriot-Maitland, 2020; Savari et al., 2021) and have been found to be acceptable and feasible for menopausal women (Pickup, 2025). Group-based CMT has also been investigated in community samples, with findings suggesting sustained improvements in distress, self-criticism and wellbeing (Irons & Heriot-Maitland, 2021). Similarly, evidence for CFT as an intervention suggests group-based formats may be particularly effective. A review by Craig et al. (2020) reported stronger effects for group CFT compared to self-help and individual formats, for reducing distress and increasing self-compassion. Preliminary research from Iran has also shown promising effects of group-based CFT in menopausal women (Dolatabadi et al., 2019), although further research is needed to establish its applicability to Western contexts. Given the benefits of group-based CFT-informed interventions, there is scope for implementation with a UK sample of peri and postmenopausal women.

The current study sets out to address this gap in the literature by investigating group-based CMT delivered online, for women in the UK experiencing the MT and early postmenopause. The aims are:

1) To examine the feasibility of group CMT plus treatment as usual (TAU), compared to TAU, in terms of recruitment, retention, acceptability of intervention and outcome measures, willingness to be randomised, and attrition, to inform the design of a future RCT.
2) To examine preliminary effects in terms of depressive and anxiety symptoms, QoL, menopause experience and beliefs, self-critical and self-reassuring thoughts, and self-compassion.

Methods

Study design

The current feasibility study used an unblinded, single site, randomised controlled design to compare an online group-based CMT intervention plus TAU with TAU (only), amongst peri and early postmenopausal women. It was conducted in accordance with an established framework for feasibility research (Eldridge et al., 2016) and was registered with ClinicalTrials.gov (ID: NCT06462157).

The study was jointly carried out by two DClin trainees for their thesis. One trainee (SS) assessed acceptability and feasibility and undertook an exploratory analysis, using quantitative data. The other trainee (KR) analysed qualitative interviews with participants to explore acceptability of the intervention and study design.

Ethics and risk assessment

Ethical approval was granted by the University College London (UCL) Research Ethics Committee (Project ID: 26701/001) and the study followed CONSORT guidelines (Schulz et al., 2010). In accordance with the Mental Capacity Act (2005), participants provided informed consent and had the right to withdraw from the study at any point.

Participants

To be eligible, participants were required to (1) be aged 40-60, (2) be biologically female, (3) fall within stages -2 to +1 of the Stages of Reproductive Aging Workshop (STRAW) criteria (Soules et al., 2001) which represent early perimenopause to early postmenopause (Table 1), (4) experience mild to moderate anxiety (determined by Generalised Anxiety Disorder-7 (GAD-7) score 5-14) (Spitzer et al., 2006) and/or mild to moderate depression (determined by Patient Health Questionnaire-9 (PHQ-9) score 5-19) (Kroenke et al., 2001), (5) have capacity to consent, (6) have substantial English verbal communication and comprehension skills, (7) have access to an internet connection, (8) have access to and ability to use a video conferencing programme, (9) and be available to attend one of the intervention groups if randomised to CMT.

Participants were excluded if they (1) had medically induced symptoms of the menopause, (2) were receiving another psychological intervention, (3) were more than 5 years postmenopause, and (4) experienced severe anxiety and/or depression as scored by the GAD-7 (GAD-7 score ≥ 15) and PHQ-9 (PHQ-9 score ≥ 20).

Participants with severe anxiety or depression were excluded because individuals experiencing severe symptoms are more likely to require comprehensive and individually tailored treatment, such as specialist psychological therapy, which

are beyond the scope of this study. Therefore, by only including those with mild to moderate difficulties, participant safety was prioritised and ensured that the intervention was targeted at a group for whom it was most likely to be feasible and acceptable. The intention of the research is to improve accessibility to psychological support for women across the spectrum of menopausal experiences. As severe symptoms are often more readily identifiable, with services more responsive, focussing on mild to moderate symptoms addresses an important gap in provision that could ultimately be expanded to benefit women across different levels of need.

Table 1

STRAW criteria for menopause staging

STRAW stage	Time relative to FMP	Phase	Characteristics
-2	2 years before FMP	Early Perimenopause	Variable cycle length (>7 days different from normal)
-1	1 year before FMP	Late Perimenopause	≥2 skipped cycles and ≥60 days of amenorrhea
0	FMP	Transition point	Marks the last menstrual period
+1	1 year after FMP	Early Postmenopause	Up to 4years amenorrhea

Notes: FMP= final menstrual period

The study aimed to recruit 40 participants, based on recommendations for sample sizes for feasibility research that vary from 24 to 50 participants (Browne, 1995; Lancaster et al, 2004; Julious, 2005; Billingham et al., 2013).

CMT intervention development

Version 1 of the intervention was adapted from the 8 week CMT course and the self-compassion course, both developed and delivered by Balanced Minds (Irons & Heriot-Maitland, 2021; Northover et al., 2021). The current intervention was developed by HD, a member of the research team who is a Clinical Psychologist with specialist CFT training and experience, with supervision from international CFT expert and researcher Chris Irons. Prior to field testing, AS, an additional member of the research term who is a Professor of Ageing, provided feedback on the intervention. Adaptations included menopause specific psychoeducation as included in the initial sessions, and addressing evolutionary theory and the biopsychosocial

model of menopause (Hunter & Rendall, 2007). These align with the evolutionary neurobiological framework of CFT and the principle that humans are given a body and brain that was not of their choosing, and are shaped by a multitude of experiences, many of which are outside of their control (Gilbert, 2014). The practices and examples presented throughout the sessions were adapted to focus on experiences common to women experiencing all stages of menopause.

HD field tested version 1 with six participants. The intervention was then refined based on feedback from the field testing, in addition to Patient and Public Involvement (PPI) focus groups run by SS and KR. Groups were conducted with peri and postmenopausal women, recruited by social media and forums, and expert clinicians in the menopause field who were recruited by direct contact and forums. The questions asked in the focus groups can be found in Appendix B. Changes to the intervention following feedback included the duration and number of sessions and the visual appearance of study materials. This feedback led to version 2 of the intervention which was used in the current study. PPI input also contributed to the development of the wider study, including the appearance of and wording on the recruitment poster, the content included in the information sheet, and the date and time offerings of the interventions.

Procedure

Recruitment adverts were primarily shared on social media (Facebook, X, and Instagram), in addition to relevant menopause specific forums and newsletters. A QR code directed individuals to an online participant information sheet accessed via Qualtrics (https://qualtrics.ucl.ac.uk/). If interested in the study, participants were asked to complete a pre-consent form and screening measures that followed the information sheet. For the screening process, participants were asked about their age, in addition to the Menopause Representations Questionnaire (MRQ) (Hunter & O'Dea, 2001), PHQ-9, GAD-7, and STRAW criteria identification questions. They were also asked to express their availability for the intervention group from two date and time options. This information was collected for scheduling purposes only, to ensure participants could attend sessions if randomised to CMT. All participants who submitted screening measures had a study ID code allocated to them. Those

deemed eligible were invited to take part in the study by email and given the opportunity to ask questions about the research and their participation, before providing informed consent. Once consent was given, participants were sent online baseline questionnaires to answer, one week before the intervention start date. Once the measures were completed, participants were randomised by their study ID code to either CMT or TAU by a researcher not involved in the conduction of the study, using a web-based randomisation tool (https://www.randomlists.com/). A member of the research team involved in the facilitation of the CMT groups, informed participants of their group allocations. See Figure 1 for the study flow, as guided by CONSORT (Schulz et al., 2010). Appendix B contains all study recruitment materials and outcome measures.

Adverse events were not formally monitored. Instead, participants were informed that they could report any difficulties or concerns to the research team whilst participating in the study. Signposting to relevant support services was provided at the beginning of the PHQ-9 and the end of the questionnaires, at both baseline and follow up. If participants reported distress, the agreed plan was to signpost them to their GP.

Intervention

CMT sessions were facilitated by two members of the research team (SS and KR), who had completed a two-day training course in Compassionate Mind Training, delivered by Balanced Minds. The intervention consisted of six structured sessions that took place online, once a week, for 90-minutes. The sessions were delivered via Microsoft Teams and session materials were presented by Microsoft PowerPoint. The sessions consisted of theoretical education, individual, and small group practices, and reflective discussions. An overview of the session content can be found in Table 2. Each session was structured to ensure consistency in their delivery across the two groups. After each session a follow up email was sent to participants with a summary handout of the session content and practices to be used during the week. A reminder email for each session with the date, time and Microsoft Teams link was sent to participants two days in advance of the following session. There was a week break between sessions four and five, and five and six due to the availability of the intervention facilitators. Following the end of the six sessions, participants

were invited to complete the online follow up measures, shared with them via email by a member of the research team.

As part of the CMT intervention, psychoeducation about compassion and its qualities, the three systems model of emotional regulation, and the evolution of 'tricky brains' was provided. This was to help participants recognise their thinking-emotion 'loops' and to understand why they might experience emotional imbalance. Experiential exercises, such as guided breathing, imagery practices and letter writing, helped participants to connect with and use their compassionate minds. Each session was structured to include time at the beginning for participants to share reflections from the previous session, as well as embedded opportunities throughout for pair and group discussion around session topics (e.g. the biopsychosocial model). Space was also provided after experiential exercises for participants to reflect together or in small groups on their experiences, fostering connection, normalising common barriers and supporting collective learning. Where appropriate for CMT skills such as pattern shifting, practises carried out in pairs or small groups to encourage mutual support. Participants were encouraged to engage in home practice of the exercises to strengthen their use of the skills taught. People allocated to CMT continued to receive TAU.

Table 2

Summary of CMT intervention session content

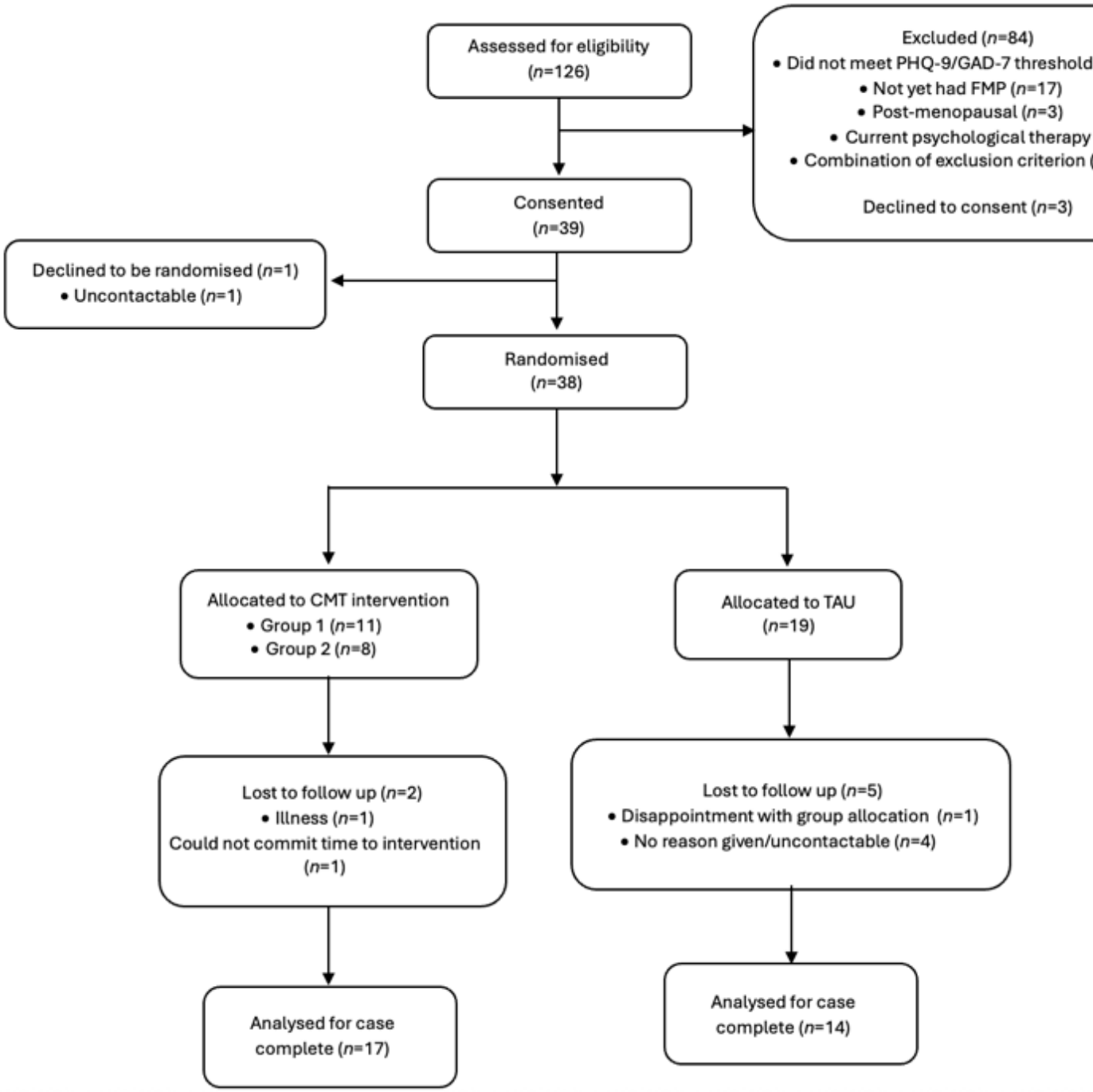
Session	Content
1	Introduction, group orientation and aims, what is compassion, Self-soothing Rhythm breathing exercise, three flows of compassion and relation to the menopause.
2	Exercise practice, reflections and feedback, Biopsychosocial model, Trick brains, three-systems model and compassionate self-exercise
3	Reflections and feedback, pattern shifting exercise, fears blocks and resistances to self-compassion and compassionate others.
4	Reflections and feedback, compassionate other exercise, PDA pattern switching and compassionate letter writing.
	1 week gap
5	Reflections and feedback, SELF CARE exercise, Understanding self-criticism information and exercise, Imagery exercise of self-critic and Compassion for the self-critic exercise.
	1 week gap
6	Reflections and feedback, Shame self-critics vs. compassionate self-correction, Compassion in the mirror exercise and final farewells.

Treatment as usual (TAU)

TAU was defined as participants continuing with their usual day-to-day care, which could have included HRT, different forms of contraception and psychiatric medication, which was collected as part of the participant demographic data. There were no changes to usual care as a result of participating in the trial. Once the six sessions of CMT had ended, participants in the TAU group were also sent the online follow up measures via email.

Figure 1

CONSORT diagram of flow of participants through the study



Feasibility and acceptability

The purpose of this feasibility study was to establish the required parameters to progress to a definitive trial. This was assessed using 'Stop/Review/Go' indicators for most of the feasibility parameters. These were as follows:

1. Recruitment of target sample size: Go: 35-40 participants, Review: 28-34; Stop: <28 (Browne, 1995; Lancaster et al, 2004; Julious, 2005; Billingham et al., 2013).
2. Recruitment of participants within the 2-month recruitment period from June to July 2024: Go: ≥75%; Review: 50-74%; Stop: <50% (National Institute of Health and Care Research (NIHR), 2019; Teare et al., 2014).
3. Overall retention from recruitment to post-intervention follow up data collection: Go: ≥75%; Review: 50-74%; Stop: <50% (Millard et al., 2023; NIHR, 2019).
4. Reasons for drop out.

Acceptability was assessed quantitatively, with 'Stop/Review/Go' indicators set for some parameters. It was also assessed qualitatively though this is not reported herein. Acceptability of randomisation was determined by: (1) the target sample being reached, and (2) whether there was a difference in number of dropouts between CMT and TAU. Acceptability of the intervention was assessed by:

1. Overall attendance rate: Go: ≥70%; Review: 50-69%; Stop: <50%
2. ≥75% of participants completing at least three of the six sessions
3. Retention rate of CMT participants to the intervention: Go: ≥75%; Review: 50-74%; Stop: <50% (NIHR, 2019)
4. Negative or adverse events relating to the intervention.

Acceptability of the outcome measures was determined by completion of outcome measures across both groups: Go: ≥90%; Review: 70-89%; Stop: <70% (Mellor et al., 2023; NIHR, 2019).

Outcome measures

All outcome measures (Appendix B) were administered at baseline and after the six-session intervention. Demographic and clinical data were collected via self-report. Demographic data included age, ethnicity, education level, occupation and use of HRT, contraception and psychiatric medication.

i. Menopause Representations Questionnaire (MRQ)

The MRQ (Hunter & O'Dea, 2001) is a seven subscale questionnaire. The Identity subscale consists of 20 items, assessing the extent to which different symptoms are attributed to their menopause experience. Items are scored as No (0), Uncertain (1) or Yes (2). The additional six subscales consist of 17 items that evaluate beliefs about menopause: Negative impact, Relief, New phase, Control, Time (short) and Time (long). Items are scored from Strongly disagree (1) to Strongly agree (5), with the mean calculated for each subscale's items. Higher scores reflect stronger beliefs about menopause. There is good internal consistency for most subscales (α=.92-.80), except for Time (short) and Time (long) (α=.55 and .54 respectively). Comparisons with the Women's Health Questionnaire (Hunter, 1992) demonstrates its concurrent validity.

ii. Generalised Anxiety Disorder Questionnaire-7 (GAD-7)

The GAD-7 (Spitzer et al., 2006) consists of seven items, measuring the presence of anxiety symptoms in the last two weeks. It is scored from (0) Not at all to (3) Nearly every day. Scores of 5, 10 and 15 are used as cut-offs for the presence of clinically relevant mild, moderate, and severe anxiety symptoms, respectively. Therefore, a lower score indicates less symptomology. It has an excellent internal consistency (α=.92).

iii. Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 (Kroenke et al., 2001) consists of nine items, measuring the presence of depressive symptoms in the last two weeks. It is scored from (0) Not at all to (3) Nearly every day. A score of 10 or more indicates clinically relevant symptoms of depression thus lower scores indicate a lesser presence of symptoms. Cronbach's alpha ranged from 0.83 to 0.90.

iv. Revised Women's Health Questionnaire (WHQ)

The revised WHQ (Girod et al., 2006) is a revised version of the original WHQ (Hunter, 1992). It consists of 27 items which measure different physical and emotional symptoms of the menopause. These symptoms are measured by seven subscales, all scored from (1) Yes, definitely to (4) No, not at all. The subscales are Anxiety/Depression, Wellbeing, Somatic, Memory, Vasomotor, Sleep and an option Menstrual subscale. Higher scores indicate less problems and symptoms. The

Wellbeing and Sleep subscales have poor internal consistency (α=.54 and .55 respectively) whilst all other subscales are acceptable to good (α=.71-.82). There is no internal consistency reported for the Menstrual subscale.

vi. 36-Item Short Form Survey (SF-36)

The SF-36 (Ware et al., 1992) assesses health-related QoL. It consists of eight subscales, measuring different elements of physical and mental health. The subscales are Physical function, Role limitations due to physical health, Role limitations due to emotional problems, Energy, Mental health, Social functioning, Bodily pain, General health and Health transition. A higher score indicates better health status. Internal consistency was assessed in a sample of working age adults and was found to be good for all scales (α=.90-.80) except for Social Functioning which was found to have acceptable internal consistency (α=.76) (Jenkinson et al., 1993).

vii. Fears of Compassion Scales (FCS)

The FCS (Gilbert et al., 2011) consists of three subscales, which are all scored from (0) Don't agree at all to (4) Completely agree. Compassion from others consists of 13 items, Compassion for others consists of 10 items and Compassion for self consists of 15 items. Higher scores indicate greater fears of compassion. Internal consistency was assessed in a sample of therapists and good internal consistency was found for Compassion for self and Compassion from others (α=.86 and .85 respectively) and it was acceptable for Compassion for others (α=.76).

viii. The Forms of Self-Criticising/Attacking & Self-Reassuring Scale (FSCRS)

The FSCRS (Gilbert et al., 2004) is a 22 item measure, scored from (0) Not at all like me to (4) Extremely like me. It assesses different cognitive and emotional responses people have about themselves when things go wrong. These responses make up three subscales; Inadequate self, consisting of nine items, Reassured self, consisting of eight items and Hated self, consisting of five items. Higher scores for Inadequate self and Hated self represent greater self-criticism whilst a higher score on Reassured self represents greater self-reassurance. There is good internal consistently for all scales (α=.90-.86).

