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Yoga and its Transdiagnostic Applications

Volume 1 of 1

by

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University of Southampton

Abstract

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Yoga, an ancient practice originating in India, has been gaining popularity in the West and has sparked interest in the world of research. Chapter 1 presents a rationale for the thesis and its overarching aim, which was to explore whether yoga has the potential to offer psychological benefits across different populations. This would subsequently help to inform the decision on whether further investigation into yoga as an alternative to talking therapies is warranted. The researcher's reflections are included in this chapter.

Chapter 2 presents a systematic review and narrative synthesis which aimed to explore the impact of yoga on self-compassion amongst young people. Eight studies were included in the review however, the lack of rigour across study designs meant that causality could not be determined. Nevertheless, the results indicate a positive trend in self-compassion thus further exploration is warranted. Future research should adopt more rigorous study designs to allow for causal inference.

Chapter 3 presents a feasibility study of a Hatha yoga intervention for the post-bariatric surgery population ($n = 40$). The study explored participant experiences of the intervention and within-subject changes in body compassion, weight self-stigma, emotion regulation, and intuitive eating. The findings suggest that the intervention was experienced as acceptable and beneficial, and they provide preliminary support for the proposed pathways of change in yoga, applied to the post-bariatric population. Follow-up research is therefore warranted, and more rigorous study designs are needed to enable comparison in outcomes between yoga and traditional talking therapies.

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Research Thesis: Declaration of Authorship

Print name: Daria Stephani

Title of thesis: Yoga and its Transdiagnostic Applications

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature: Date: 19/08/2025

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Chapter 1 Introduction

1.1 Aims and rationale of the thesis

Current theories posit that yoga may target transdiagnostic psychological processes (core psychological mechanisms involved in different mental health disorders), making it a promising intervention to study due to its potential applicability across a range of populations (Bennetts, 2022; Gard et al., 2014; Kishida et al., 2018). The main aim of this thesis was to explore whether yoga has the potential to offer psychological benefits across different populations in order to help determine whether further exploration of yoga as an alternative to talking therapies would be warranted.

Existing research shows that yoga practice is associated with improvements in various symptoms such as those of depression and anxiety (Pascoe & Bauer, 2015), stress (Wang & Szabo, 2020), and chronic back pain (Cramer et al., 2013). However, findings need to be interpreted with caution due to the lack of rigor in yoga research which is partly attributable to the infancy of the field (Park & Slattery, 2021). There are high levels of heterogeneity amongst studies, and the reporting of yoga research often lacks detail which affects study replication and limits our ability to implement clinical applications (Moonaz et al., 2021). Subsequently, Delphi-based, CheckList stAndardising the Reporting of Interventions For Yoga (CLARIFY) guidelines have been published to aid in the reporting of all yoga research (Ward et al., 2022) (Appendix A).

Yoga is an ancient practice which originated in India, and it involves following an eight-fold path which leads to “a bliss state” (Alam et al., 2024). The path contains eight limbs of yoga which include yamas (universal ethics), niyamas (individual ethics), asanas (physical postures), pranayama (breath control), pratyahara (control of senses), dharana (concentration), dhyana (meditation), and samadhi (pure consciousness). During yoga practice, the limbs develop in succession of one another where the yamas and niyamas are considered the philosophical foundation of life, the asanas and pranayama physical practices to prepare the body for the latter stages, and pratyahara, dharana, dhyana, and samadhi are practices for the attainment of the bliss state (Alam et al., 2024; Hartranft, 2003). Please see Table 1 for a definition of each limb.

Table 1.1

Definitions of the eight limbs of yoga (Bennetts, 2022; Fox et al., 2024; Schmidt et al., 2021)

Limb	Yamas	Niyamas	Asanas	Pranayama	Pratyahara	Dharana	Dhyana	Samadhi
Definition	Ethical guidance for interpersonal and intrapersonal behaviour.	Ethical teachings which provide guidance for daily life.	Movements through the physical postures of yoga which are aimed at strengthening the body and preparing it for the latter limbs of yoga.	Breath regulation which serves to regulate physiological systems to increase awareness of one's internal bodily states.	Brining attention inwards.	Concentrating attention on a single object.	A deep meditative state in which the mind becomes as one, connected with the object of dharana.	Connecting to the divine and experiencing a bliss state.
Yamas: sub-limb	Ahimsa	Satya	Asteya	Brahmacharya	Aparigraha			
Definition	Observing “non-violence” and compassion towards oneself and others.	Honesty and truthfulness.	“Not stealing” which includes the criminal act, and the act of taking away emotions and experiences from ourselves and others.	Regulation of energy, ceasing of overindulgence and a responsible use of resources.	“Non-possessiveness” over situations, physical sensations, and inner experiences.			

Chapter 1

Niyamas: sub-limb	Saucha	Santosha	Tapas	Svadyaya	Ishvara pranidhana
Definition	“Cleanliness and purity” of one’s environment, body, and mind.	Being content with things as they are.	“Self-discipline” which relates to being willing to do the work in order to learn.	“Self-study” which includes one’s habits, thoughts, behaviours, and physiological states.	“Surrendering” to the higher power through relinquishing the ego and concern with the self.

Although existing research suggests that yoga is associated with a wide range of benefits, there is a lack of research into the underlying mechanisms responsible for these observations. Theoretical models have aimed to explain how yoga yields psychological benefits; one theory comes from Gard et al. (2014) who argue that yoga practice facilitates bidirectional feedback between high and low-level brain networks and viscerosomatic processing whereby maladaptive outputs (rumination, emotional reactivity, pain etc.) are extinguished and replaced by more adaptive outputs such as cognitive flexibility, impulse control, and a desire to engage in health-promoting behaviour. The integration of the systems is argued to improve the accuracy of detecting and efficiently responding to perceived threats thus reducing the consequences of prolonged stress exposure (Gard et al., 2014).

Kishida et al. (2018) build on Gard et al.'s theory (Gard et al., 2014) by arguing that yoga also improves intrapersonal and interpersonal relationships through cultivating mindfulness and compassion which subsequently lead to enhanced health and wellbeing. Although both models consider transdiagnostic processes involved in yoga practice (mechanisms which apply across different diagnostic categories), they could be considered reductionist as they combine the eight limbs of yoga into four groups (ethical precepts, physical postures, breath regulation, and meditation). Furthermore, they do not consider how each of the eight limbs targets the different psychological processes thus making it difficult to compare yoga to psychological interventions meaning that the quality of research remains poor.

In light of this, Bennetts (2022) developed a model which illustrates the psychological processes which are posited to be targeted by each yoga limb (Table 2). The model stipulates that the psychological processes which are targeted by yoga are also targeted by third wave psychological therapies such as Acceptance and Commitment Therapy (ACT) and Compassion Focused Therapy (CFT), both of which have been found to have a positive impact on psychological wellbeing in clinical populations (Craig et al., 2020; Stenhoff et al., 2020). Bennetts argues that yoga can now be compared to psychological therapies in controlled clinical trials which could have a beneficial impact on the commissioning of yoga into clinical practice (Bennetts, 2022). There is preliminary support for the model (Pick, 2021) however, empirical evidence is of poor quality and higher quality research is need.

Table 1.2*Breakdown of Transdiagnostic Processes and Proposed Associated Yoga Limb (Bennetts, 2022)*

Yoga Limb	Ahimsa	Satya	Asteya	Brahmacharya	Aparigraha	Saucha	Santosha
Relevant	Compassion	Emotion regulation	Emotion regulation	Emotion	Cognitive fusion	Compassion	Emotion regulation
Transdiagnostic	Self-criticism	(awareness/	(awareness/	regulation	(opposing)	Emotion regulation	(awareness/acceptance
Process	(opposing)	acceptance)	acceptance and	(action/coping)	Emotion regulation	(awareness/acceptance	and action/coping)
	Imagery	Interoception	action/ coping)	Sleep	(action/coping)	and action/coping)	Cognitive fusion
			Interoception		Compassion	Interoception	(opposing)
					Imagery		Compassion
							Interoception
Yoga Limb	Tapas	Svadhyaya	Svadhyaya	Asana	Pranayama	“Meditation” (pratyahara, dharana, dhyana)	Samadhi
Relevant	Motivation	Emotion regulation	Emotion regulation	Physiological	Physiological systems	Imagery	Compassion
Transdiagnostic	Frequency	(awareness/	(awareness/	systems	Interoception	Attention	Sleep
Process	markers of other	acceptance and	acceptance)	Interoception	Emotion regulation	Compassion	Emotion regulation
	transdiagnostic	action/coping)		Sleep	(awareness/acceptance	Emotion regulation	(awareness/acceptance
	processes	Compassion		Interpersonal	and action/coping)	(awareness/acceptance)	
		Interoception		factors	Sleep		
				Imagery	Cognitive fusion		
					Interpersonal factors		