Data analysis

Primary analyses were conducted using descriptive statistics to assess feasibility and acceptability parameters. Exploratory analyses of outcomes measures were conducted using IBM Statistical Package for the Social Sciences (version 29). 38 participants were recruited and completed the baseline assessments. Seven participants did not complete the follow up assessments and were therefore excluded from the analysis. A case complete approach was used with the remaining 31 participants. Figure 1 shows the flow of participants into and through the study.

Descriptive statistics are reported using means and standard deviations (SD) for normally distributed data. Median and interquartile range (IQR) are reported for non-normally distributed data. For exploratory analyses of each outcome measure, analysis of covariance (ANCOVA) was used to assess differences between the CMT and TAU groups at post-intervention, adjusting for baseline scores of the outcome of interest as a covariate. As this was a feasibility study and there is a small sample size, the trial was not powered to detect significant changes in secondary outcomes. Therefore p-values are not presented; rather adjusted mean differences between CMT and TAU groups with 95% confidence intervals and Cohen's *d* effect sizes are reported to demonstrate preliminary trends. Cohen's *d* was calculated in Microsoft Excel (version 16.78) using the mean difference and pooled standard deviation, whereby the pooled standard deviation was derived from the square root of the mean square error. Effect sizes of 0.2, 0.5 and 0.8 are considered a small, medium, or large effect, respectively (Cohen, 1988).

ANCOVA assumptions were assessed. Normality was assessed through inspection of Q-Q plots and histograms of residuals, whilst homogeneity of variance was tested using Levene's test of Equal Variance. To ensure that linearity was satisfied, scatterplots were produced and inspected. For outcome measures that violated the linearity assumption, a log transformation was applied before conducting ANCOVA. For reporting and interpretation, the results were back-transformed and absolute differences were manually calculated and presented. Where transformation of the data did not correct linearity, ANCOVA was still conducted. To check for the

homogeneity of regression slopes assumption, the interaction between the baseline score of interest, and group, were tested.

Results

Participants

38 participants were recruited and randomised to either CMT or TAU. Of these, 31 completed the post-intervention assessments. Ages ranged from 42 to 57 years old (M=49.8), with the majority meeting the STRAW criteria for late perimenopause (*n*=16). Full participant demographic data for those included in the analysis can be found in Table 3.

Table 3
Summary of participant demographics

Characteristics	**Total** *n*= 31	**CMT** *n*= 17	**TAU** *n*= 14
Age (years)			
Mean (SD)	49.8 (4.2)	49.1 (4.4)	50.6 (3.9)
Range	42-57	42-57	43-57
Ethnicity			
White	28 (90.3%)	16 (94.1%)	12 (85.7%)
Mixed or multiple ethnic origin	1 (3.2%)	1 (5.9%)	0 (0%)
Other	2 (6.5%)	0 (0%)	2 (14.3%)
Menopause transition stage (n)			
Early perimenopause (-2)	4	2	2
Late perimenopause (-1)	16	11	5
Early postmenopause (+1)	11	4	7
Location			
East Midlands	4 (12.9%)	1 (5.9%)	3 (21.4%)
East of England	1 (3.2%)	0 (0%)	1 (7.1%)
London	4 (12.9%)	2 (11.8%)	2 (14.3%)
North West	1 (3.2%)	1 (5.9%)	0 (0%)
Scotland	5 (16.1%)	3 (17.6%)	2 (14.3%)
South East	7 (22.6%)	4 (23.5%)	3 (21.4%)
South West	5 (16.1%)	3 (17.6%)	2 (14.3%)

West Midlands	2 (6.5%)	1 (5.9%)	1 (7.1%)
Yorkshire	2 (6.5%)	2 (11.8%)	0 (0%)
Employment status			
Full time	12 (38.7%)	4 (23.5%)	8 (57.1%)
Part time	11 (35.5%)	9 (52.9%)	2 (14.3%)
Self employed	5 (16.1%)	3 (17.6%)	2 (14.3%)
Student	1 (3.2%)	1 (7.1%)	0 (0%)
Unemployed (receiving benefits)	1 (3.2%)	1 (5.9%)	0 (0%)
Prefer not to say	1 (3.2%)	0 (0%)	1 (7.1%)
Education level			
Secondary school (GCSE)	4 (12.9%)	4 (23.5%)	0 (0%)
Further education (A-Level)	5 (16.1%)	1 (5.9%)	4 (28.6%)
College or University	16 (51.6%)	9 (52.9%)	7 (50%)
Post grad degree (MSc)	5 (16.1%)	2 (11.8%)	3 (21.4%)
Doctoral degree	1 (3.2%)	1 (5.9%)	0 (0%)
HRT use			
No	6 (19.4%)	5 (29.4%)	1 (7.1%)
Yes	25 (80.6%)	12(70.6%)	13 (92.9%)
HRT duration			
Not using HRT	6 (19.4%)	5 (29.4%)	1 (7.1%)
Less than 6 months	4 (12.9%)	0 (0%)	4 (28.6%)
More than 6 months	21 (67.7%)	12 (70.6%)	9 (64.3%)
Contraception use			
Not applicable/No contraception	22 (71%)	12(70.6%)	10 (71.4%)
Copper coil	3 (9.7%)	2 (11.8%)	1 (7.1%)
Hormonal coil	4 (12.9%)	2 (11.8%)	2 (14.3%)
Combined pill	1 (3.2%)	1 (5.9%)	0 (0%)
Progesterone only pill	1 (3.2%)	0 (0%)	1 (7.1%)
Contraception duration			
Not taking contraception	22 (71%)	12(70.6%)	10 (71.4%)
Less than 6 months	0 (0%)	0 (0%)	0 (0%)
More than 6 months	9 (29%)	5 (29.4%)	4 (28.6%)
Psychiatric medication use			
No	20 (64.5%)	11(64.7%)	9 (64.3%)
Yes	11 (35.5%)	6 (35.3%)	5 (35.7%)

Psychiatric medication duration			
Not taking psychiatric medication	20 (64.5%)	11 64.7%)	9 (64.3%)
Less than 6 months	2 (6.5%)	0 (0%)	2 (14.3%)
More than 6 months	9 (29%)	6 (35.3%)	3 (21.4%)

Feasibility and acceptability

i. Feasibility of recruitment and retention

126 people expressed interest in the study and were screened for eligibility. 84 (66.7%) were deemed ineligible for various reasons including scoring above or below the required thresholds for the GAD-7 or PHQ-9, or not meeting the relevant STRAW criteria. Thus 42 (33.3%) participants were eligible to take part, of which 39 provided consent. Following this, one participant declined to be randomised. The study sample totalled 38 with a recruitment rate of 90.5%, exceeding the recruitment target.

Of the 38 participants randomised, 19 were allocated to CMT (Group 1=11, Group 2=8) and 19 were allocated to TAU. Seven participants did not complete the follow up outcome measures (CMT=2, TAU=5), thus there was an overall retention rate of 81.6% from recruitment to follow up data collection, exceeding the target set. Two of the seven participants were from the CMT group and dropped out of the trial due to physical illness (n=1) and difficulty committing time to the intervention (n=1). An additional TAU participant withdrew from the study due to disappointment with their randomisation outcome. The remaining four participants lost to follow up were from the TAU group.

ii. Willingness to be randomised

Of the 42 eligible participants, 38 (90.4%) were willing to be randomised. The achieved sample of 38 demonstrates randomisation to likely be acceptable. Whilst there was a higher attrition rate in the CMT group (n=2, 10.5%) compared to TAU (n=1, 5.3%), these numbers are very small and only the TAU participant withdrew specifically due to their randomised group allocation.

iii. Acceptability of the intervention

The mean number of sessions attended were 4.6 (out of 6), thus the attendance rate of 76% met the target. Attendance rates were as follows: nine (47.3%) participants completed all six sessions, two (10.5%) participants attended five sessions, four (21.1%) participants attended four sessions, one (5.3%) participant attended three sessions, one (5.3%) participant attended two sessions, and two (10.5%) participants attended one session before both withdrawing from the study. To note, 16 participants attended at least half of the sessions (84.2%). The intervention also had a high retention rate of 89.5%. One adverse event was reported during the trial as a participant in the CMT group became physically unwell during the intervention period. This was determined to be unrelated to the intervention content or delivery. No other adverse events or distress related to the intervention were reported by participants.

iv. Acceptability of outcome measures

Amongst the participants who completed the follow up measures, there was a 100% completion rate with no missing data, indicating the measures to be acceptable.

Quantitative outcome measures

Descriptive statistics are presented in Table 4. Due to the small sample size, statistical significance is not reported. Adjusted mean differences and Cohen's *d* effect sizes are presented. Deviations from normality were identified for the PHQ-9, and FCS Compassion from others, FSCSRS Inadequate self, SF-36 Physical function and SF-36 Role functioning/physical subscales. However, the robustness of ANCOVA allows it to handle such deviations. Table 5 summaries the statistical results of the ANCOVA analyses.

Table 4

Overall and between group means and standard deviations at baseline and post-intervention follow up for each outcome measure, unless otherwise specified

Outcome measures	Overall - Baseline M(SD)	Overall - Post M(SD)	CMT - Baseline M(SD)	CMT - Post M(SD)	TAU - Baseline M(SD)	TAU - Post M(SD)
MRQ - Identity¨	28.0(5.3)	27.2(5.6)	28.9(5.1)	27.5(6.0)	26.9(5.5)	26.9(5.2)
MRQ - Negative impact¨	16.1(2.5)	16.1(3.1)	16.2(2.1)	15.4(2.9)	15.9(3.1)	16.9(3.3)
MRQ - Relief¨	4.9(1.8)	5.3(1.7)	4.3(1.9)	5.2(1.9)	5.7(1.4)	5.6(1.5)
MRQ - New phase¨	2.8(1.7)	3.0(1.6)	2.1(1.4)	3.1(1.7)	3.6(1.8)	2.9(1.6)
MRQ – Time (short)¨	1.0(2.0)*	1.0(2.0)*	1.0(1.0)*	0.0(4.0)*	1.5(3.0)*	1.0(4.0)*
MRQ – Time (long)¨	5.6(0.9)	5.6(1.2)	5.8(1.1)	5.9(1.1)	5.4(0.6)	5.3(1.3)
MRQ - Control¨	6.9(2.9)	8.6(4.1)	7.0(2.8)	9.9(3.7)	6.8(3.2)	7.0(4.2)
GAD-7¨	8.0(4.0)*	4.0(5.0)*	8.0(5.0)*	3.0(3.0)*	9.0(6.0)*	7.5(5.0)*
PHQ-9¨	9.2(4.6)	6.4(4.7)	9.1(5.2)	5.0(5.3)	9.3(3.9)	8.2(3.4)
WHQ - Anxiety/Depression‡	18.2(3.9)	20.8(5.2)	17.8(3.7)	22.3(5.5)	18.7(4.3)	18.9(4.2)
WHQ - Wellbeing‡	10.4(2.2)	11.4(2.3)	10.3(2.1)	11.94(1.95)	10.6(2.4)	10.9(2.6)

WHQ - Somatic‡	11.0(4.0)*	14.0(3.0)*	11.0(4.0)*	14.0(2.0)*	12.0(13.0)*	12.5(5.0)*
WHQ - Memory‡	5.3(1.6)	6.8(2.5)	5.5(1.7)	7.94(2.38)	5.2(1.6)	5.5(2.0)
WHQ-Vasomotor‡	4.8(2.2)	5.6(2.2)	5.3(2.3)	6.35(1.80)	4.3(2.0)	4.6(2.2)
WHQ-Sleep‡	4.6(1.8)	5.1(1.8)	4.7(1.8)	5.65(1.80)	4.6(1.8)	4.5(1.6)
WHQ-Menstrual‡	9.0(6.0)*	10.0(5.0)*	7.5(3.0)*	8.0(4.0)*	11.5(7.0)*	11.0(6.0)*
SF-36 - Physical function‡	75.0(35.0)*	85.0(40.0)*	60.0(52.5)*	85.0(87.5)*	87.5(55.0)*	85.0(33.8)*
SF-36 – Role functioning/physical‡	53.2(40.7)	63.7(39.2)	38.2(33.2)	58.8(40.4)	71.4(42.6)	69.6(38.2)
SF-36 – Role functioning/emotional‡	33.3(66.7)*	33.3(66.7)*	33.3(66.7)*	100.0(83.3)*	33.3(75.0)*	16.7(75.0)*
SF-36 - Energy‡	27.1(18.0)	37.9(18.3)	24.1(15.7)	42.3(20.7)	30.7(20.5)	32.7(13.7)
SF-36 – Mental health‡	51.1(15.0)	56.9(21.1)	49.4(14.3)	61.6(23.5)	53.1(16.2)	51.1(17.6)
SF-36 – Social functioning‡	46.8(24.7)	60.5(29.1)	38.2(22.7)	58.8(33.0)	57.1(23.9)	62.5(24.5)
SF-36 – Bodily pain‡	55.0(25.0)*	67.0(35.0)*	55.0(22.5)*	67.5(42.)*	72.5(45.0)*	67.5(13.1)*
SF-36- General health‡	54.9(20.2)	47.6(22.9)	53.9(21.8)	42.9(23.7)	56.1(18.8)	53.2(21.3)
SF-36 - Health transition‡	42.7(22.5)	57.3(26.0)	42.6(26.2)	61.8(25.2)	42.9(18.2)	51.8(26.8)
FCS – From others¨	12.0(6.0)*	12.0(31.0)*	12.0(10.0)*	11.0(28.0)*	13.0(8.0)*	14.0(29.0)*

FCS – For others¨	14.0(11.0)*	11.0(47.0)*	12.0(12.0)*	9.0(9.0)*	15.0(11.0)*	16.0(40.0)*
FCS – For self¨	18.1(10.2)	9.0(50.0)*	17.2(9.4)	6.0(50.0)*	19.3(11.5)	13.0(41.0)*
FSCSRS - Inadequate self¨	18.6(6.8)	17.3(8.7)	18.5(6.8)	14.6(9.3)	18.8(7.0)	20.5(6.9)
FSCSRS - Reassured self┼	12.0(6.0)*	17.0(9.0)*	11.0(6.0)*	19.0(10.0)*	14.5(9.0)*	16.0(6.0)*
FSCSRS - Hated self¨	3.0(4.0)*	2.0(6.0)*	4.0(6.0)*	1.0(4.0)*	3.0(5.0)*	2.0(6.0)*

Notes: If data is non-normal at only one timepoint, median and IQR are reported across the measure or subscale for consistency. FCS= Fears of Compassion Scales, FSCRS= Forms of Self Criticizing/Attacking & Self-reassuring Scale, GAD-7= Generalized Anxiety Disorder 7-item scale, MRQ= Menopause Representations Questionnaire, PHQ-9= Patient Health Questionnaire-9, SF-36= 36-Item Short Form Survey, SF-36 Role functioning/physical = Role limitations due to physical health, SF-36 Role functioning/emotional = Role limitations due to emotional problems, WHQ= Women's Health Questionnaire

*= Median & IQR

┼= Higher scores indicate improvement

¨= Lower scores indicate improvement

Assumption testing also indicated that the MRQ Time (short) and SF-36 Role functioning/emotional subscales violated linearity. Attempts to correct this using log and square root transformations were unsuccessful, likely attributable to the study's small sample size or the characteristics of the measures. The WHQ Vasomotor subscale violated the homogeneity of regression slopes assumption. Given the exploratory nature of this study and making inferences about treatment efficacy were not intended, ANCOVA was still performed in these cases of assumption violation. Therefore, effect sizes should be interpreted with caution.