The population chosen for the systematic review paper was young people; mental health difficulties amongst young people have been on the increase in the UK (NHS England, 2023) and they have been associated with negative long-term psychosocial impacts (Schlack et al., 2021). Unfortunately, young people face difficulties accessing mental health services, with one of the major reasons being service delays associated with a lack of resources (Colizzi et al., 2020). Young people also report not feeling confident to access services, citing an inability to verbalise difficulties and worries about disclosing personal information to a person they don't know well, as some of the barriers (Radez et al., 2021). Early intervention is argued to be crucial to prevent long-term difficulties, and there is a push for transdiagnostic models of care to increase access to early support (Colizzi et al., 2020).

The population chosen for the empirical project was a post-bariatric surgery population; although bariatric surgery can be an effective weight loss method for many people living in larger bodies, research shows that others continue to struggle with body image, emotion regulation difficulties, disordered eating and associated weight regain (Barbuti et al., 2021; Tolvanen et al., 2022). As is the case with young people, some adults also find it difficult to access talking therapies for fear of judgement, difficulties with expressing their concerns, and language barriers (Alam et al., 2024; Salaheddin & Mason, 2016).

1.2 Ontology and epistemology

The development of this thesis was influenced by pragmatism which seeks to understand the human experience and is motivated to create positive practical change (Hammond, 2017). It refers to a worldview that focuses on “what works” rather than seeking the objective “truth” (Weaver, 2018). As such, pragmatic research aims to identify a problem within society, and it seeks to better understand it through the use of methods which best suit the research question. Pragmatic research is action-oriented therefore, findings are used to propose practical solutions to improve human experience (Duram, 2010).

The systematic review question was informed by the researcher's clinical experience and subsequent review of existing literature, both of which indicate that there is an increasing number of young people who are struggling with their mental health and not all of them are able to access mental health services (Colizzi et al., 2020; NHS England, 2023; Radez et al., 2021). A literature review into young people's mental health revealed that compassion is one of the mechanisms which has been posited to have a positive impact on young people's wellbeing, and it has been suggested that it should be a target in treatment (Egan et al., 2022). Subsequently, the researcher sought to investigate whether yoga could improve self-compassion amongst young people. The research question lent itself well to quantitative

methodology however, instead of focusing on trying to find an objective truth, the researcher was interested in the real-world applications of the findings. Pragmatism states that knowledge is fallible (Kaushik & Walsh, 2019) therefore, the conclusions are made tentatively, and future research recommendations are proposed.

The empirical paper was also informed by the researcher's clinical experience and a review of existing literature, both of which suggest that bariatric surgery, on its own, does not appear to target the underlying psychological mechanisms involved in the maintenance of distress amongst the bariatric population (Barbuti et al., 2021; Tolvanen et al., 2022). A review of existing research suggests that there are several maintenance mechanisms including weight self-stigma, emotion dysregulation, and emotional eating (Barbuti et al., 2021; Gastón-Panthaki et al., 2023; Tolvanen et al., 2022). The empirical study was therefore interested in exploring whether yoga could be a feasible intervention for this population. The study utilised mixed methodology which is favoured by pragmatists as it helps to create a holistic understanding of the research problem (Duram, 2010). The findings of the study and the voices of participants were used to shape the recommendations for future research.

1.3 Reflexivity and axiology

It is important to acknowledge my own values and interests which influenced this thesis. Firstly, the reason behind focusing on yoga as an intervention of interest was influenced by personal experience of, and an interest in, yoga practice. I started to practice yoga during the COVID-19 pandemic; I did not know much about yoga prior to this however, I heard that it could have a beneficial impact on wellbeing therefore, I chose to try it as I was keen to look after myself during this difficult time. I soon noticed beneficial effects on my stress levels, my mobility and strength, and my general wellbeing which encouraged me to continue to practice yoga regularly, and to this day.

I was also struck by the similarities between yoga and third wave therapy approaches as both emphasise acceptance and compassion. As a clinician, I value integrative practice which allows me to draw upon different approaches thus tailoring the intervention to the individual. I also place importance on the development of compassion therefore, yoga aligns with my values.

As a clinician, I value inclusivity and early intervention, and the populations which were chosen for this thesis were influenced by my experiences in clinical settings. During my time on a clinical placement in a Child and Adolescent Mental Health Service (CAMHS) I was struck by the length of waiting times for support which, for some young people, were years long. Some young people were not even seen as they turned 18 years old therefore, their care was

subsequently transferred to the adult services which had their own waiting lists. Current statistics reveal that 40,000 children in England are waiting at least two years to receive support from mental health services (Children's Commissioner, 2024). I am, therefore, keen to explore whether yoga has the potential to improve self-compassion amongst young people with the hope that findings would inspire follow-up research into yoga's potential to act as an alternative to talking therapies. This could increase access to support for young people, and it could subsequently ease pressure on secondary mental health services.

I also chose to focus on the post-bariatric surgery population as my previous role at an Adult Eating Disorder Service exposed me to the difficulties that this population can face. Many people discussed that they continued to struggle with the difficulties they experienced prior to surgery however, they found it hard to access mental health support due to the stigma attached to living in a bigger body. Research has found that some GPs continue to hold negative attitudes towards people who are living in bigger bodies, viewing them as unmotivated and non-compliant, which results in reduced efforts to offer support (Teixeira et al., 2015). My aim was to explore whether yoga could be a more accessible support option for this population.

It is important to acknowledge that one of the supervisors for this thesis is a trained yoga teacher and the other has personal experience of bariatric surgery. I am aware that our combined experiences would have influenced my predictions about the possible outcomes of both papers however, I ensured to strictly adhere to the research protocols which were reviewed by researchers from the university who were not linked to the project therefore, my analytical decisions were not swayed by personal biases. I am aware, however, that the interpretation of findings and the conclusions drawn may have been influenced by these biases. On the other hand, having insider knowledge is argued to be advantageous as it allows researchers to contextualise participants' nuanced perspectives and lived experiences that may otherwise be overlooked or misrepresented (Aguilar et al., 2025).

An interesting finding from the empirical study which merits reflection is that participants who were male, and people from ethnic minority backgrounds, preferred to have their cameras turned off during the interviews. The only participants who switched their cameras on were White females. There currently appears to be no research into this thus the reasons behind this can only be speculated. One potential reason could be due to the researcher being a White female which could have impacted how much the participants felt they could relate. This finding should be followed up in future research to help us understand the potential reasons behind this trend which would help to place us in a better position to be able to advise on possible adaptations.

It was also noticed that interview times were shorter for male participants compared to female participants. This finding is in line with previous research which demonstrated that female interviewees tended to provide extended responses, and they engaged in interactional feedback whereas men's responses tended to be more minimal (Manderson et al., 2006). Nevertheless, this research helped to give a voice to men (who made up most of the interview sample) who tend to otherwise be underrepresented in qualitative research (Affleck et al., 2013).

1.4 Dissemination plan

The two research papers have been written with the intention of being published in an internationally peer-reviewed journal of Complementary Therapies in Clinical Practice (the guide for authors is attached in Appendix B). The journal consists of peer reviewed papers which provide evidence for the efficacy of complementary therapies, and which address the implementation of complementary therapies in clinical settings internationally. The papers in the journal are of interest to all members of the healthcare profession.

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Chapter 2 Literature Review Paper

Does Yoga Improve Self-Compassion Amongst Young People? A Systematic Review

Journal Specification: The following paper has been prepared for submission to the journal of Complementary Therapies in Clinical Practice. The guidelines for authors are provided in Appendix B.

Word Count: 6,963

Abstract

Background and Purpose

A large percentage of young people struggle with their mental health and research shows that self-compassion is one of the key mechanisms involved in the improvement of psychological distress. Existing theories posit that yoga targets self-compassion therefore, the aim of the review was to explore whether existing yoga research reports an improvement in self-compassion amongst young people.

Methods

A systematic search was conducted using the following databases: AMED, APA PsycArticles, APA PsycInfo, CINAHL, MEDLINE, Cochrane Library, PubMed, EMBASE, and Web of Science Core Collection. The searches were run in November 2024, and they were re-run in March 2025. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. The methodological quality of the studies was reviewed using the Effective Public Health Practice Project (EPHPP) assessment tool. Report of the findings was informed by the synthesis without meta-analysis in systematic reviews (SWiM) guidelines.

Results

Eight studies were included in the review however, due to a lack of methodological rigour, it was not possible to infer causality. Nevertheless, the results indicated a positive trend in self-compassion thus warranting further empirical exploration. Future research should employ more rigorous study designs which could enable inference of causality.