Table 5

Mean difference between CMT and TAU of post intervention scores with ANCOVA statistic and Cohen's d effect size

Outcome measures	Mean difference (95% CI)	ANCOVA statistic	Cohen's d effect size
MRQ - Identity¨	-1.23(-3.55, 1.09)*	*F*(1,28)=1.18	0.4
MRQ - Negative impact¨	-1.69(-3.72, .34)*	*F*(1,28)=2.91	0.62
MRQ - Relief¨	0.35(-0.85, 1.54)	*F*(1,28)=.36	0.23
MRQ - New phase¨	1.29(0.28, 2.30)	*F*(1,28)=6.88	1.05
MRQ – Time (short)¨	0.25(-0.86, 1.35)	*F*(1,28)=0.21	0.17
MRQ – Time (long)¨	0.04(-0.03, 0.11)°	*F*(1,28)=1.49**	0.44
MRQ - Control¨	2.77(0.48, 5.06)	*F*(1,28)=6.12	0.89
GAD-7¨	-2.17(-5.23, 0.89)*	*F*(1,28)=2.11	0.53
PHQ-9¨	-3.161(-6.38, 0.06)*	*F*(1,28)=4.04	0.73
WHQ - Anxiety/Depression‡	4.24(1.41, 7.07)*	*F*(1,28)=9.44	1.12
WHQ - Wellbeing‡	1.18(-0.34, 2.70)*	*F*(1,28)=2.52	0.57
WHQ - Somatic‡	2.13(.26, 3.99)*	*F*(1,28)=5.47	0.86
WHQ - Memory‡	2.20(.97, 3.43)*	*F*(1,28)=13.52	1.33

WHQ-Vasomotor‡	1.10(-0.11, 2.10)*	*F*(1,28)=8.56***	0.69
WHQ-Sleep‡	1.06(0.09, 2.04)*	*F*(1,28)=5.01	0.81
WHQ-Menstrual‡	0.32(-1.70, 2.35)*	*F*(1,28)=0.12	0.17
SF-36 - Physical function‡	8.97(-2.34, 20.27)*	*F*(1,28)=2.64	0.64
SF-36 – Role functioning/physical‡	11.53(-13.43, 36.38)*	*F*(1,28)=0.90	0.38
SF-36 – Role functioning/emotional‡	30.85(0.52, 61.19)*	*F*(1,28)=4.34	0.76
SF-36 - Energy‡	9.79(6.97, 13.40)*°	*F*(1,28)=0.99**	0.37
SF-36 – Mental health‡	9.01(7.79, 10.05)*°	*F*(1,28)=3.06**	0.32
SF36 – Social functioning‡	13.33(-3.63, 30.30)*	*F*(1,28)=2.59	0.63
SF-36 – Bodily pain‡	5.65(-8.70, 19.99)*	*F*(1,28)= 0.65	0.32
SF-36- General health‡	4.45(-6.75, 15.65)*	*F*(1,28)=0.66	0.30
SF-36 - Health transition‡	-2.06(-16.32, 12.20)	*F*(1,28)=0.09	0.11
FCS – From others¨	-4.36(-8.42, -0.31)*	*F*(1,28)=4.86	0.80
FCS – For others¨	-4.81(-8.64, -0.99)*	*F*(1,28)=6.64	0.94
FCS – For self¨	-3.87(-12.88, 5.51)*	*F*(1,28)=0 .77	0.32
FSCSRS - Inadequate self	-5.69(-11.05, -0.34)*	*F*(1,28)=4.74	0.79
FSCSRS - Reassured self	5.49(1.73, 9.25)*	*F*(1,28)=8.93	1.17
FSCSRS - Hated self	-2.12(-5.08, 0.84)*	*F*(1,28)=2.15	0.56

Notes: Mean differences reported as CMT vs. TAU; FCS= Fears of Compassion Scales, FSCRS= Forms of Self Criticizing/Attacking & Self-reassuring Scale, GAD-7= Generalized Anxiety Disorder 7-item scale, MRQ= Menopause Representations Questionnaire, PHQ-9= Patient Health Questionnaire-9, SF-36= 36-Item Short Form Survey, SF-36 Role functioning/physical = Role limitations due to physical health, SF-36 Role functioning/emotional = Role limitations due to emotional problems, WHQ= Women's Health Questionnaire

*= mean difference is in desired direction

**= log-transformed data

***= interaction model reported

°= back-transformed data

⨦= Higher scores indicate improvement

¨=Lower scores indicate improvement

i. Menopause Representations Questionnaire (MRQ)

Compared with the TAU group, the CMT group showed slightly lower, therefore improved, scores on the MRQ Identity (mean difference: -1.23, 95% CI [=-3.55, 1.09]) and Negative impact (mean difference: -1.69, 95% CI [-3.72, 0.34]) subscales, adjusting for baseline, with small to medium effect sizes observed (*d*=0.40 and 0.62, respectively). Scores on the New phase (mean difference: -1.29, 95% CI [=-2.30, 0.28]) and Control (mean difference: -2.77, 95% CI [-5.06,-0.48]) subscales were lower for TAU compared to CMT when adjusting for baseline scores, with large effect sizes (*d*=1.05 and 0.89, respectively). No notable group differences were observed for the Relief (mean difference: 0.35, 95% CI [=-0.85, 1.54], *d*=0.23), Time (short) (mean difference: 0.25, 95% CI [-0.86, 1.35], *d*=0.17) and log-transformed Time (long) (mean difference: 0.04, 95% CI [-0.03, 0.11], *d*=0.44) subscales, with effect sizes ranging from very small to small in favour of CMT.

ii. GAD-7

Lower GAD-7 scores indicated more improvement for CMT participants compared to TAU participants at post-intervention (mean difference: -2.17, 95% CI [-5.23, 0.89], with a moderate effect size (*d*=0.53).

iii. PHQ-9

Due to a violation of the linearity assumption, PHQ-9 scores were transformed prior to analysis to improve model fit. The ANCOVA revealed that when adjusting for baseline scores, CMT participants had lower (more symptom improvement) log-transformed PHQ-9 scores at post-intervention, compared to TAU, with a medium effect size (mean difference: -3.16, 95% CI [-6.38, 0.06], *d*=0.73).

iv. Women's Health Questionnaire (WHQ)

Except for the Menstrual subscale, all other subscales demonstrated scores in the desired direction of higher scores for the CMT group. Large effect sizes were found for the Anxiety/Depression (mean difference: 4.24, 95% CI [1.41, 7.07], *d*=1.12), Somatic (mean difference: 2.13, 95% CI [0.26, 3.99], *d*=0.86), Memory (mean difference: 2.20, 95% CI [0.98, 3.43], *d*=1.33) and Sleep (mean difference: 1.06, 95% CI [0.09, 2.04], *d*=0.81) subscales. Moderate effect sizes were found for the Wellbeing (mean difference: 1.18, 95% CI [-0.34, 2.70], *d*=0.57) and Vasomotor (mean difference: 1.00, 95% CI [-0.11, 2.10], *d*=0.69) subscales.

v. 36-Item Short Form Survey (SF-36)

Almost all subscales of the SF-36 demonstrated higher scores, and therefore better health status, for the CMT group compared to TAU, when adjusting for baseline scores. A moderate effect size was found for the Physical function (mean difference: 8.97, 95% CI [-2.34, 20.27], *d*=0.64), Role functioning/emotional (mean difference: 30.85, 95% CI [0.52, 61.19], *d*=0.76), and Social functioning (mean difference: 13.33, 95% CI [-3.63, 30.30], *d*=0.63) subscales. A small effect size was found for the Role functioning/physical (mean difference: 11.53, 95% CI [-13.43, 36.38], *d*=0.38), log-transformed Energy (mean difference: 9.80, 95% CI [6.97, 13.40], *d*=0.37), log-transformed Mental health (mean difference: 9.01, 95% CI [7.79, 10.05], *d*=0.32), Bodily pain (mean difference: 5.65, 95% CI [-8.70, 19.99], *d*=0.32) and General health (mean difference: 4.45, 95% CI [-6.75, 15.65], *d*=0.30) subscales. The Health transition subscale revealed a slightly higher score for TAU compared to CMT (mean difference: 2.06, 95% CI [-12.20, 16.32], *d*=0.11).

vi. Fears of Compassion (FCS)

Across all FCS subscales, the CMT group was found to have lower scores than TAU at follow up, indicating less fears of compassion. A large effect size was observed for the Compassion from others (mean difference: -4.36, 95% CI [-8.42, -.31], *d*=0.80) and Compassion for others subscales (mean difference: -4.81, 95% CI [-8.64, -0.99], *d*=0.94]). The Compassion for self subscale revealed a small effect size (mean difference: -3.87, 95% CI [-12.88, 5.13], *d*=0.32).

vii. Forms of Self Criticising, Attacking and Reassuring (FSCRS)

ANCOVA analyses revealed the scores of the CMT group to be lower for the Inadequate self (mean difference: -5.69, 95% CI [-11.05, -.34], *d*=0.79) and Hated self (mean difference: -2.12, 95% CI [-5.08, 0.84], *d*=0.56) subscales, which are in the desired direction, with moderate to large effect sizes. Higher scores for the CMT group compared to TAU, with a large effect size, were found for the Reassured self (mean difference: 5.49, 95% CI [1.73, 9.25], *d*=1.17) subscale, indicating greater self-reassurance.

Discussion

Key findings

The purpose of this study was to investigate the feasibility and acceptability, in addition to exploring preliminary trends, of an online group-based CMT intervention for peri and early postmenopausal women. The high willingness to be randomised (90.4%) and sample size indicates recruitment and randomisation to be feasible and acceptable. Overall retention in the study exceeded the aim of ≥75%. Attrition was low (Pearson et al., 2020), largely explained by external factors rather than the study itself, demonstrating the acceptability of the trial. Of those who completed the follow up measures, they appeared to be well tolerated and acceptable, with a 100% completion rate. The intervention also demonstrated high acceptability, evidence by a strong retention rate of 89.5%. Most participants attended at least half of the intervention sessions, suggesting engagement, though a minimum dose has not been defined in the context of a six-session CMT intervention. Overall, the study provided promising evidence for the feasibility and acceptability of the intervention, study design and outcome measures. Therefore, group-based CMT for women experiencing the menopause transition could be evaluated in larger trials.

Potential trends in the clinical outcomes, associated with the CMT intervention, were found. Compared to TAU, participants in the CMT group exhibited improvements in menopausal symptoms, symptoms of anxiety and depression, and health-related QoL. Specifically, large effects were found for improvements in experiences of anxiety and low mood, somatic symptoms, and sleep problems, giving and receiving compassion, self-compassion and self-to-self relating.

Interpretation of findings

The current study demonstrated more favourable retention and lower attrition rates compared to a previous pilot study investigating a self-directed CFT intervention for the menopause transition. Pickup (2022) reported an overall attrition rate of 65.5%, of which the largest proportion of dropouts occurred during the intervention phase (Pickup, 2022). One possible explanation for this difference is the group structure of the current intervention, which provided opportunities for peer support, sharing and validation of experiences, and facilitator-led sessions, thus fostering accountability and engagement. Additionally, Pickup (2022) noted depression as a reason for dropout, suggesting that low motivation may have contributed to attrition. In the present study, the mean baseline PHQ-9 score for the CMT group was 9.12, indicating mild to moderate depressive symptoms, with anhedonia reported as a common feature. Given that anhedonia can diminish motivation (Cooper et al., 2019), it is possible that the structured, socially supportive nature of the group format helped buffer against this effect, therefore protecting against dropout.

Although session attendance suggests that the intervention was acceptable, attendance rates were somewhat lower than those reported by Conklin et al (2020) for a manualised cognitive behavioural group therapy intervention for a similar sample. Whilst not all participants provided reasons for unattendance, those who did cited competing demands such as childcare responsibilities and annual leave. As the study took place during the summer months, it may have made these barriers to attending more pronounced. Technological difficulties including unstable internet connections and difficulties joining breakout rooms further hindered attendance as this caused some participants to leave sessions early or they were unable to attend a session at all.

Breaks between sessions four and five, and five and six, may have influenced outcomes. Whilst it is possible that these breaks may have disrupted the momentum of the intervention and reduced continuity in group processes, they may have also conferred certain benefits. Research on therapy spacing suggests that less frequent sessions can provide valuable opportunities for reflection, consolidating learning, and applying skills that have been learnt, potentially enhancing engagement with

therapeutic material (Lin et al., 2023). Therefore, the breaks may have offered additional time for participants to practise and embed the CMT skills.

Notably, large effect sizes were observed for two subscales of the FCS; Compassion for others and Compassion from others. Thus, participants seemed to have become more open to giving and receiving compassion following the intervention. This finding is particularly relevant given the evidence that the relationship between self-criticism and depression is moderated by compassion from others. More specifically, depressive symptoms are strongly linked to a higher fear of receiving compassion (Hermanto et al., 2016). The observed reductions in fears of compassion may represent a key mechanism of CMT for addressing self-critical biases, which are a known vulnerability factor for psychological distress for menopausal women (Gilbert, 2014). Reductions in distress were observed across the Anxiety/Depression (WHQ), Wellbeing (WHQ) and Emotional (SF-36) subscales, and PHQ-9 and GAD-7, suggesting that the changes may have contributed to broader improvements in psychological wellbeing. There is potential for future research to explore fears of compassion as a target focus for interventions addressing menopause-related distress.

The preliminary trends observed in the current study highlight the potential value of CMT as a treatment for menopausal women. Whilst exploratory, the findings build upon a growing body of literature supporting the use of psychosocial interventions in this population. A recent meta-analysis demonstrated the benefits of cognitive behavioural and mindfulness-based treatments for improving psychological symptoms and QoL during menopause (Spector et al., 2024). There is scope for compassion-based interventions to contribute meaningfully to the evidence base for psychological interventions for menopause-related difficulties, by offering a complementary approach focussing more specifically on reducing self-criticism and fostering emotional resilience.

Small to moderate effect sizes were observed across the SF-36 subscales. Whilst this suggests some change occurred, this measure may not be the most sensitive tool for capturing changes to health-related QoL in the context of menopause. The wide confidence intervals crossing the null also query the

appropriateness and ability of the SF-36 for detecting meaningful change. This could be due to the various subscales having floor and ceiling effects, therefore limiting the capacity of the measure to detect changes (Brazier et al., 1996; Cepeda-Valery et al., 2011; Jenkinson et al., 1996; Lai et al., 2003).

The lack of preliminary trends for the CMT intervention on some of the MRQ subscales is not dissimilar to research by Conklin and colleagues (2020) who investigated manualised group CBT for peri and postmenopausal women experiencing vasomotor symptoms and mood disorders. As the MRQ assesses cognitive representations of menopause (Hunter & O'Dea, 2010), such beliefs may be entrenched or rigid from prolonged exposure to negative social narratives (de Salis et al., 2017; Richard-Davis et al., 2022) As the previous and current studies used a post-intervention follow up only, this was likely not to be sufficient enough time to capture shifts in beliefs (Scheffer et al., 2022), thus longer follow-ups may be needed to establish this. As compassion-based interventions do not prioritise modifying beliefs and cognitive interpretations (Gilbert, 2014), the MRQ may therefore be measuring constructs that are not addressed by CMT.

Although information on HRT, contraception and psychiatric medication use was collected as part of the demographic data, these variables were not analysed as potential covariates or mediators. Given the feasibility focus and small sample size, the study was not powered to investigate efficacy or mechanisms of change. Thus, adjusting for these variables would have extended beyond the scope of the study and risked overinterpreting preliminary trends. Nonetheless, these factors are clinically relevant and may have influenced the outcomes observed. For example, HRT improves menopausal symptoms and may influence mood (Borozan et al., 2024; Khan et al., 2023; Zhang et al., 2023), possibly amplifying or overshadowing the benefits of CMT. Similarly, psychiatric medication use could have contributed to reductions in anxiety or depressive symptoms (Cipriani et al., 2018; Lewis et al., 2019), independent of the intervention, whilst also affecting motivation and engagement with the practices. Contraceptive use, particularly hormonal methods, is associated with changes in mood and menstrual-related symptoms (Jahanfar et al., 2024; Robakis et al., 2019), which may have influenced participants experience of menopause and their responses to the intervention. For these reasons, the findings

should be interpreted with caution, as medication use may have contributed to some of the changes observed.

Strengths and limitations

A strength of this study is that to the best of the authors' knowledge, it is the first to investigate an online, group-based CMT intervention for women experiencing early peri to early postmenopause. The digital delivery of the intervention supports the proposed shift towards implementing digitised healthcare in the NHS (Honeyman et al., 2016). In the context of psychological therapies, this can help improve accessibility and cost-effectiveness. The benefits of more intensive interventions to address fears of compassion have been recommended (Lennard et al., 2021) thus the intervention design offers more people the opportunity to receive a higher intensity intervention with potential cost savings. Another strength of the study is the PPI contributions for shaping both the intervention and wider study design. Such co-production ensured that the intervention was acceptable, relevant and responsive to the needs of the target population.

The current sample was predominantly White-British which may limit the generalisability of the findings. Evidence suggests that cultural differences in attitudes, perceptions and experiences of menopause exist (Kowalcek et al., 2005; Hall et al., 2007) with some cultures perceiving it as a positive life stage whilst others associate it with loss and decline (Ayers et al., 2010). This could therefore present differences in engagement with a CMT intervention, in addition to baseline levels of wellbeing, self-criticism and openness to developing self-compassion. Participants were asked to indicate their availability for the intervention groups' dates and times, prior to randomisation. This was necessary to ensure that those allocated to the CMT group could attend the scheduled sessions. However, this may have influenced how participants approached the study, for example by increasing a sense of commitment to the CMT group even before allocation, which may have shaped motivation or disappointment depending on group assignment. Whilst randomisation was conducted independently, and the procedure was framed around scheduling rather than treatment choice, this should have minimised influence, though should be held in mind when interpreting retention and engagement outcomes for both the intervention and overall trial.

A further limitation relates to the exclusion of participants with severe anxiety and/or depression. Though this decision was appropriate for a feasibility trial, it limits the generalisability of the findings to women experience more severe symptoms. As such, the current study offers limited insight into whether the CMT intervention would be acceptable for those with higher clinical needs. Furthermore, fidelity to the intervention was not assessed thus conclusions cannot be drawn about the extent to which the CMT intervention was delivered as intended. It therefore remains unclear as to whether variations to delivery could have influenced participant outcomes, in addition to there being limited insight into whether modifications to the intervention are necessary for future trials. Monitoring of adverse events relied on participant self-report. Whilst no adverse events were reported, self-report may have limited identification and recognition of difficulties or problems as adverse. Therefore, this may have underestimated the occurrence of adverse events in the trial.

Another important limitation of the current study is the lack of blinding. Given the nature of the intervention, participants needed to be aware of their group allocation thus blinding of participants was not possible. Due to the structure of the research team, blinding of assessors was also not possible as the researchers who delivered the intervention were also responsible for collecting and analysing trial data. This dual role introduces potential bias to the study as the assessment and interpretation of the data could have been influenced by researcher knowledge of participant allocation (Bhatia et al., 2022; Monaghan et al., 2021). Finally, though detecting statistically significant effects was not an aim of the current study, findings should still be interpreted with caution given the small sample size. It is possible that the preliminary trends observed could have been due to chance which highlights the need for larger sample sizes in future studies so that it is sufficiently powered for conclusions to be drawn.

Implications for future research

It is clear from the present findings that the study design, intervention and outcomes are feasible and acceptable. Therefore, there is scope for a definitive RCT to be conducted. Important data has been gathered to inform the design of a fully powered trial to assess the effectiveness of group-based online CMT, which may

offer an effective intervention with a long-term impact for many women going through menopause.

A larger sample size is needed to increase the statistical power of the study, which would allow for more robust conclusions about the efficacy of group-based online CMT to be drawn. A well-powered RCT would also allow for subgroup analyses to be conducted to better understand differences in who the intervention may benefit (Barraclough & Govindan, 2010). Further to this, a larger sample size may also help address the attendance rates of the current study. Whilst competing demands at certain times of the year may still affect some participants, a larger and more diverse sample could increase the chance of these factors being distributed more evenly, reducing their overall impact on session attendance rates. Nonetheless, careful consideration to the timing of the intervention delivery is also necessary in future trials to maximise participant engagement and attendance.

Including a follow up beyond post-intervention would enable the assessment of maintained benefits, as well as whether changes emerge over a longer timeframe. Delayed effects of the intervention may only become apparent after participants have had the opportunity to consolidate their learning and apply the new skills they have acquired to their daily life.

Future trials should consider how group-based CMT could be evaluated across a wider spectrum of psychological symptom severity. This may require adaptations such as enhanced clinical monitoring, or integration with specialist services to ensure safety. Investigating the intervention with more severe presentations would extend the evidence base, improve understanding of subgroup differences in response to the intervention and help determine whether CMT can be scaled to meet the needs of women across the full range of psychological experiences during menopause.

The potential influence of medication use, such as HRT, contraception and psychiatric drugs, should be accounted for in future trials. Collecting detailed information and analysing these variables within an ANCOVA model, would strengthen the interpretability of outcomes and provide greater clarity on the true

contribution of CMT. It would also help determine whether responses to the intervention differ, depending on concurrent treatments.

The outcome measures were found to be acceptable though there is scope to reconsider the SF-36. Replacing the SF-36 with a more relevant measure, such as the Menopause-Specific Quality of Life Questionnaire (Hilditch et al., 1996) may be more sensitive to detecting changes to psychological and physical wellbeing for menopausal women.

A future trial should evaluate fidelity through both self-reported and independent observer ratings, using sessions recordings, adherence checklists and supervision logs, to ensure consistency across groups. Thus, fidelity should not only monitor adherence to the protocol but also the quality of intervention delivery and the extent to which participants are actively engaged in the session and practices. There were instances in the current study where session structure was adapted in response to time constraints. These adjustments were responses to the group needs and the realities of online delivery, such as allowing more time for discussion when participants wanted to share experiences or moving an exercise to the following session so the session could finish on time following delays due to technical disruptions. Thus, some adaptation and flexibility is necessary as it can validate participants' experiences and make the sessions and content more manageable and meaningful. However, such changes also reflected deviations to the planned protocol which can make it difficult to know whether outcomes were the result of the intervention as planned, or of facilitator-led modifications. Formal fidelity measuring would enable such adaptations to be systematically documented. This would not only help strengthen interpretation of outcomes but also support intervention refinement by identifying which adaptations enhance or risk diluting the intervention. Furthermore, formalised procedures for monitoring and documenting adverse events should also be implemented to ensure systematic safety reporting such as standardised adverse event reporting forms, routine check-ins or independent monitoring processes. Interpreting fidelity data alongside adverse events could help clarify how participants responded to the intervention and any changes. This would provide a more comprehensive and reliable account of both intervention quality and participant safety in a future RCT.

Incorporating a cost-effectiveness analysis in a full trial would be valuable (Pearson et al., 2020; Jamison, 2009). Assessing both intervention delivery costs and broader health and social costs would offer a more comprehensive understanding of the value of the intervention. This would support informed decision making regarding the implementation and scalability of CMT into routine clinical practice.

Implications for clinical practice

Increasing strains are being placed on the NHS whereby the growing demand for services, particularly within mental health, is greater than what the workforce and resources can respond to (House of Commons, 2023). A group-based intervention that can be delivered online and is time-limited helps to address this issue and is in keeping with the NHS Long Term Plan (NHS England, 2019).

In the current study, group numbers per session varied in size due to non-attendance. Sessions that had smaller groups of 5-6 participants allowed for more in-depth discussions and reflections, which are important components of the intervention and may contribute meaningfully to its therapeutic impact. The smaller groups also improved the pacing of the sessions, giving more space to share and engage with the content. In contrast, sessions with a larger number of attendees also had strong engagement with several participants eager to contribute. This made it challenging to cover all the planned content within the 90-minute session time, leading to material being carried over to the follow session or limited time for reflections. Group size should be carefully considered when planning the wider implementation of group-based CMT to strike a balance between fostering discussions and maintain a manageable session structure.

Participant engagement was impacted at times by the functionality of Microsoft Teams, particularly around the use of breakout rooms. These technical constraints highlight the potential value of exploring alternative video conference platforms, such as Zoom, or extending the delivery to in-person formats where feasible.

Conclusion

This study provides evidence for the feasibility and acceptability of a six-session group-based CMT intervention delivered online for women experiencing the MT and early postmenopause. Feasibility was supported by positive recruitment, retention, attendance and outcome measure completion rates. Taken together with the encouraging preliminary trends in clinical outcome measures observed, these findings support the rationale for a future RCT to robustly evaluate the intervention's effectiveness.

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Part 3 – Critical appraisal

Overview

This critical appraisal considers what informed my choice to pursue menopause as the topic of my thesis, and more specifically, physical activity and compassion-based interventions for my literature review and empirical paper. I have also provided a reflective and critical commentary on the issue of heterogeneity within the review, exploring how my understanding of its implications has evolved over time. Finally, I discuss key reflections and personal learnings from co-facilitating the Compassionate Mind Training (CMT) intervention and conducting the empirical research.

The big 'why'?

When deciding on a thesis topic, I wanted it to be something I was personally interested in and that aligned with my broader clinical and academic interests. Given my research and clinical experience in psychosis pre-training, I initially expected to continue my focus in this area. None of the available psychosis-related projects interested me and in many ways I am glad they did not as it encouraged me to step outside my comfort zone and explore a different area of interest, that felt less familiar. This has been important for allowing me to grow professionally.

I was first introduced to Compassion Focussed Therapy (CFT) whilst working in a psychosis team as an assistant psychologist. After attending a talk by Deborah Lee, I left feeling inspired and began reading more about CFT, drawn in by its focus on the inner critic, shame, and self-compassion (Gilbert, 2014). These concepts resonated with me both personally and professionally. In my work with psychosis clients, I was struck by how pervasive self-criticism was. It often related to things they had done whilst unwell, feelings of shame around having psychosis, or the distressing content of auditory hallucinations. This seemed to impact their sense of self and hinder recovery. I came to see how central self-to-self relating was to their recovery journey. This pattern became even more apparent during my first year placement in an eating disorder service. Almost all formulations featured self-criticism, linked to various feelings including unworthiness, perfectionism, and

shame. Seeing this operate in two distinct client groups emphasised for me how transdiagnostic self-criticism is, contributing to both the development and maintenance of distress (Kelly & Carter, 2013; Löw et al., 2020; Waite et al., 2015). It reinforced my interest in CFT as an approach to these precipitating and perpetuating processes (Gilbert, 2005).

However, I also believe it to be simplistic and reductive to consider self-criticism only within the context of diagnosable mental health conditions. It is a common experience in the general population and can affect wellbeing even in the absence of a formal diagnosis. Yet, research on self-criticism in non-clinical groups is limited (Tibubos et al., 2022). Given compassion-based approaches are known to effectively address self-criticism and shame (Leaviss & Uttley, 2014; Vilda & Soldevilla, 2022), I was keen to explore how it might be applied to groups who may not access mental health services but still experience psychological distress.

When the opportunity to do research in the menopause field presented itself, it seemed like the perfect fit. I have long had a personal interest in women's health and hormonal health, stemming from my own experiences with hormonal difficulties. I have also witnessed, through my mother, how menopause can be physically and emotionally disruptive yet receives little recognition. Whilst menopause is not a taboo topic, I am constantly surprised by the lack of dialogue and attention around it. Therefore, choosing menopause as my thesis topic focus felt purposeful, allowing me to contribute to the gaps in psychological understanding, support, and research.

Another reason I was drawn to this research was the opportunity to deliver the intervention myself. One of my main motivations for pursuing clinical psychology was the privilege of working directly with clients. I find the therapeutic relationship to be one of the most meaningful and rewarding aspects of the role. Being able to co-facilitate a group-based intervention not only aligned with my professional interests but also gave me valuable hands-on experience applying theory to practice.

When refining the focus of my literature review, I felt stuck. Exploring psychosocial interventions seemed like the most obvious direction to take. However, a recent comprehensive review on psychosocial interventions for menopause

(Spector et al., 2024) had already made a significant contribution to the field. As I began reading more widely around interventions for menopause, I became increasingly intrigued by the literature on lifestyle approaches, particularly physical activity. These interventions struck me as especially important given their accessibility and cost-effectiveness (Amiri et al., 2024). They seemed to hold real potential for supporting women through menopause in a scalable way (Sternfeld & Dugan, 2011). This also felt personally relevant. As someone who is experiences the mental and physical benefits of exercise, I was interested in understanding its utility in menopause. It also connected to my Master's dissertation on aerobic exercise for people with severe mental illness, making this a full-circle moment. This integration of personal passion, clinical relevance and academic continuity has made the research feel authentic and grounded.

Heterogeneity in intervention research: helpful or hinderance?

Previous meta-analyses examining physical activity for peri and postmenopausal women often included studies with broad age ranges, poorly defined menopausal staging, or combined physical activity with other interventions such as education or cognitive behaviour therapy. Whilst this may increase the number of eligible studies, it also introduces considerable conceptual and clinical variation. Unsurprisingly, these reviews tend to report high levels of heterogeneity, a known challenge when synthesising evidence across behavioural interventions (Higgins et al., 2019). Therefore, a key motivation for my review was to address this with more stringent inclusion criteria. I hoped this would enhance conceptual clarity and produce clinically meaningful findings.

Despite these efforts, heterogeneity remained substantial in my review. From a meta-analytic perspective, high heterogeneity suggests that variability in outcomes is not solely due to chance but also reflects real differences between studies, such as in participant characteristics, intervention design or methodology (Higgins & Thompson, 2002; Melsen et al., 2014). This complicates interpretation and limits the strength of the conclusions that can be drawn. Initially, I found this frustrating. However, as I engaged more deeply with the meta-analytic process, my understand of heterogeneity began to shift.

In psychosocial and behavioural intervention research, heterogeneity is not only common but essentially inevitable and expected. As Cuijpers et al. (2020) and Conn et al. (2011) argue, variation often reflects adaptions for different populations, contexts, and resources. Rather than being a methodological flaw, it can reflect real-world relevance and applicability (Lorenc et al., 2016; Petticrew & Roberts, 2006). This was evident in the studies included in my review. The same physical activity types, such as yoga, varied in structure, dose and delivery format. Similarly, non-physiological symptoms of menopause were assessed using a wide range of measures, with several studies using the 36-Item Short Form Survey or Menopause Rating Scale, whilst only one or two studies used measures such as the Brief Mood Introspection Scale and Satisfaction with Life Scale. These differences also contributed to the heterogeneity observed.

Linden and Hönekopp (2021) suggest that this kind of variability may indicate deeper theoretical issues about what is being measured, and how. In my review, the inconsistent use of psychological outcome measures may reflect a broader lack of consensus on how psychological wellbeing is conceptualised in menopause research. Atkinson et al. (2018) also suggested that a certain degree of variability may stem from inconsistencies in implementation, measurement error or other trial related noise, rather than differences in intervention effectiveness. These perspectives helped me to view heterogeneity as less of a problem to be solved, and more as a source of insight into the complexity of intervention research.

I have come to understand that the implications of heterogeneity may depend on the aim of a review (Loren et al., 2016). If the goal is to identify which specific physical activity intervention protocol is most effective, then high heterogeneity can obscure findings and limit confidence in recommendations (Higgins et al., 2003; Melsen et al., 2014). However, if the goal is to assess whether physical activity has general psychological benefits during menopause, regardless of delivery format, then heterogeneity can be informative. Perhaps it is more of a feature than a flaw. Despite heterogeneity in my review, improvements were observed. This suggests that physical activity may be a flexible and effective intervention for supporting

women during menopause, a group that is inherently diverse. For this reason, adaptability may not only be appropriate, but essential.

That said, flexibility does not negate the need for rigour. The findings of the review reinforced the need for improved consistency in reporting and study design. Without clear intervention protocols and standardised tools, identifying mechanisms of change, or assessing dose-response relationships, is difficult. Crocker et al. (2022) highlighted this issue in their review of physical activity interventions, arguing for the development of core outcome sets to help standardise the field to facilitate more consistent reporting across studies. My experience doing the review supports this notion, whereby greater transparency and consistency would have enhanced both the quality of the evidence base and the insights available from the meta-analysis.

Reflecting on the overall process, my own perspective on heterogeneity has evolved and changed. Where I once saw it as something that was limiting, thus should be avoided, I now see it as something that reflects the complexity and diversity inherent in real-world intervention delivery. In a population as heterogeneous as menopausal women, variation may be essential to capture the full picture of what works. Therefore, heterogeneity can help researchers not simply to ask *does it work?* but rather *what works, for whom and under what conditions?*

Looking forward, I believe future research must aim to strike a balance between standardisation, and real-world flexibility. Transparent reporting of key elements, such as intervention dose, adherence, deviations and protocols, alongside consistent use of validated measures, will improve the quality and comparability of future research. Though at the same time, embracing some level of variation is important if we are to understand how interventions perform in real-world contexts. The most useful reviews may not be those that produce the ‘cleanest’ data, but those that reflect the ‘messiness’ and richness of applied practice.

Reflections and learnings

One of the most valuable aspects of the empirical research was co-facilitating the CMT intervention with my research partner and fellow trainee Clinical

Psychologist, Kate. As someone who is drawn to clinical work, this felt both purposeful and exciting, and felt like a valuable contribution to my developing identity as a scientist-practitioner. That said, it also came with challenges that prompted important learning.

I anticipated that there would be a lot of interest in the study given how widely relevant the topic of menopause is for a proportion of the public, and that many experience symptoms that impact their quality of life and wellbeing. Enthusiasm and positive feedback from my mother, her peers and the focus groups participants, reinforced the timeliness and importance of the research topic and intervention. I was therefore surprised by the initial slow pace of recruitment. This may have been due to the recruitment materials being primarily circulated through informal channels at first, such as personal social media accounts and word of mouth. However, in retrospect, the slow uptake likely also reflected broader challenges around help-seeking among menopausal women. Many women delay seeking and accessing support due to embarrassment, fear of judgement, or the belief that menopause is simply something to 'get on with', rather than an experience that warrants psychological intervention or attention (Barber & Charles, 2023). Once the study was shared on official channels with greater reach and credibility in the menopause field, such as the Menopause Matters forum and the Menopausing and Me Facebook page, recruitment improved. This has left me reflecting on the necessity of endorsement from trusted sources in helping menopausal women feel legitimised and 'worthy' of seeking support, and appropriate participants for research.

Despite the improvement in recruitment, it is important to reflect on who engaged with the intervention. As reported in my empirical paper, over 90% of participants identified as White. Whilst this does not necessarily reflect initial interest, it points to disparities in uptake. One possible explanation is that barriers to help seeking may be particularly pronounced for women from the global majority. As MacLellan et al. (2023) highlight, barriers to accessing menopause support may be greater for women from the global majority due to cultural stigma, mistrust in medical professionals, or limited awareness of psychological symptoms. Thus, a group-based intervention for psychological wellbeing may have seemed unfamiliar or inaccessible for some. I have therefore been reflecting on how future interventions

might more actively engage and include women from underrepresented communities, not only in the design and delivery but also in how they are communicated and disseminated.

I thoroughly enjoyed delivering the CMT intervention. Though I did have some concerns about how participants would respond to Kate and me, given that we were younger and had not experienced menopause ourselves, and wondered whether this would impact engagement or trust. However, I did not experience this at all. Rather, I was impressed by the engagement of participants and the rapport that formed.

Managing group dynamics can be challenging at the best of times, something Kate and I discussed in preparation for the intervention starting, especially as the group was taking place online. Online therapy groups are known to pose practical and relational challenges (Weinberg, 2021) so we were mindful of how this might affect engagement, group cohesion and the overall group process. There is thought to be more emotional disconnect and a reduced sense of presence when groups are delivered remotely, making it harder to build trust and attune to the subtleties of group dynamics (Andrews et al., 2024). This felt especially important for us to keep in mind and consider how to manage, given the inclusion of group discussions and tasks, and reflective components in the intervention.

Whilst anticipating that some of these challenges would arise, for the most part they did not! Instead, I experienced the group as engaged, connected and respectful of one another's boundaries throughout the intervention. I believe this was helped by establishing shared ground rules and setting clear expectations around participation and confidentiality, which seemed to create a safe and contained space from the outset.

Naturally, some participants were more vocal and open from the beginning, whilst others were quieter and appeared to engage more through internal reflection. I was particularly moved when quieter group members chose to share as I felt it reflected a sense of safety and trust in the group. As someone who tends to be a more vocal group participant, I had previously equated engagement with active contributions. However, this has challenged that assumption. My perspective on

what group engagement can look like was broadened to appreciate the need for space so participants can connect with the intervention content in their own way and at their own pace. This learning has stayed with me, and I hope to carry it forward as I move into qualified clinical roles.

Another challenge encountered concerned pacing due to the amount of content in certain sessions. For example, session two was rich with content, introducing both the 'tricky brain' concept and the three systems model. These prompted thoughtful reflections and interesting questions. It felt important to allow space for these conversations but as a result, the remainder of the 90-minute session felt rushed to fit in the rest of the content. On two occasions, we decided to carry material over to the next session to allow for the discussions. Though minor deviations, as mentioned in my empirical paper, they do raise questions about protocol fidelity. However, Galuchie et al. (2021) argue that not all deviations are problematic, particularly in early-stage or feasibility research, where flexibility is necessary to a certain extent. In fact, they offer valuable insight into the feasibility and practicalities of intervention delivery. Considering this, I therefore view the deviations in the empirical research as less of a problem, and more as an indicator about how the structure and content of the intervention could be improved for future use. This reinforces for me the importance of balancing fidelity to a manualised protocol, with responsiveness to the needs and dynamics of a group or individual client, something that is an important consideration for both research and clinical practice.

Conclusion

Completing this thesis has been one of my proudest and most rewarding moments. I feel fortunate to have found the process both enriching and genuinely enjoyable. From conducting a systematic review to co-facilitating a group-based intervention, I have gained a much deeper understanding of the complexities involved in designing, delivering and evaluating interventions for psychological wellbeing. I have always had an interest in research, but this experience has bolstered my skills, confidence and passion for it. I see a future for myself as a qualified clinician that includes ongoing involvement in research and academia. Most

importantly, this thesis has helped me better appreciate how research can be meaningfully translated into real-world clinical practice and has strengthened my identity as a scientist-practitioner.