Conclusion

A positive trend in self-compassion was found amongst the papers reviewed however, more rigorous research is needed to determine causality. In the meantime, the present findings suggest that yoga-based interventions may hold promise as a complementary approach to mental health support for young people.

Keywords: Yoga, Young people, Self-compassion, Alternative therapy, Psychology, Mental health

2.1 Introduction

The number of children and young people (CYP) accessing support for mental health difficulties in the UK has doubled since 2019 (NHS England, 2023), and almost a quarter of CYP in the UK describe their mental health as either “*bad*” or “*the worst it has ever been*” (Braithwaite & Phillips, 2024). Mental health difficulties are the leading cause of health-related disabilities amongst CYP in the UK (Public Health England, 2016).

Risk factors for the development of mental health difficulties amongst CYP include exposure to adversity, pressure to conform to peers, exploration of identity, and pressure to achieve at school (Ridley, 2003; WHO, 2024). It has been suggested that the gap between internalised expectations driven by external performance pressure (academic, social, etc.), and a lived reality which does not measure up to these expectations, could cause feelings of failure and negative self-perception amongst young people (Jacobsen & Nørup, 2020).

Mental health difficulties in CYP are associated with long-term impaired mental health, lower life satisfaction, and poorer health-related quality of life (Schlack et al., 2021). They have also been linked to poorer educational outcomes (Mojtabi et al., 2015) and lower socioeconomic status (Goodman et al., 2011). Subsequently, it is argued that early intervention is crucial to improve long-term outcomes (Callaghan et al., 2017).

Self-compassion has been found to be an active ingredient in the treatment and prevention of anxiety and depression amongst young people (Egan et al., 2022). Self-compassion “*involves being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s suffering and to heal oneself with kindness. Self-compassion also involves offering nonjudgmental understanding to one’s pain, inadequacies and failures, so that one’s experience is seen as part of the larger human experience*” (Neff, 2003a, p. 87).

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Neff (2003a) argues that self-compassion is made up of three components: self-kindness, common humanity, and mindfulness. Self-kindness refers to the ability to be kind and understanding toward oneself in instances of pain or failure. Common humanity is the ability to view one's experiences as part of the larger human experience rather than seeing them as separating and isolating, and mindfulness refers to the ability to hold painful thoughts and feelings in balanced awareness. These three components interact, and mutually engender one another; the non-judgemental, detached stance of mindfulness can lessen self-criticism and subsequently help to experience self-kindness which means that the impact of negative emotions will be lessened, making it easier to maintain balanced awareness (mindfulness). Additionally, acknowledging that painful experiences are shared with others can minimise self-blame which can subsequently reduce feelings of uniqueness and isolation (Neff, 2003b).

Neff (2003b) developed the Self-Compassion Scale (SCS) which measures the three components of self-compassion on separate subscales. The subscale scores are summed to create a total score which represents the overall level of self-compassion. The measure has been shown to be valid and reliable, and preliminary results indicated that self-compassion was linked to positive mental health outcomes such as lower levels of depression and anxiety, and greater life satisfaction (Neff, 2003b).

Another theory of compassion comes from Gilbert who defines compassion as “*a sensitivity to suffering in self and others, with a commitment to try to alleviate and prevent it*” (Gilbert, 2014, p. 19). This means turning towards the suffering and engaging with it rather than avoiding it, whilst also having the intention to learn how to alleviate and prevent suffering, and acting on this knowledge (Gilbert, 2015). Gilbert believes that compassion can be developed in therapy and that it can subsequently help with emotion regulation (Gilbert, 2015). Using the neurophysiology of emotion, Gilbert argues that humans possess three types of emotion regulation systems: threat and protection systems; drive, resource-seeking and excitement

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systems; and contentment, soothing and safeness systems. It is believed that psychological distress is the result of the three systems becoming unbalanced (Gilbert, 2014). The goal in therapy is to create balance between the three systems through increasing the activity of the soothe system by practicing compassion (Gilbert, 2009). Gilbert argues that compassion can “flow” in three directions: the compassion we feel for others, the compassion we feel coming from others towards ourselves, and the compassion we direct towards our selves (self-compassion) (Gilbert, 2014).