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Appendices

Appendix A

Table A1

Search terms used for systematic review and meta-analysis

Concept	Search Terms
Population/participants	menopaus* or perimenopaus* or peri-menopaus* or “peri menopaus*” or postmenopaus* or post-menopaus* or “post menopaus*” or “menopaus* transition” or climacteric or “climacteric syndrome”
Intervention	"physical activit*" or "physical exercis*" or exercis* or aerobic* or "aerobic exercis*" or "strength training" or "high intensity interval training" or "HIIT" or fitness or "resistance train*" or "aquatic exercise*" or danc* or zumba or pilates or yoga or walk* or sport* or swim* or run* or movement or "martial arts"
Outcome	Mood: mood or emotion* or affect* or feel* or stress or distress or depressi* or anxi*
	Cognition: cogniti* or “cogniti* functioning” or “cognit* symptom*” or memor*
	Quality of life: “quality of life” or “QOL” or wellbeing or “psychological wellbeing” or “menopause related quality of life”
Design	randomi*ed control* trial* or randomi*ed clinical trial* or RCT or RCTs or randomi*ed control* design

Figure A1

Funnel plot for depression outcomes

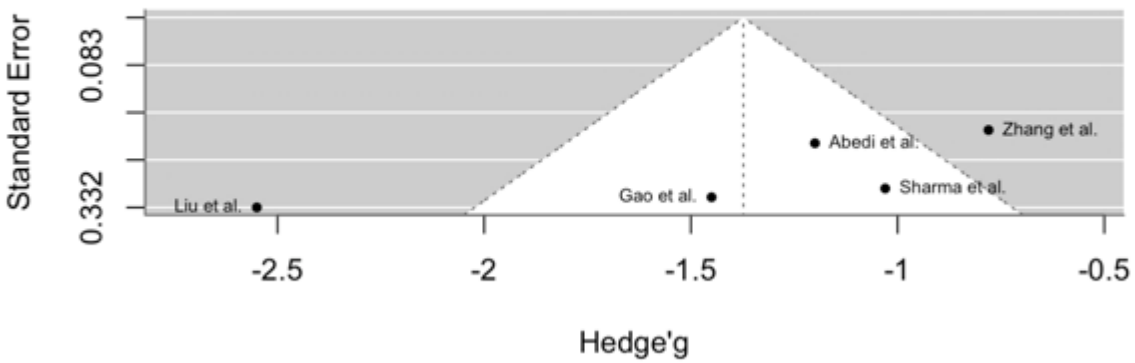


Figure A2

Funnel plot for mood outcomes

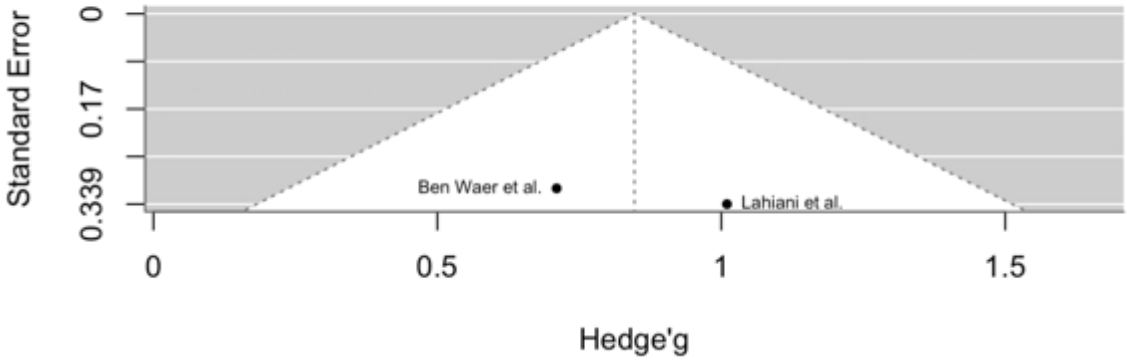


Figure A3

Funnel plot for psychological QoL outcomes

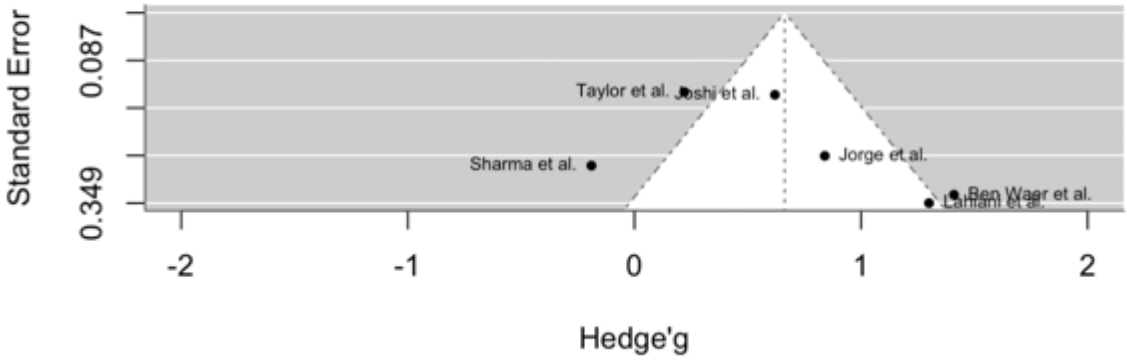


Figure A4

Funnel plot for overall QoL outcomes

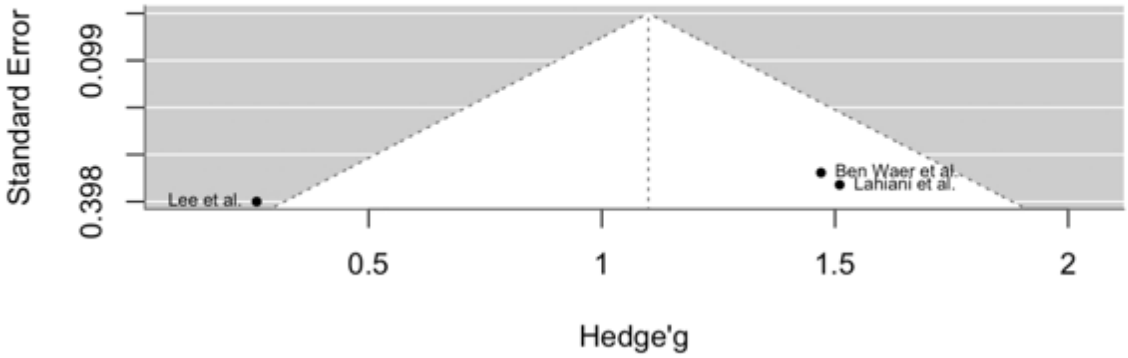


Figure A5

Forest plot of pre-posttest change analysis of depression outcomes

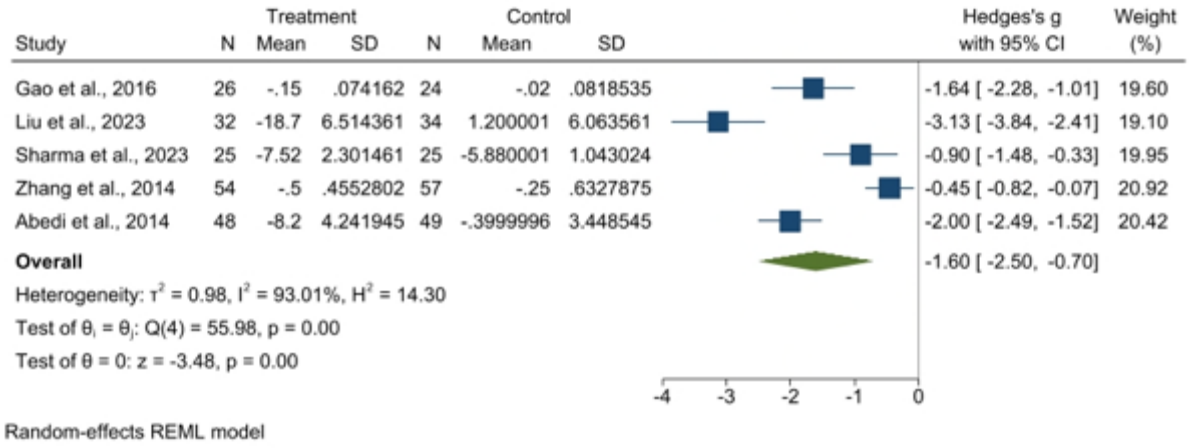


Figure A6

Forest plot of pre-posttest change analysis by menopausal stage for depression outcomes

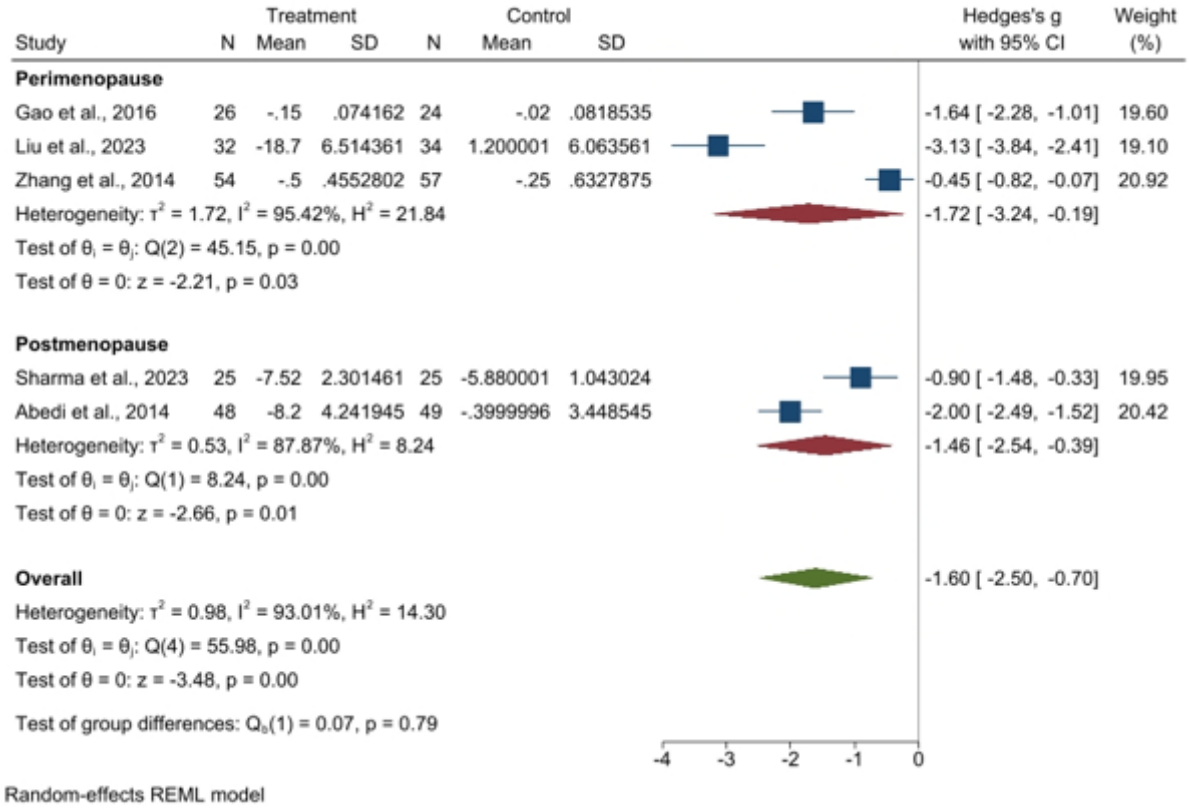


Figure A7

Forest plot of pre–posttest change analysis by intervention type for depression outcomes

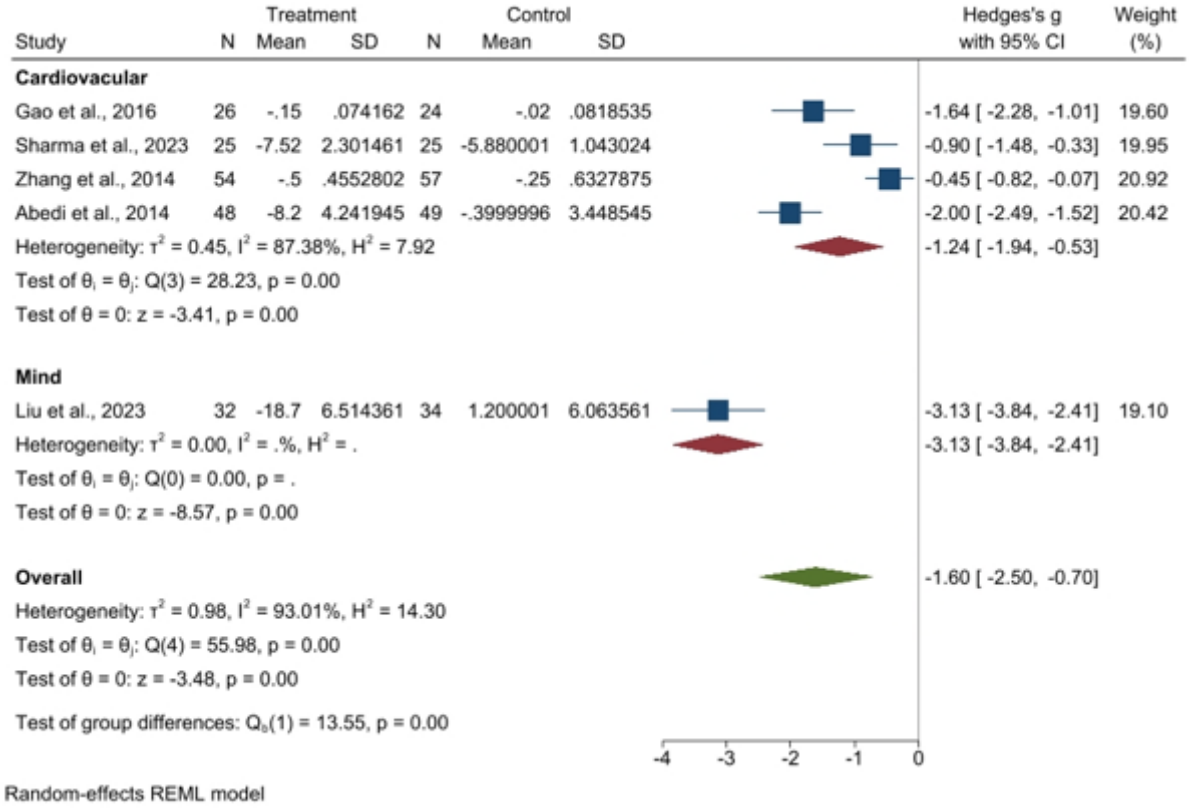


Figure A8

Forest plot of pre-posttest change analysis of mood outcomes

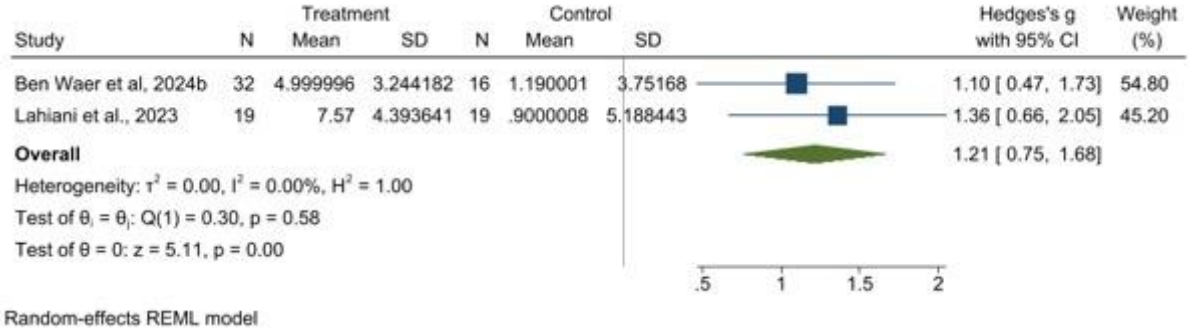


Figure A9

Forest plot of pre-posttest change analysis by intervention type for mood outcomes

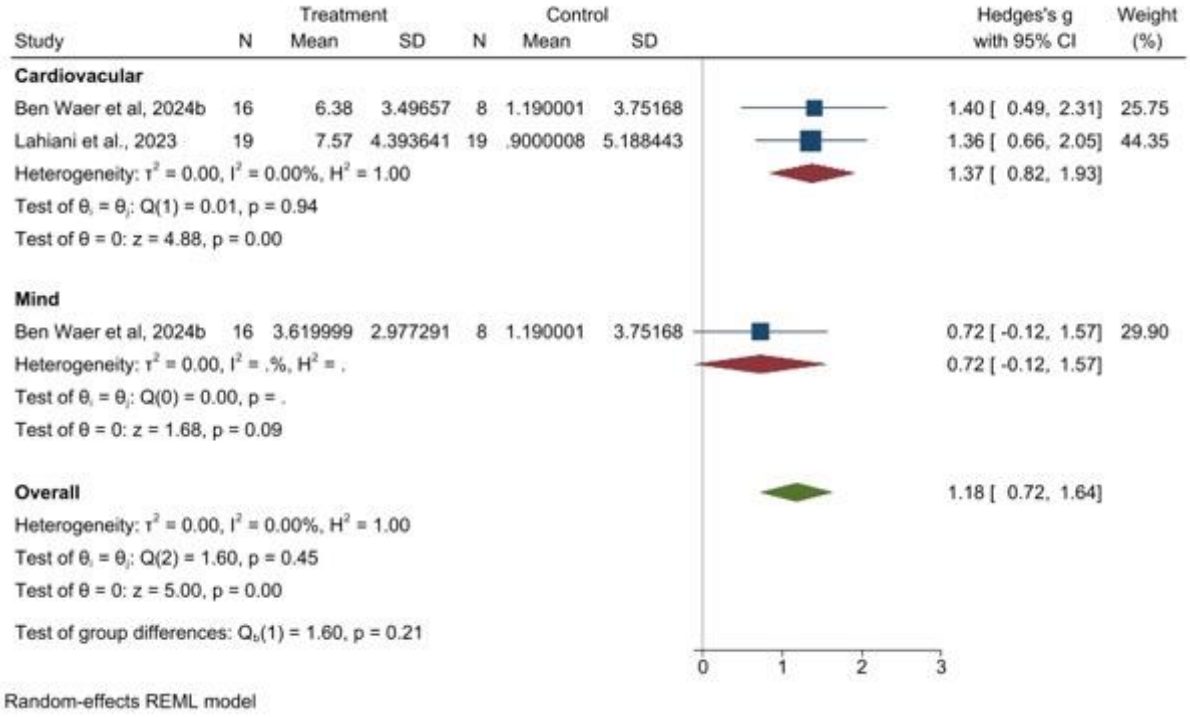


Figure A10

Forest plot of pre-posttest change analysis of psychological QoL outcomes

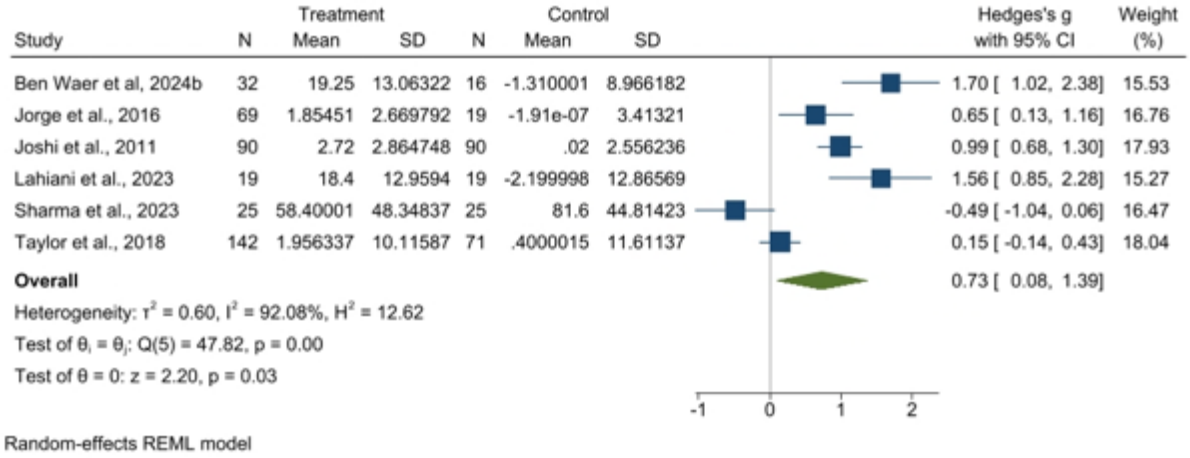


Figure A11

Forest plot of pre-posttest change analysis by menopausal stage for psychological QoL outcomes

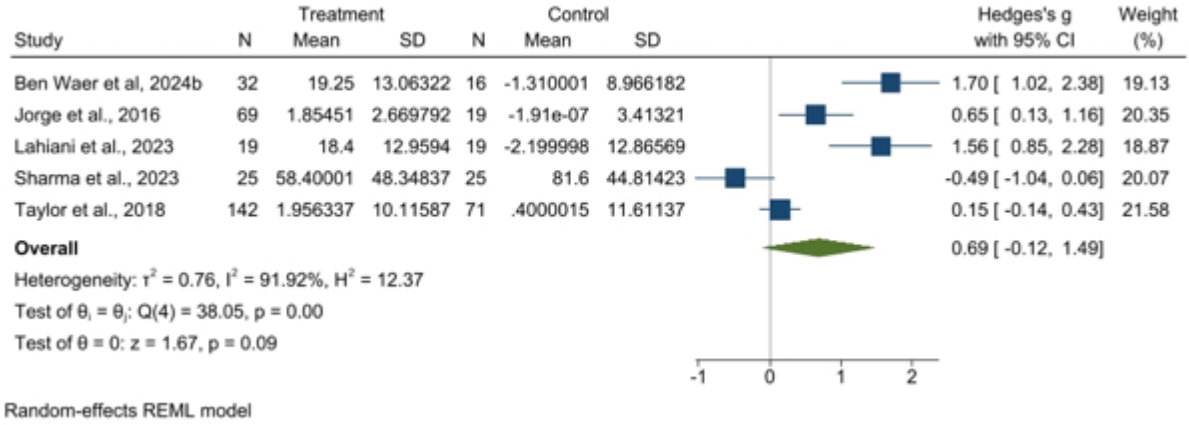


Figure A12

Forest plot of pre-posttest change analysis by intervention type for psychological QoL outcomes