Self-compassion has been gaining popularity in the literature, and it is Neff’s theory of compassion and the associated SCS (Neff, 2003a; Neff, 2003b) which are predominantly used to conceptualise and measure self-compassion. This has been criticised due to self-compassion being a complicated, multi-faceted construct, and there are fears that solely using one conceptualisation means that the pathways by which self-compassion works to benefit the self and others remain unclear (Cha et al., 2023). Additionally, there are concerns regarding the positive and the negative subscales of the SCS which are very different in nature, with the negative subscale being associated with psychopathology. Subsequently, it is advised that caution is applied to the total score of the SCS as it could result in an inflated relationship between self-compassion and psychopathology (Muris et al., 2018).

Nevertheless, self-compassion has been associated with lower levels of depression, anxiety, and stress amongst young people (Thomas & Thenmozhi, 2019), and higher levels of wellbeing (Neff & McGehee, 2010). It has also been found that self-compassion was positively associated with resilience and curiosity (Bluth et al., 2018). It has subsequently been recommended that self-compassion should be a target in treatment for young people to offer them new and healthy ways of coping with the challenges associated with life transitions with the aim of improving their emotional wellbeing (Bluth et al., 2018; Neff & McGehee, 2010; Thomas & Thenmozhi, 2019).

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Compassion Focused Therapy (CFT) is an evidence-based intervention aimed at improving compassion amongst people presenting with high levels of shame and self-criticism (Gilbert, 2014). A recent meta-analysis found CFT to be effective at improving compassion-based outcomes and clinical symptomology amongst a clinical sample (Millard et al., 2023). However, the included studies used adult samples and there is limited evidence of effectiveness of CFT amongst young people. Moreover, traditional talking therapies may not be suitable for everybody, and the most important barriers to seeking help have been found to be stigma and embarrassment, problems recognising symptoms, and a preference for self-reliance (Gulliver et al., 2010). This calls into question what alternative forms of therapy could be offered to those for whom talking therapies are undesirable.

Yoga has recently gained popularity in Western literature and its effects on mental health are increasingly studied. Some of the benefits of yoga have been found to include lower levels of perceived stress (Lindahl et al., 2016), lessened anxiety (Hofmann et al., 2016), improved physical health (Ross et al., 2013), and a cultivation of positive emotions including empathy, compassion, and emotion regulation (Patel et al., 2018). There is also emerging evidence which shows that yoga is associated with increased levels of self-compassion (Gard et al., 2012; Pick, 2021).

Yoga refers to the path to enlightenment, as outlined in the Yoga Sutras of Patanjali which is an ancient text of Indian philosophy (Bryant, 2015). It describes the eight-fold path of yoga intended to purify the practitioner's mind, body, and soul (Woods, 2012). The eight limbs of yoga are comprised of yamas (universal ethics), niyamas (individual ethics), asanas (physical postures), pranayama (breath control), pratyahara (control of senses), dharana (concentration), dhyana (meditation), and samadhi (pure consciousness). During yoga practice, the limbs flow into and complement one another as the practitioner progresses on their path to enlightenment (Sharma & Sharma, 2023).

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To understand the psychological processes involved in the enhancement of wellbeing during yoga practice, Gard et al. (2014) grouped the eight limbs of yoga into four categories which, they argue, act as tools for self-regulation and result in psychological and physical wellbeing. The “ethics” category includes yamas and niyamas, the “postures” category comprises of asanas, the “breath regulation” category includes pranayama, and the “meditation” category comprises of pratyahara, dharana, dhyana, and samadhi. Gard et al.’s (2014) theory states that there is bidirectional feedback between top-down and bottom-up processes whereby maladaptive cognitive (negative appraisal), emotional (emotional dysregulation), behavioural (rumination), and physiological (inflammation, muscle tension) outputs are replaced with more adaptive output through the ability to bring awareness to one’s experiences without judgement which subsequently results in reduced stress (Gard et al., 2014). The model has been criticised for grouping the eight limbs into four categories, and for the subsequent lack of exploration into the specific impact of each limb on psychological processes which makes it difficult to inform the design of yoga interventions for specific difficulties, and to compare it with talking therapies in clinical trials (Bennetts, 2022).

Another theoretical model of how yoga improves psychological wellbeing comes from Kishida et al. (2018) who propose that yoga generates calmness, mindfulness, and compassion, all of which enhance the relationship with oneself and others, subsequently resulting in increased wellbeing. Similarly to Gard et al. (2014), the authors do not explore the link between each yoga limb and the psychological processes that it may target. To address this gap, Bennetts (2022) proposed a model of yoga which depicts how each limb targets transdiagnostic processes involved in psychological wellbeing. The proposed processes are also targeted in third wave talking therapies (interoception, compassion, self-criticism, emotional regulation, attention, cognitive fusion, imagery, motivation, spirituality) which enables comparison between yoga and traditional talking therapies (Bennetts, 2022).

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Self-compassion is argued to be specifically targeted by the “yamas” and “niyamas” limbs which relate to the ethical principles of yoga (Bennetts, 2022; Gard et al., 2014). There is emerging evidence to support this, with the yamas limb being associated with higher levels of compassion and wellbeing amongst yoga practisers, with “ahimsa” (one of the five yamas) being the strongest predictor of compassion (Pick, 2021). Observing ahimsa requires being kind and considerate towards oneself and others (Bennetts, 2022) which are qualities that are comparable to the definitions of compassion proposed by Neff (2003) and Gilbert (2014) (Bennetts, 2022).

2.1.1 Purpose of the review

The purpose of this review was to explore whether yoga improves self-compassion amongst young people. The findings of this review may help determine whether further research into yoga as an alternative mental health support option for young people would be warranted.

2.2 Methods

This systematic review was informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) prior to data extraction (ID number: CRD42024620448).

2.2.1 Information sources and search strategy

A scoping search was performed via PROSPERO and EBSCO to assess the feasibility of the review. Once completed, the following online databases were systematically searched: AMED, APA PsycArticles, APA PsycInfo, CINAHL, MEDLINE (all accessed via EBSCO), Cochrane Library, PubMed, EMBASE (accessed via OVID) and Web of Science Core Collection (accessed

via Web of Science). The ProQuest online database was also systematically searched to identify relevant grey literature.

The search strategy was informed by key terms in the research question, scoping searches, and discussions with the supervisory team. Three sets of search terms were created to capture (1) yoga interventions, (2) self-compassion, and (3) young people. Please see Appendix C for the search terms and the search strategies used for each database. Boolean operators, truncation, and proximity searching were applied to yield the most appropriate results. A librarian was consulted for help in developing the search terms and search strategy. The searches were conducted for the period from the earliest date available in each database until the date of searches. Only studies available in the English language were included. The database searches were conducted in November 2024, and they were re-run in March 2025.

2.2.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria were informed by the PICOS strategy (Table 1).

Table 2.1*PICOS screening criteria*

	Patient population	Interventions	Comparators	Outcomes	Study design
Include	Participants with a mean age of 8-25 y/o	Yoga interventions must include a minimum of physical postures (asana) and either breath work (pranayama) or meditation	Any control group would be suitable, such as another form of treatment or treatment as usual.	Self-compassion as DV measured through SCS (Neff, 2003), SCS-SF (Raes et al., 2011) or SCS – Youth (Neff et al., 2021).	RCTs Quasi experimental studies Cohort studies Case series
Exclude	Participants with a mean age lower than 8 y/o or higher than 25 y/o	Interventions which do not include physical postures (asana) Interventions which include physical postures (asana) but do not include any of the other 2 aspects (breath work and meditation) Studies where yoga is an adjunct intervention to other treatments, and thus the effects could not be explored separately.	n/a	Self-compassion not measured as DV	Cross sectional designs Qualitative studies Reviews

Note. y/o = years old; n/a = not applicable; DV = dependent variable; SCS = Self-Compassion Scale; SCS-SF = Self-Compassion Scale Short-Form;

SCS-Youth = Self-Compassion Scale – Youth; RCTs = Randomised Controlled Trials.