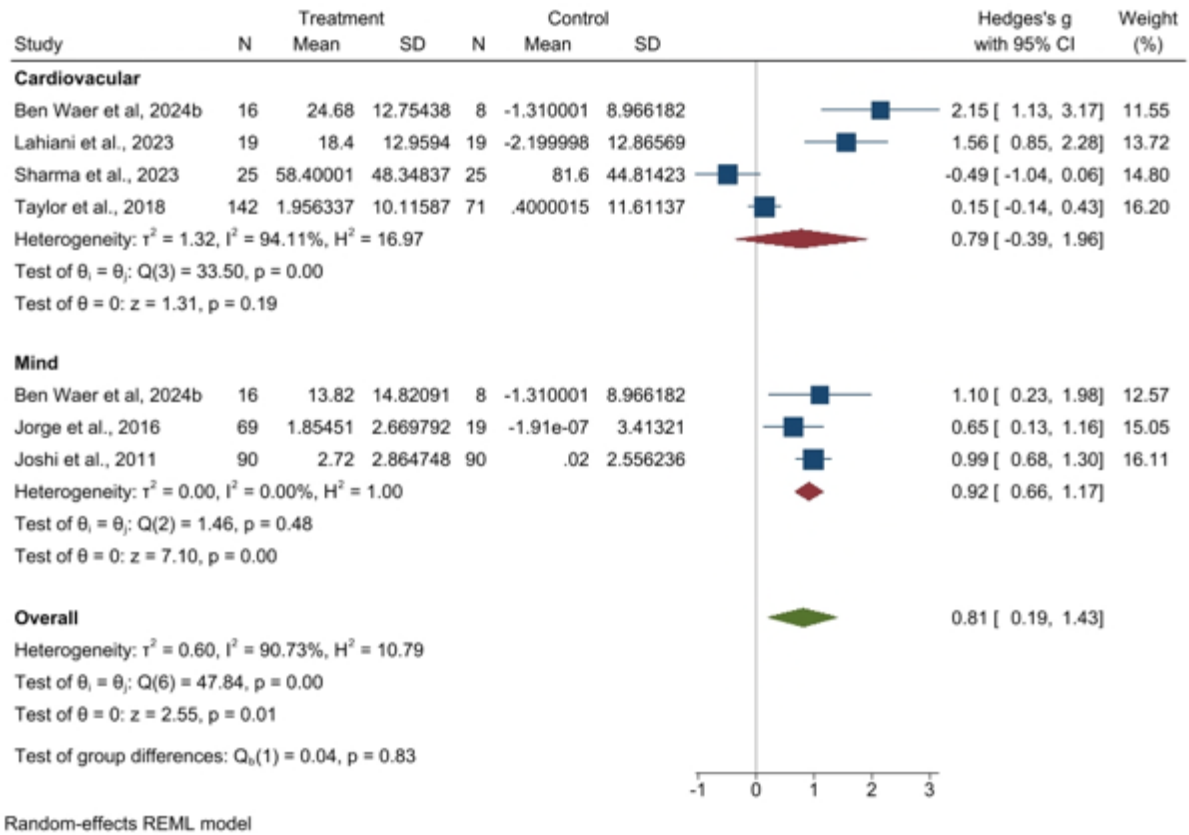


Figure A13

Forest plot of pre-posttest change analysis for overall QoL outcomes

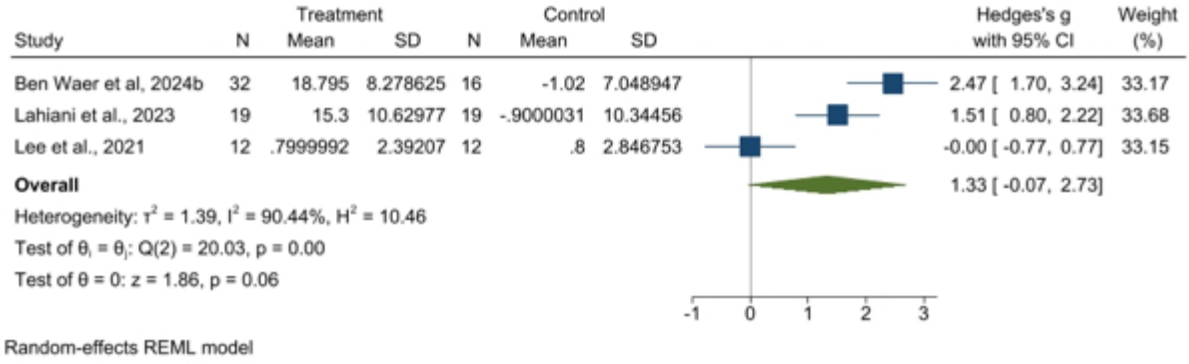
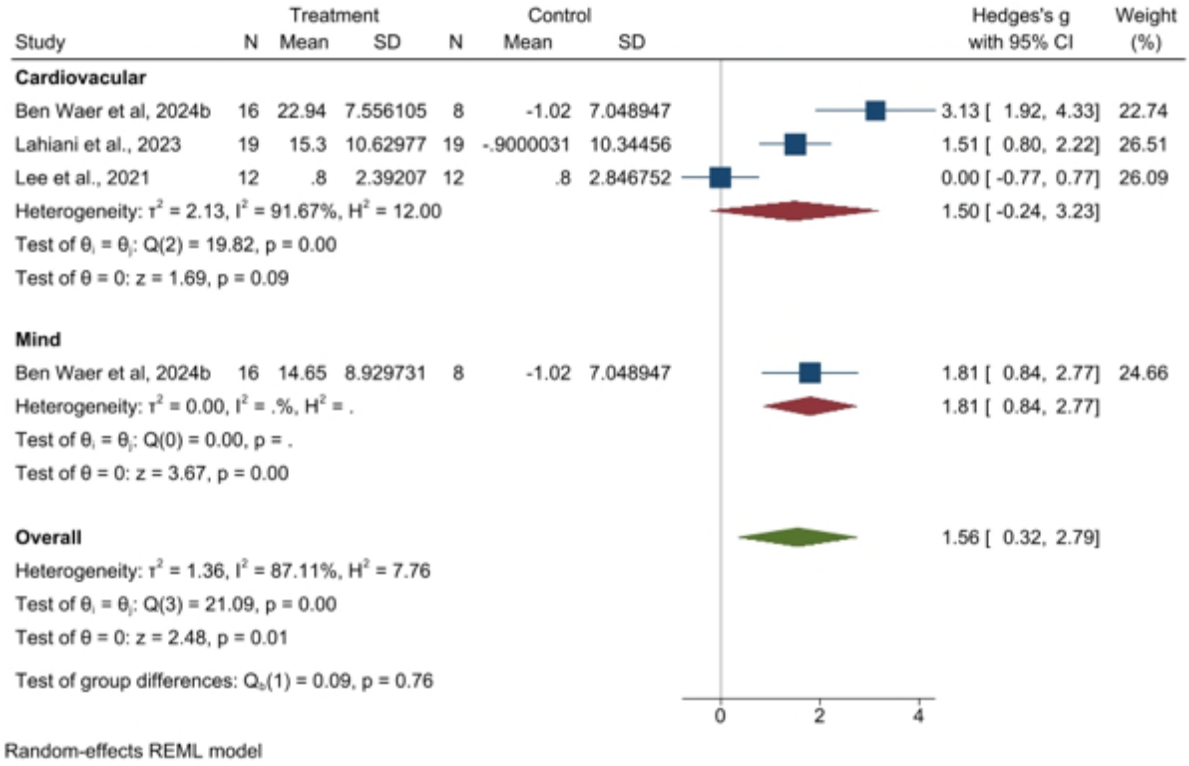


Figure A14

Forest plot of pre-posttest sensitivity analysis by intervention type for overall QoL outcomes



Appendix B

B1. Study ethical approval from

RESEARCH AND INNOVATION SERVICES

UCL

24th April 2024

Professor Aimee Spector
Research Department of Clinical, Education and Health Psychology
UCL

Cc: Dr Helen Donovan

Dear Professor Spector

Notification of Ethical Approval
Ethics ID and Title: 26701/001: The feasibility and effects of group Compassionate Mind Training (CMT) for adults experiencing the menopause transition: a preliminary investigation

Further to your satisfactory responses to reviewer comments, I am now very pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee (REC) that your low-risk application has been ethically approved by the UCL REC until **9th October 2025.**

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research
Please seek Chair's approval for proposed amendments (to include extensions to the duration of the project) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form'
https://www.ucl.ac.uk/research-ethics/responsibilities-after-approval

Adverse Event Reporting – Serious and Non-Serious
It is your responsibility to report to the REC any unanticipated problems or adverse events involving risks to participants or others. The REC should be notified of all serious adverse events via the Research Ethics Service (ethics@ucl.ac.uk) immediately after the incident occurs. Where the adverse incident is unexpected and serious, the Chair will decide whether the study should be terminated pending the opinion of an independent expert.

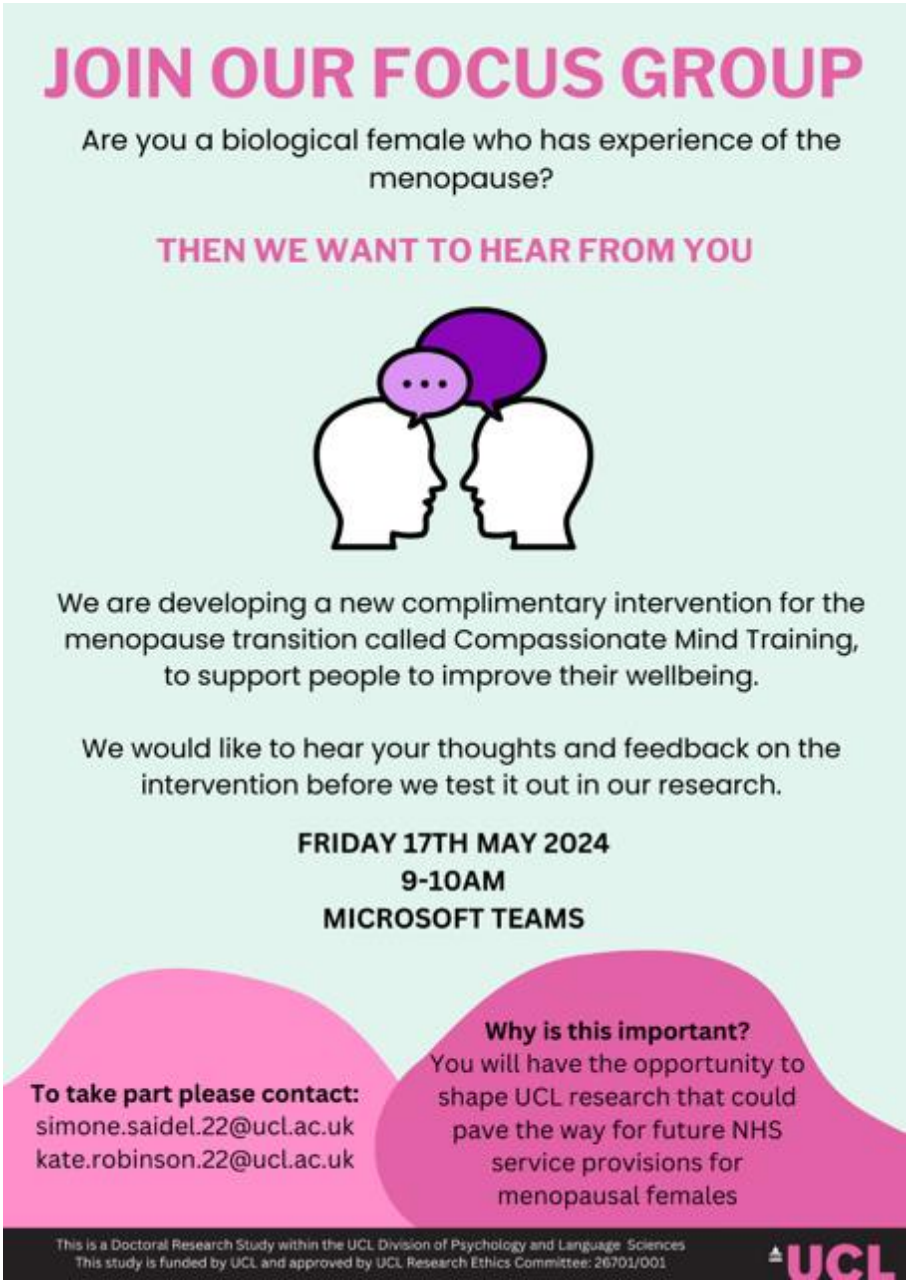
For non-serious adverse events, the Chair should again be notified via the Research Ethics Service within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Chair will confirm that the incident is non-serious and report to the REC at the next meeting. The final view of the REC will be communicated to you.

Final Report
At the end of the data collection element of your research we ask that you submit a very brief report (1-2 paragraphs will suffice) which includes issues relating to the ethical implications of the research i.e., any issues obtaining consent, participants withdrawing from the research, confidentiality, protection of participants from physical and mental harm etc.

Research Ethics Service
Research and Innovation Services
University College London
ethics@ucl.ac.uk
www.ucl.ac.uk/research-ethics/

B2. Focus group recruitment poster for healthcare professionals

B3. Focus group recruitment poster for members of the pubic



B4. Interview schedule for focus group with healthcare professionals

Introduction

Welcoming the group and introduce ourselves and each other's role/sense. Explain the study summarising the below:

- We are investigating whether online group-based Compassionate Mind Training, a type of psychological intervention, can support the wellbeing of those experiencing the menopause transition. Compassionate Mind Training (CMT) helps people develop the ability to be look after themselves, known as self-compassion, to improve their wellbeing.
- For those experiencing the menopause, it can be accompanied by a range of symptoms that impact their quality of life and wellbeing, such as low mood, anxiety and stress.
- There is research suggesting that higher self-compassion is associated with greater wellbeing in menopause.
- A previous study of online self-help CMT for the menopause received positive feedback for the therapy and people improved in several areas including self-compassion. Considering the existing literature, there is scope to investigate high intensity CMT as an intervention for treating psychological difficulties in menopausal adults.
- Group CMT has been found to be effective in other groups so this combined to the previous menopause literature, and groups being more economic and practical for the NHS, this study is interested in looking at the impact of group CMT for the menopause.
- Our aim is to determine whether online group-based compassionate mind training (CMT) can be feasibly used with adults experiencing menopause, to improve psychological wellbeing and quality of life.
- This project is intended as a preliminary exploration to establish whether intervention modifications are necessary and provide direction for further evaluation of intervention efficacy.
- This study will be a feasibility randomised controlled trial of online, group CMT plus treatment as usual compared to treatment as usual.
- A combination of quantitative and qualitative analysis will explore the feasibility of recruitment and eligibility, participant willingness to be

randomised, retention rates in both the intervention and overall trial, suitability of outcome measures and acceptability of group CMT for this population. Preliminary effects on a range of clinical outcomes will also be explored.

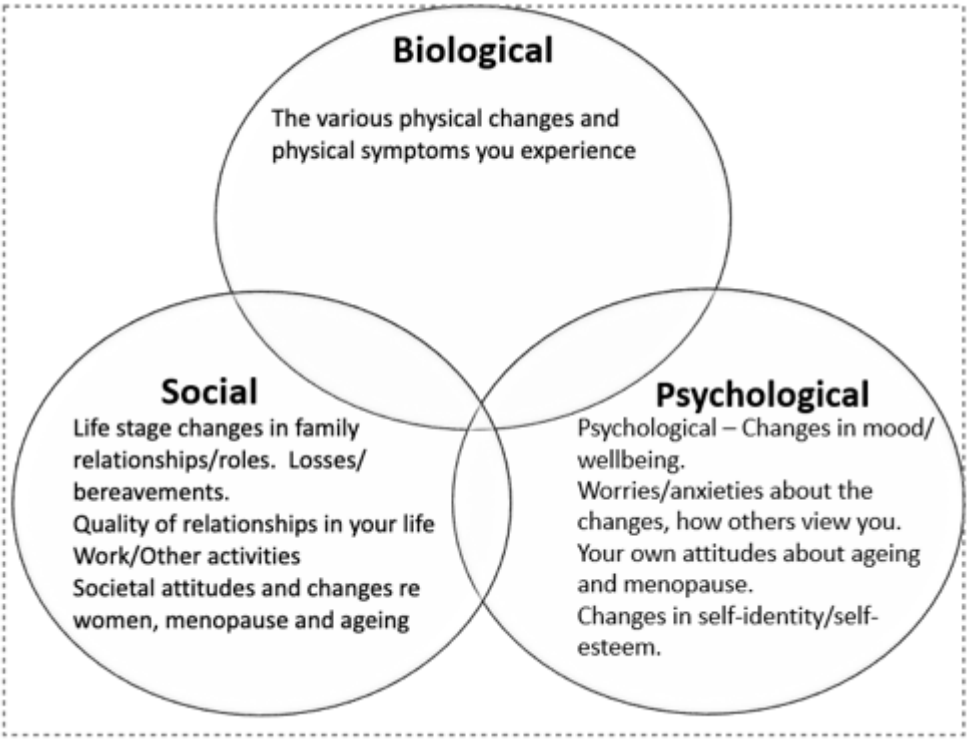
- Our intervention will be across 6 sessions; lasting 2 hours per session. It will involve a mixture of psychoeducation, in-session exercises, group discussions and takeaway tasks.

Practicalities

1. Timings of the sessions – decided a morning session (9:30-11:30) and evening session (18:00-20:00)
    a. Do you think these are suitable timings that would work?
2. Show the recruitment poster (see Figure B1) and explain recruitment process
    a. What do you think of the poster?
    b. What could we do differently to support with recruitment?
    c. Are there any cultural factors we need to consider for recruitment ?

Content

1. Show powerpoint (Session 1) slides 1-3 and 4-8 and (Session 2) Summary sheet
    a. Are we using appropriate/accessible language?
    b. How are the materials to follow and are they visually appealing?
    c. What do you think about the information provided on the slides?
    d. Are there any other ways you think we could communicate the information?
2. Show powerpoint (Session 3) slides 9-10
    a. How do you think these tasks and discussions will work in practice?
    b. How do you think people would feel sharing their own experience
    c. Is their anything we could do to help develop a supportive group dynamic?
    d. Are the identified fears and blocks to compassion relevant for people with menopause?
3. Show bio-psycho-social figure
    a. What do you think about the specific information and examples included about menopause?



B5. Interview schedule for focus group with members of the public

Introduction

Welcoming the group and introduce ourselves and each other's role/sense. Explain the study summarising the below:

- For some background information, we are investigating whether online group-based Compassionate Mind Training, a type of psychological intervention, can support the wellbeing of those experiencing the menopause transition.
- Compassionate Mind Training (CMT) helps people develop the ability to be look after themselves, known as self-compassion, to improve their wellbeing.
- For those experiencing the menopause, it can be accompanied by a range of symptoms that impact their quality of life and wellbeing, such as low mood, anxiety and stress. There is research suggesting that higher self-compassion is associated with greater wellbeing in menopause.
- Therefore, the purpose of this study is to see whether people experiencing the menopause find CMT to be a suitable and helpful treatment option for reducing these psychological symptoms. People taking part will either be randomised to the intervention group or will be in the control group.

- Our intervention will be across 6 sessions; lasting 90 mins per session. It will involve a mixture of psychoeducation, in-session exercises and group discussions.

Practicalities

1. Timings of the sessions – decided a morning session (9:30-11:30) and evening session (18:00-20:00)
    a. Do you think these are suitable timings that would work?
2. Show the recruitment poster (see Figure B1) and explain recruitment process
    a. What do you think of the poster?
    b. What could we do differently to support with recruitment?
    c. Would you be motivated to take part in the study?
    d. What can we do to make our study more engaging for you and others?
    e. Are there any cultural factors we need to consider?
    f. What do you think about it being an online group?

Content

1. Show powerpoint (Session 1) slides 1-3 and 4-8, (Session 2) summary sheet and (Session 3) slides 9-10
    a. Are we using appropriate/accessible language?
    b. How are the materials to follow and are they visually appealing?
    c. Are there any other ways you think we could communicate the information?
2. Play Moment of Self-Care exercise
    a. How did you find this exercise? Prompts: length? Was it easy to follow?
    b. Would you prefer the facilitator's voice or another person's voice leading the exercises?
    c. What could we do as facilitators to support practicing the exercises between sessions?

Group tasks

1. Thoughts on how to set these up?
2. How would you feel sharing your own experiences in a small group or feeding back to the larger group?
3. How can we help to encourage discussion and peer support?

4. Is there anything we could do to help develop a supportive group dynamic?
5. Is their anything we could do to help develop a supportive group dynamic?

Figure B1

Study recruitment poster

B6. Participant information sheet (accessed via Qualtrics)

PARTICIPANT INFORMATION SHEET

UCL Research Ethics Committee Approval ID Number: 26701/001

Compassionate Mind Training for adults experiencing menopause.

We would like to invite you to take part in our postgraduate research study. Before you decide we would like you to understand why the research is being done and what is involved in taking part. You should only participate if you want to, therefore please take time to read the following information. Please ask us if anything is unclear or if you would like further information. You can contact the research team by email at any time:

Simone Saidel - simone.saidel.22@ucl.ac.uk
Kate Robinson - kate.robinson.22@ucl.ac.uk

What is the purpose of this study?

Compassionate Mind Training (CMT) helps people develop the ability to be look after themselves, known as self-compassion, to improve their wellbeing. For those experiencing the menopause, it can be accompanied by a range of symptoms that impact their quality of life and wellbeing, such as low mood, anxiety and stress. There is research suggesting that higher self-compassion is associated with greater wellbeing in menopause. Therefore, the purpose of this study is to see whether people experiencing the menopause find CMT to be a suitable and helpful treatment option for reducing these psychological symptoms.

Who can take part in the study?

The research is for biologically female adults aged 40-60 who are experiencing the menopause

transition. Approximately 40 people will take part. You have been selected to be involved in the study as you meet the inclusion criteria and have expressed an interest in taking part.

Do I have to take part?

No, you do not have to take part in this study if you do not want to. You will be able to ask questions about the study before you decide whether to participate. You can also change your mind and leave the study at any time, without giving a reason. If you decide to withdraw you will be asked what you wish to happen to the data you have provided up to that point. If you would like to withdraw your data from being included in the analysis and report, data withdrawal requests can be made up to and including 1st December 2024.

What will happen if I take part?

Everyone who takes part in the study will be asked to provide consent and complete a set of questionnaires at the beginning and end of the research study. You will be asked to complete these questionnaires online and they will include questions on various topics such as your experience of menopause, your emotions, and quality of life.

After you have completed the first set of questionnaires, you will be randomly allocated by a computer to either receive four sessions of online group CMT group or no treatment (rather like flipping a coin). This means it is completely up to chance whether you receive the group CMT sessions. If you are not allocated to the CMT group, you will not receive the training. This means we can compare how those in the CMT group have got on compared to those who did not partake in the sessions.

Participation in the study lasts up to 12 weeks in total including the follow up interview. If you are allocated to the CMT group, you will be invited to attend 6 virtual group sessions, each lasting 90 minutes (9 hours in total). There will be up to 10 participants in each group, and 2 facilitators. In the CMT group, you will learn strategies and techniques to improve your well-being. You will be encouraged to practice these outside of the session. After 6 weeks, all participants will be asked to complete the questionnaires again regardless of your group allocation. Following this, you will be invited to take part in a 30-minute online interview to share your experience of taking part in the study. Regardless of group allocation, you will receive the therapy materials used for the CMT group, at the end of the study.

Will I be recorded and how will the recorded material be used?

The results of the study are to be written up into a scientific research report which will be put forward to be published, in which no individual can be identified. We will use anonymised quotes in the report if consent is given. If you opt into receive a copy of the results, they will be made available to you.

What if something goes wrong or I have a complaint?

If you have a concern about any aspect of this research, please contact Professor Aimee Spector in the first instance (a.spector@ucl.ac.uk). If you feel your feedback has not been handled to your satisfaction or wish to make a formal complaint, please contact the Chair of the UCL Research Ethics Committee who will seek to resolve the matter as soon as possible: ethics@ucl.ac.uk.

What will happen to my data?

University College London (UCL) is the data controller for this project and will determine how your personal data (name, contact details and date of birth) and special category personal data (health and ethnicity) are used in the study. The UCL Data Protection Officer can be contacted at data-protection@ucl.ac.uk. Further information on how UCL uses participant information can be found here: www.ucl.ac.uk/privacy-notice.

The lawful basis used to process your personal data will be performance a public task. The lawful basis used to process special category data will be for research purposes. Your personal data will be processed as long as it is required for the research project. We will pseudonymise, and where possible, anonymise your personal data and will endeavour to minimise the processing of personal data wherever possible. If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact The UCL Data Protection Officer in the first instance.

Personal data will be stored securely in a password protected file only accessible by a member of the research team. We will delete personal information after the study has finished. However, if you would like to be sent a copy of the results at the end of the study, we will retain your contact details for an additional 12 months. In this case, your contact details will be deleted once the results have been sent to you. This excludes consent forms and questionnaires which will be held securely by UCL for a minimum of 10 years after the end of the study, as per the guidance in the UCL Research Data Policy. We will ensure that all the requirements of the Data Protection Action 2018 and General Data Protection Regulation are complied with.

Who has reviewed the study?

The study has been reviewed by an independent group of people called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. This study has been reviewed and approved: 26701/001

Sources of support

If you are affected by any of the questions in the questionnaire, are concerned about your mental health or you notice any distress whilst taking part in the study, please contact any of the following services:

- Your GP
- NHS 111 (Option 2)
- Samaritans on 116 123
- If you are in a crisis or experience a medical emergency, please call 999 or attend your local A&E department

The research team

The research team are members of the Menopause Mind Lab at UCL, within the Department of Psychology and Language Sciences. You can find out more about the Menopause Mind Lab by visiting the website: www.ucl.ac.uk/menopause-mind-lab

Professor Aimee Spector (Principal Researcher)
a.spector@ucl.ac.uk

Simone Saidel (Trainee Clinical Psychologist)
simone.saidel.22@ucl.ac.uk

Kate Robinson (Trainee Clinical Psychologist)
kate.robinson.22@ucl.ac.uk

Once you have read the information sheet and have decided you would like to take part, please continue to the next page to complete the screening process.

B7. Pre-consent form and screening measures (accessed via Qualtrics)

Participant Screening: Compassionate Mind Training for adults experiencing menopause.

Before you can agree to participating in the study, it is necessary to see whether this research is a suitable fit for you and if it is appropriate for you to take part in. On the following pages are screening questionnaires to establish whether you can be invited to take part in the study. This screening process lasts around 10 minutes and includes collecting basic information about yourself in addition to questions relating to wellbeing and menopause. We greatly appreciate your time and effort with completing these.

Before you can proceed to the screening form, please confirm the following by selecting the boxes

Please note you may only take part in this study if you are 18 years old or over.

I certify that I am 18 years old or over.

- ○ Yes

If you have read the information sheet and agree to continue with the screening form with the understanding that the data (including any personal data) you submit will be processed accordingly, please check the relevant box below.

Please note that if you have decided not to take part and click 'I do not give consent', you will be automatically directed to the end of the survey and can close the browser window.

- ○ I give consent.
- ○ I do not give consent.

This study has certain requirements to support your taking part. To participate, we ask you to confirm the following:

Is English your primary language?

- ○ Yes
- ○ No

Can you speak and understand English fluently?

- ○ Yes
- ○ No

Do you have access to a computer or other device with a stable internet connection?

- ○ Yes
- ○ No

Do you feel confident and able to use Microsoft Teams?

- ○ Yes
- ○ No

Can you commit to a 1.5-hour weekly session for a period of 6 weeks?

- ○ Yes
- ○ No

Are you willing to take part in a post-study interview about your experience of taking part in the study?

- ○ Yes
- ○ No

Information about You

What is your name?

_____

What is your date of birth?

_____

What is your current age?

_____

Please indicate your gender

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Other
- ○ Prefer not to say

Were you assigned female at birth?

- ○ Yes
- ○ No

Do you identify as experiencing symptoms of the menopause?

- ○ Yes
- ○ No

Stages of Reproductive Aging

Please answer the following questions. If you have experienced a medically induced menopause, please go directly to question 3:

1) Has the length of your total menstrual cycle reduced by approximately 7 days?

- ○ Yes
- ○ No

2) Have you skipped 2 or more menstrual cycles, with at least 1 interval being 60 days or more?

- ○ Yes
- ○ No

3) If you have had your final menstrual period, has this been in the last 4 years?

- ○ Yes
- ○ No

Menopause Representations Questionnaire

Please rate to what extent you think the following experiences are part of your menopause by choosing: Yes (Yes, this is part of my menopause), Uncertain (Uncertain whether this is part of my menopause), or No (Not part of my menopause)

	Yes	Uncertain	No
1. Tiredness	○	○	○
2. Hot flushes	○	○	○
3. Aches and pains	○	○	○
4. Headaches	○	○	○
5. Sleep difficulties	○	○	○
6. Dizziness	○	○	○
7. Irregular periods	○	○	○
8. Depression	○	○	○
9. Feeling bloated	○	○	○
10. Skin problems	○	○	○
11. Mood swings	○	○	○
12. Night sweats	○	○	○
13. Memory loss	○	○	○
14. Heavy periods	○	○	○
15. Anxiety	○	○	○
16. Breathlessness	○	○	○
17. Vaginal dryness	○	○	○

18. Decreased sexual interest	○	○	○
19. Increased weight	○	○	○
20. Stiff joints	○	○	○

Anxiety Questionnaire

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	0 - Not at all	1 - Several Days	2 - More than half the days	3 - Nearly everyday day
1. Feeling nervous, anxious or on edge	○	○	○	○
2. Not being able to stop or control worrying	○	○	○	○
3. Worrying too much about different things	○	○	○	○
4. Trouble relaxing	○	○	○	○
5. Being so restless that it is hard to sit still	○	○	○	○
6. Becoming easily annoyed or irritable	○	○	○	○
7. Feeling afraid as if something awful might happen	○	○	○	○

Depression Questionnaire

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	0 - Not at all	1 - Several Days	2 - More than half the days	3 - Nearly everyday day
1. Little interest or pleasure in doing things	○	○	○	○
2. Feeling down, depressed or hopeless	○	○	○	○
3. Trouble falling or staying asleep, or sleeping too much	○	○	○	○
4. Feeling tired or having little energy	○	○	○	○
5. Poor appetite or overeating	○	○	○	○
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	○	○	○	○
7. Trouble concentrating on things, such as reading the newspaper or watching television	○	○	○	○
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	○	○	○	○

9. Thoughts that you would be better off dead or of hurting yourself in some way	○	○	○	○

We greatly thank you for expressing interest in this project and for taking the time to complete the study screening. Regardless of whether you are eligible or not for the study, we will contact you within 2 weeks to update you on the outcome. If you have not heard from us by then, please do not hesitate to get in contact with a member of the research team.
Simone Saidel -
Kate Robinson -

Please provide your email address.

_____

Please provide your phone number.

_____

B8. Email template to eligible participants

Dear [INSERT NAME],

Thank you for expressing your interest in the research “Compassionate Mind Training to support women during the menopause transition.” Based on the information you have provided on the screening form; we are pleased to let you know that you are eligible to take part in our study.

You noted you would be able to attend [INSERT GROUP OPTION] group. Please can you confirm if this is still the case?

If you would still like to take part, please complete the following online consent form: [INSERT LINK]

Once we have received your consent form, you will be sent a set of questionnaires to complete before being randomised to either the intervention or the non-intervention group.

If you have any questions or wish to discuss the study further before completing the consent form, please don't hesitate to contact us.

All the best,

Simone and Kate

B9. Email template to ineligible participants

Dear [INSERT NAME],

I hope this email finds you well. Thank you for expressing your interest in the research "Compassionate Mind Training to support women during the menopause transition." Based on the information you provided on the screening form; we regret to inform you that you are not eligible to take part in the study at this time.

Please note that this does not impact your eligibility for participating in further research. So please do keep an eye out for other opportunities to participate in research with the Menopause Mind Lab.

Thank you once again for your understanding and for considering participation in our research.

All the best,

Simone and Kate

B10. Participant consent form

Compassionate Mind Training for adults experiencing the menopause.

Please only complete this consent form after you have read the Information Sheet.

Thank you for considering taking part in this research. If you have any questions arising from the Information Sheet, please ask a member of the research team before you decide whether to join in. You will be sent a copy of this Consent Form to keep and refer to at any time.

I confirm that I understand that by clicking and highlighting each statement below I am consenting to this element of the study. I understand that it will be assumed that any statements I do not click, means that I DO NOT consent to

that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

☐ I confirm that I have read and understand the information sheet (version 1.0, 24.12.2023) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

☐ I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without penalty.

☐ I understand that I can request to have my data withdrawn from the study up to and including the 1st December 2024.

☐ I understand that research data collected during the study may be looked at by designated individuals from UCL where it is relevant to my taking part in this study. I give permission for these individuals to have access to this data.

☐ I understand who will have access to my personal data (name, email address and date of birth), how the data will be stored and used, and what will happen to the data at the end of the project. I understand that according to data protection legislation, ‘public task’ will be the lawful basis for processing personal data and 'research purposes' will be the lawful process for processing special category data.

☐ I understand that all information will be kept strictly confidential except in rare circumstances in which it is judged that I am, or someone else is, at immediate risk of serious harm, or where information is requested by a court of law.

☐ I understand that my anonymised research data may be shared with, and used by, others for future research.

☐ I understand that this project has been reviewed by and received ethics clearance through UCL Research Ethics Committee.

☐ I understand that the information I have submitted will be published as a report.

☐ I understand how to raise a concern or make a complaint.

☐ I understand that to participate in this study, I may be required to take part in an interview and that this interview will be audio recorded.

☐ I consent to my interview being audio recorded and understand that the recordings will be stored anonymously using password-protected software and will be used for specific research purposes.

☐ I agree to take part in the above study including an interview.

☐ ***Optional:*** I agree for my contact details to be kept in a secure database so that I can receive a copy of the study results.

Name of participant

_____

Date

_____

B11. Email template with link to baseline questionnaire

Dear [INSERT NAME],

Thank you for completing the consent form; we are really pleased to have you as part of our research.

The next step is to complete a set of questionnaires, which are being sent to all participants. Some questions may be applicable to you; however, please answer all of these to the best of your ability.

Once we receive your responses, you will be randomly assigned to either the intervention or non-intervention group. Randomisation is by chance (just like flipping a coin). A member of the research team will then call you to inform you of the outcome.

Here is the link to the questionnaires: [INSERT LINK]

Please do not hesitate to contact us if you need any further support.

All the best,
Simone and Kate

B12. Study questionnaire pack (accessed via Qualtrics)

Information about You

What is your name? (please include first name and surname)

_____

What is your date of birth?

_____

What is your current age?

_____

Please indicate your gender:

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Other
- ○ Prefer not to say

Please choose which best describes your ethnicity:

- ○ Asian or Asian British
- ○ Black, Black British, Caribbean or African
- ○ Mixed or multiple ethnic groups
- ○ White

- ○ Other

Are you currently taking HRT (hormone replacement therapy)?

- ○ Yes
- ○ No

If yes, how long have you been taking this for?

- ○ Less than 6 months
- ○ More than 6 months

Are you taking contraception?

- ☐ Copper coil
- ☐ Hormonal coil
- ☐ Combined pill
- ☐ Progesterone only pill (The mini pill)
- ☐ Contraceptive patch
- ☐ Depo injection (depo-provera)
- ☐ Implant
- ☐ Not applicable

Are you taking contraception?

- ☐ Copper coil
- ☐ Hormonal coil

- [ ] Combined pill
- [ ] Progesterone only pill (The mini pill)
- [ ] Contraceptive patch
- [ ] Depo injection (depo-provera)
- [ ] Implant
- [ ] Not applicable

If yes, how long have you had this/been taking this for?

- ○ Less than 6 months
- ○ More than 6 months

Are you taking medication for your mental health?

- ○ Yes
- ○ No

If yes, how long have you been taking this for?

- ○ Less than 6 months
- ○ More than 6 months

Menopause Questionnaire

Please rate to what extrent you think the following experiences are part of your menopause by choosing: Yes (Yes, this is part of my menopause), Uncertain (Uncertain whether this is part of my menopause) or No (Not part of my menopause)

	Yes	Uncertain	No

1. Tiredness	○	○	○
2. Hot flushes	○	○	○
3. Aches and pains	○	○	○
4. Headaches	○	○	○
5. Sleep difficulties	○	○	○
6. Dizziness	○	○	○
7. Irregular periods	○	○	○
8. Depression	○	○	○
9. Feeling bloated	○	○	○
10. Skin problems	○	○	○
11. Mood swings	○	○	○
12. Night sweats	○	○	○
13. Memory loss	○	○	○
14. Heavy periods	○	○	○
15. Anxiety	○	○	○
16. Breathlessness	○	○	○
17. Vaginal dryness	○	○	○
18. Decreased sexual interest	○	○	○
19. Increased weight	○	○	○

20. Stiff joints	○	○	○

Menopause Questionnaire

We are interested in your own personal views of how you see your menopause. Please indicate how much you agree or disagree with the following statements about your menopause.

	Strongly agree	Agree	Neither agree not disagree	Disagree	Strongly disagree
1. Going through menopause has an impact on my life.	○	○	○	○	○
2. It's a relief to be free from the risk of pregnancy.	○	○	○	○	○
3. My menopause will last about a year.	○	○	○	○	○
4. The menopause has affected the way I see myself as a person.	○	○	○	○	○
5. Overall, I feel I am able to cope reasonably well with my menopause.	○	○	○	○	○
6. I feel less confident since the menopause.	○	○	○	○	○
7. My menopause	○	○	○	○	○

will last a long time.					
8.If I have problems during the menopause, I know what I can do to help myself.	○	○	○	○	○
9. I feel more content during this phase of life.	○	○	○	○	○
10. The menopause has affected the way others see me.	○	○	○	○	○
11. I am pleased that periods come to an end.	○	○	○	○	○
12. I feel more emotional than I did before the menopause.	○	○	○	○	○
13. It is good to be moving into a new phase of life.	○	○	○	○	○
14. I am confident that I can deal with any changes that my menopause might bring.	○	○	○	○	○
15. My menopause	○	○	○	○	○

will last a short time.					
16. In time my menopausal symptoms will improve.	○	○	○	○	○
17. I feel I have the resources to manage my menopause well.	○	○	○	○	○

Fears of Compassion Scale Questionnaire

Different people have different views of compassion and kindness. While some people believe that it is important to show compassion and kindness in all situations and contexts, others believe we should be more cautious and can worry about showing it too much to ourselves and to others. We are interested in your thoughts and beliefs in regard to kindness and compassion in three areas of your life: 1. Expressing compassion for others 2. Responding to compassion from others 3. Expressing kindness and compassion towards yourself Below are a series of statements that we would like you to think carefully about and then mark the number that best describes how each statement fits you.

Scale 1: Expressing compassion for others

	0 - Don't agree at all	1	2 - Somewhat agree	3	4 - Completely agree
1. People will take advantage of me if they see me as too compassionate	○	○	○	○	○
2. Being compassionate towards people	○	○	○	○	○

who have done bad things is letting them off the hook					
3. There are some people in life who don't deserve compassion	○	○	○	○	○
4. I fear that being too compassionate makes people an easy target	○	○	○	○	○
5. People will take advantage of you if you are too forgiving and compassionate	○	○	○	○	○
6. I worry that if I am compassionate, vulnerable people can be drawn to me and drain my emotional resources	○	○	○	○	○
7. People need to help themselves rather than waiting for others to help them	○	○	○	○	○
8. I fear that if I am compassionate, some people will become too dependent upon me	○	○	○	○	○

9. Being too compassionate makes people soft and easy to take advantage of	○	○	○	○	○
10. For some people, I think discipline and proper punishments are more helpful than being compassionate to them	○	○	○	○	○

Scale 2: Responding to the expression of compassion from others

	0 - Don't agree at all	1	2 - Somewhat agree	3	4 - Completely agree
1. Wanting others to be kind to oneself is a weakness	○	○	○	○	○
2. I fear that when I need people to be kind and understanding they won't be	○	○	○	○	○
3. I'm fearful of becoming dependent on the care from others because they might not always be available or willing to give it	○	○	○	○	○

4. I often wonder whether displays of warmth and kindness from others are genuine	○	○	○	○	○
5. Feelings of kindness from others are somehow frightening	○	○	○	○	○
6. When people are kind and compassionate towards me I feel anxious or embarrassed	○	○	○	○	○
7. If people are friendly and kind I worry they will find out something bad about me that will change their mind	○	○	○	○	○
8. I worry that people are only kind and compassionate if they want something from me	○	○	○	○	○
9. When people are kind and compassionate towards me I feel empty and sad	○	○	○	○	○

10. If people are kind I feel they are getting too close	○	○	○	○	○
11. Even though other people are kind to me, I have rarely felt warmth from my relationships with others	○	○	○	○	○
12. I try to keep my distance from others even if I know they are kind	○	○	○	○	○
13. If I think someone is being kind and caring towards me, I 'put up a barrier'	○	○	○	○	○

Scale 3: Expressing kindness and compassion towards yourself

	0 - Don't agree at all	1	2 - Somewhat agree	3	4 - Completely agree
1. I feel that I don’t deserve to be kind and forgiving to myself	○	○	○	○	○
2. If I really think about being kind and gentle with myself it makes me sad	○	○	○	○	○

3. Getting on in life is about being tough rather than compassionate	○	○	○	○	○
4. I would rather not know what being ‘kind and compassionate to myself’ feels like	○	○	○	○	○
5. When I try and feel kind and warm to myself I just feel kind of empty	○	○	○	○	○
6. I fear that if I start to feel compassion and warmth for myself, I will feel overcome with a sense of loss/grief	○	○	○	○	○
7. I fear that if I become kinder and less self-critical to myself then my standards will drop	○	○	○	○	○
8. I fear that if I am more self-compassionate I will become a weak person	○	○	○	○	○
9. I have never felt compassion for myself, so I would not know where to	○	○	○	○	○

begin to develop these feelings					
10. I worry that if I start to develop compassion for myself I will become dependent on it	○	○	○	○	○
11. I fear that if I become too compassionate to myself I will lose my self-criticism and my flaws will show	○	○	○	○	○
12. I fear that if I develop compassion for myself, I will become someone I do not want to be	○	○	○	○	○
13. I fear that if I become too compassionate to myself others will reject me	○	○	○	○	○
14. I find it easier to be critical towards myself rather than compassionate	○	○	○	○	○
15. I fear that if I am too compassionate towards myself, bad	○	○	○	○	○

things will happen	

Self-Criticism and Self-Reassuring Scale

When things go wrong in our lives or don't work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of themselves.

Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and circle the number that best describes how much each statement is true for you.

	0 - Not at all like me	1 - A little bit like me	2 - Moderately like me	3 - Quite a bit like me	4 - Extremely like me
1. I am easily disappointed with myself	○	○	○	○	○
2. There is a part of me that puts me down	○	○	○	○	○
3. I am able to remind myself of positive things about myself	○	○	○	○	○
4. I find it difficult to control my anger and frustration at myself	○	○	○	○	○
5. I find it easy to forgive myself	○	○	○	○	○

6. There is a part of me that feels I am not good enough	○	○	○	○	○
7. I feel beaten down by my own self-critical thoughts	○	○	○	○	○
8. I still like being me	○	○	○	○	○
9. I have become so angry with myself that I want to hurt or injure myself	○	○	○	○	○
10. I have a sense of disgust with myself	○	○	○	○	○
11. I can still feel lovable and acceptable	○	○	○	○	○
12. I stop caring about myself	○	○	○	○	○
13. I find it easy to like myself	○	○	○	○	○
14. I remember and dwell in my failings	○	○	○	○	○
15. I call myself names	○	○	○	○	○
16. I am gentle and	○	○	○	○	○

supportive with myself					
17. I can't accept failures and setbacks without feeling inadequate	○	○	○	○	○
18. I think I deserve my self criticism	○	○	○	○	○
19. I am able to care and look after myself	○	○	○	○	○
20. There is a part of me that wants to get rid of the bits I don't like	○	○	○	○	○
21. I encourage myself for the future	○	○	○	○	○
22. I do not like being me	○	○	○	○	○

Quality of Life

We are interested in your health status and the impact this has on different domains of your life.

	1- Excellent	2- Very good	3- Good	4- Fair	5- Poor
1. In general, would you say your health is:	○	○	○	○	○

	1- Much better now than one year ago	2- Somewhat better now than one year ago	3- About the same	4- Somewhat worse than one year ago	5- Much worse now than one year ago
2. Compared to one year ago, how would you rate your health in general now?	○	○	○	○	○

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	1- Yes, limited a lot	2- Yes, limited a little	3- Not, not limited at all
3. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	○	○	○
4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○	○	○
5. Lifting or carrying groceries	○	○	○
6. Climbing several flights of stairs	○	○	○
7. Climbing one flight of stairs	○	○	○

8. Bending, kneeling or stooping	○	○	○
9. Walking more than a mile	○	○	○
10. Walking several blocks	○	○	○
11. Walking one block	○	○	○
12. Bathing or dressing yourself	○	○	○

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities, as a result of your physical health?

	1- Yes	2- No
13. Cut down the amount of time you spent on work or other activities	○	○
14. Accomplished less than you would like	○	○
15. Were limited in the kind of work or other activities	○	○
16. Had difficulty performing the work or other activities (for example, it took extra effort)	○	○

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities, as a result of any emotional problems (such as feeling depressed or anxious)?

	1- Yes	2- No
17. Cut down the amount of time you spent on work or other activities	○	○

18. Accomplished less than you would like	○	○
19. Didn't do work or other activities as carefully as usual	○	○

	1- Not at all	2- Slightly	3- Moderately	4- Quite a bit	5- Extremely
20. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?	○	○	○	○	○

	1- None	2- Very mild	3- Moderate	4- Severe	5- Very severe
21. How much bodily pain have you had during the past 4 weeks?	○	○	○	○	○

○

	1- Not at all	2- Slightly	3- Moderately	4- Quite a bit	5- Extremely
22. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?	○	○	○	○	○

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

	1- All of the time	2- Most of the time	3- A good bit of the time	4- Some of the time	5- A little of the time	6- None of the time
23. Did you feel full of pep?	○	○	○	○	○	○
24. Have you been a very nervous person?	○	○	○	○	○	○
25. Have you felt so down in the dumps that nothing could cheer you up?	○	○	○	○	○	○
26. Have you felt calm	○	○	○	○	○	○

and peaceful?						
27. Did you have a lot of energy?	○	○	○	○	○	○
28. Have you felt downhearted and blue?	○	○	○	○	○	○
29. Did you feel worn out?	○	○	○	○	○	○
30. Have you been a happy person?	○	○	○	○	○	○
31. Did you feel tired?	○	○	○	○	○	○
32. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives etc)?	○	○	○	○	○	○

How TRUE or FALSE is each of the following statements for you.

	1- Definitely true	2- Mostly true	3- Don't know	4- Mostly false	5- Definitely false

33. I seem to get sick a little easier than other people.	○	○	○	○	○
34. I am as health as anybody I know.	○	○	○	○	○
35. I expect my health to get worse.	○	○	○	○	○
36. My health is excellent.	○	○	○	○	○

Anxiety Questionnaire

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	0- Not at all	1- Several days	2- More than half the days	3- Nearly every day
1. Feeling nervous, anxious or on edge	○	○	○	○
2. Not being able to stop or control worrying	○	○	○	○
3. Worrying too much about different things	○	○	○	○
4. Trouble relaxing	○	○	○	○
5. Being so restless that it is hard to sit still	○	○	○	○

6. Becoming easily annoyed or irritable	○	○	○	○
7. Feeling afraid as if something awful might happen	○	○	○	○

Depression Questionnaire

If you are affected by any of the questions in the questionnaires, are concerned about your mental health or you notice any distress whilst taking part in the study, please contact any of the following services:

Your GP NHS 111 (option 2) Samaritans on 116 123

If you are in crisis or experience a medical emergency, please call 999 or attend your local A&E department

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	0- Not at all	1- Several days	2- More than half the days	3- Nearly every day
	○	○	○	○
1. Little interest or pleasure in doing things	○	○	○	○
2. Feeling down, depressed or hopeless	○	○	○	○
3. Trouble falling or staying asleep, or sleeping too much	○	○	○	○

4. Feeling tired or having little energy	○	○	○	○
5. Poor appetite or overeating	○	○	○	○
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	○	○	○	○
7. Trouble concentrating on things, such as reading the newspaper or watching television	○	○	○	○
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	○	○	○	○
9. Thoughts that you would be better off dead or of hurting yourself in some way	○	○	○	○

Health Questionnaire

Please indicate how you are feeling now, or how you have been feeling over the last few days by choosing the answer to each of the following items

	Yes, definitely	Yes, sometimes	No, not so much	No, not at all
	○	○	○	○
1. I wake early and then sleep badly for the rest of the night	○	○	○	○
2. I get very frightened or panic feelings for apparently no reason at all	○	○	○	○
3. I feel miserable and sad	○	○	○	○
4. I feel anxious when I go out of the house on my own	○	○	○	○
5. I have lost interest in things	○	○	○	○
6. I get palpitations or a sensation of "butterflies" in my stomach or chest	○	○	○	○
7. I still enjoy the things I used to	○	○	○	○
8. I feel life is not worth living	○	○	○	○
9. I feel tense or "wound up"	○	○	○	○

10. I have a good appetite	○	○	○	○
11. I have headaches	○	○	○	○
12. I feel more tired than usual	○	○	○	○
13. I have dizzy spells	○	○	○	○
14. I suffer from backache or pain in my limbs	○	○	○	○
15. I have hot flushes	○	○	○	○
16. I am more clumsy than usual	○	○	○	○
17. I feel sick or nauseous	○	○	○	○
18. I have feelings of well-being	○	○	○	○
19. I suffer from night sweats	○	○	○	○
20. I have difficulty in getting off to sleep	○	○	○	○
21. I feel physically attractive	○	○	○	○
22. I have difficulty concentrating	○	○	○	○
23. My memory is poor	○	○	○	○

If you are currently having menstrual periods (naturally or with Hormone Replacement Therapy), please indicate how you have been feeling when you had your last menstrual period, by choosing the answer to each of the following items

	Yes, definitely	Yes, sometimes	No, not so much	No, not at all
1. My breasts feel tender or uncomfortable	○	○	○	○
2. I have abdominal cramps or discomfort	○	○	○	○
3. I have heavy periods	○	○	○	○
4. My stomach feels bloated	○	○	○	○

You have now reached the end of the questionnaires - thank you for taking the time to complete these! If you have any questions, please contact a member of the research team: Simone Saidel - Kate Robinson –

If you are affected by any of the questions in the questionnaires, are concerned about your mental health or you notice any distress whilst taking part in the study, please contact any of the following services:

Your GP NHS 111 (option 2) Samaritans on 116 123

If you are in crisis or experience a medical emergency, please call 999 or attend your local A&E department

B13. Email template for allocation to group 1

Dear [INSERT NAME],

Following randomisation, we're pleased to let you know that you have been allocated to the intervention group which is Group 1 running on Wednesdays between 6:00pm-7:30pm:

Session 1 - 31st July 2024
Session 2 - 7th August 2024
Session 3 - 14th August 2024
Session break - 21st August 2024
Session 4 - 28th August 2024
Session break - 4th September 2024
Session 5 - 11th September 2024
Session 6 - 18th September 2024

Below you will find the link to join the first group on the 31st July 2024 at 6:00pm. This will be via MsTeams:
[INSERT LINK]

If you have any questions, please do not hesitate to get in contact with a member of the research team.

All the best,
Simone and Kate

B14. Email template for allocation to group 2

Dear [INSERT NAME],

Following randomisation, we're pleased to let you know that you have been allocated to the intervention group which is group 2 that will run on Fridays from 9:30am-11:00am:

Session 1 - 2nd August 2024
Session 2 - 9th August 2024
Session 3 - 16th August 2024
Session break - 23rd August 2024
Session 4 - 30th August 2024
Session break - 6th September 2024
Session 5 - 13th September 2024
Session 6 - 20th September 2024

Below you will find the link to join the first group on the 2nd August 2024 at 9:30am. This will be via MsTeams: [INSERT LINK]
If you have any questions, please do not hesitate to get in contact with a member of the research team.

All the best,
Simone and Kate

B15. Email template for allocation to control group

Dear [INSERT NAME],

Following randomisation, you have been allocated to the non-intervention group. This means we will contact you again via email in 9 weeks to complete the final set of questionnaires and you will have the opportunity to take part in a post study interview.

As a reminder, all participants taking part in the research study will be provided access to the intervention materials at the end of the study.

We thank you again for participating and if you have any questions, please do not hesitate to get in contact with a member of the research team.

All the best,
Simone and Kate

B16. Post-intervention demographic questions

There were six demographic questions missing at baseline, therefore these were included in the post-intervention outcome measure pack.

What region of the UK are you based in?

- ○ London
- ○ North East
- ○ North West
- ○ Yorkshire
- ○ East Midlands
- ○ West Midlands
- ○ South East

- ○ East of England
- ○ South West
- ○ Scotland
- ○ Wales Northern
- ○ Ireland

What is your current employment status?

- ○ Full time
- ○ Part time
- ○ Self-employed
- ○ Student
- ○ Unemployed
- ○ Unemployed (receiving benefits)
- ○ Retired
- ○ Prefer not to say

What is your occupation?

_____

What is your highest education background?

- ○ Secondary school up to 16 years (e.g. O-Levels, GCSE)
- ○ Higher or secondary or further education (e.g. A-Levels, BTEC)
- ○ College or University
- ○ Post-graduate degree (e.g. Masters)
- ○ Doctoral degree
- ○ Prefer not to say

Are you taking contraception?

- ○ Copper coil
- ○ Hormonal coil
- ○ Combined pill
- ○ Progesterone only pill (the mini pill)
- ○ Contraceptive patch
- ○ Depo injection (depo-provera)
- ○ Implant
- ○ Not applicable

If you are taking contraception, how long have had this/been taking this for?

- ○ Less than 6 months
- ○ More than 6 months

Appendix C

Joint thesis declaration

This thesis was a joint project with Kate Robinson (KR). KR conducted a qualitative analysis of participants' experiences of partaking in the Compassionate Mind Training group intervention and being involved in the study.

Literature review: KR was involved as a second screener at the point of title and abstract screenings, and full text screenings. Rebecca Hardy performed the meta-analysis, and data was interpreted by the author. The systematic review and meta-analysis was written solely by the author.

Empirical paper: Several elements of the empirical study were conducted jointly with KR. These were: 1) selecting outcome measures, 2) completing the ethics application, 3) creating the interview schedule for focus groups, 4) developing recruitment and additional study materials (e.g. participant information sheet, consent form, recruitment posters), 5) editing intervention materials, 6) co-facilitating study focus groups, 7) co-facilitating the delivery of the CMT intervention, 8) individually facilitating qualitative feedback interviews with participants. The author reviewed the interview schedule developed by Kate. The author was solely responsible for the evaluation of feasibility and acceptability, and conducting the statistical analyses. The author was also solely responsible for the write up of the empirical paper.

The current author, Simone Saidel (SS) and KR, were supported by other researchers in the thesis process. Contributions are summarised below:

Table C1

Researcher contributions to the thesis

Task	**Contributor**
Literature review	

Literature search strategy development and search	SS
Paper screenings (title and abstract, full text)	SS, with 10% of papers at each stage screened by KR
Risk of bias assessments	SS, with 50% reviewed by Lexi He (LH) (PhD student)
Data extraction	SS, with study characteristics reviews by LH
Statistical synthesis	RH
Write up of paper	SS
Empirical paper	
Design of empirical study	SS and KR, under the supervision of Professor Aimee Spector (AS) (internal supervisor) and Dr. Helen Donovan (HD) (external supervisor)
Ethics application	SS and KR
Design of intervention	HD, under the supervision of Dr. Chris Ions
Development of study materials (recruitment posters, information sheets, consent forms, questionnaire packs, intervention session materials)	SS and KR
Development, recruitment and delivery of focus groups	SS and KR
Recruitment	SS and KR
Delivery of CMT	SS and KR
Development of semi-structured feedback interview schedule	KR, reviewed by AS, SS and HD
Facilitation of interviews	Led by KR and SS, assisted by Liya Shina (LS) (MSc student) and Dominika Valacsay (MSc student)
Data entry and storage	SS and KR
Data cleaning	SS, assisted by LS
Data analysis	SS
Write up	SS