2.2.3 Screening and study selection

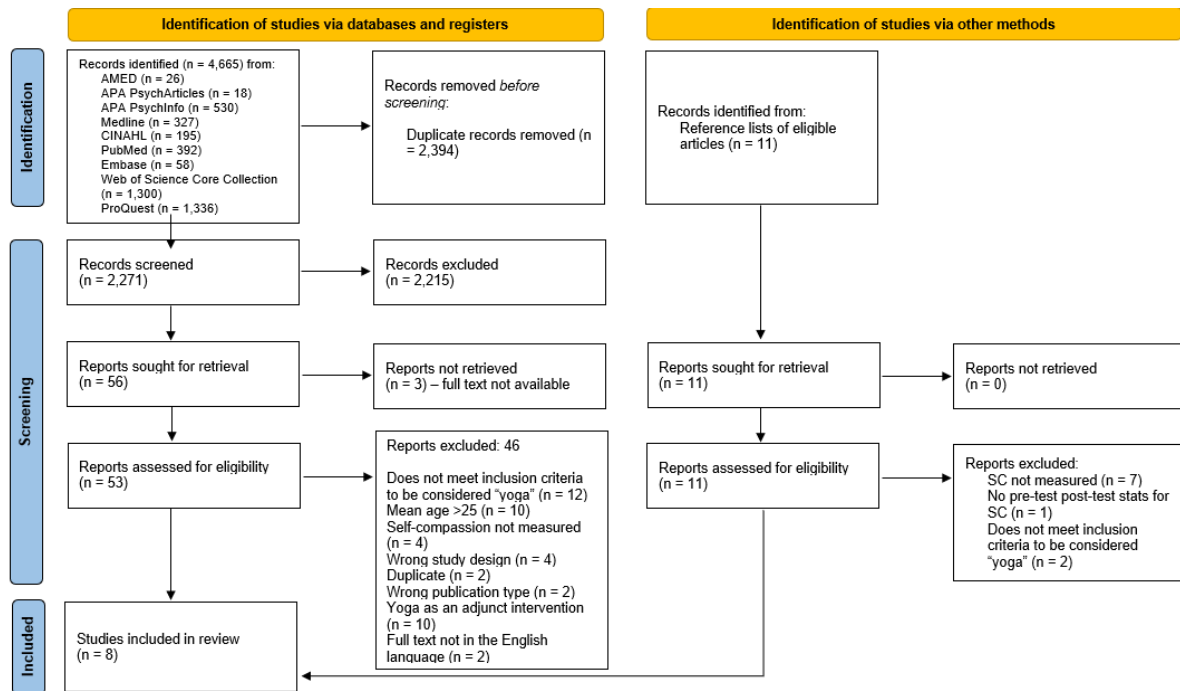
The screening process was informed by the PRISMA guidelines (Page et al., 2021).

Please see Figure 1 for the PRISMA flow diagram.

The searches were conducted for the period from the earliest date available in each database until the date of searches (November 2024), and only studies available in the English language were included. Overall, the searches returned 4,548 papers of which 2,339 duplicates were removed. Title and abstract screening resulted in 2,153 papers being removed based on the inclusion criteria. The remaining 56 papers were further assessed through full text screening and 49 papers were subsequently removed. References of eligible studies were searched for additional relevant articles and 11 studies were found. The papers were screened for eligibility which resulted in 10 papers being excluded and one paper being included.

The searches were re-run in March 2025 and 117 papers were found. After duplicates were removed, 62 papers were screened however, none of them met inclusion criteria. A total of eight papers were included in the final review.

A second reviewer blindly reviewed 10% of all studies at the title and abstract screening stage, and 17% of papers at the full-text screening stage. Following full-text screening, there was a 77.8% agreement between the reviewers, Cohen's $\kappa = 0.55$, which indicates moderate agreement (McHugh, 2012). Four out of the nine screened papers were deemed suitable by the second reviewer but unsuitable by the primary reviewer. These papers were taken for further discussion with the supervisory team and they were subsequently excluded for the following reasons: yoga was an adjunct intervention ($n = 1$), the paper did not clearly state whether physical postures were part of the intervention ($n = 3$).

Figure 2.1*PRISMA flow diagram (Page et al., 2021)*

Note. The diagram reflects the combined numbers of the initial search in November 2024 and the updated search in March 2025.

2.2.4 Data extraction

The following data was extracted from each included study: author and year of publication, journal, population, study design, type of yoga intervention, control group details, the self-compassion measure used, and summary of main findings (please see Table 2). The data extraction table was piloted, and the extracted data of 25% of the studies was checked at random by the second reviewer. There were no discrepancies.

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Table 2.2

Summary of study characteristics

Author(s); (Year); Journal	Country	Sample size	Mean age	Gender	Ethnicity	Prior experience of yoga	Study design	Duration of yoga intervention	Components of intervention	Control group	Measure of self-compassion (frequency of measurement)	Main findings	EPHPP score
Beck et al. (2017) American Journal of Speech-Language pathology	USA	20	20.95	Female	No data	4 participants 6 months – 2 years of experience	Quasi experimental, between-groups	8 x 20min	Physical postures Breath work Meditation 4 discussion topics Reflective writing	N = 17 mindfulness special interest group	SCS (pre-, mid-, and post-intervention)	Participation in the mindfulness sessions improved overall self-compassion, $F(1, 35) = 8.71, p < .05$.	3
Brandao et al. (2024) Journal of Health Psychology	Portugal	28	21.46	Female = 24 (85.7%) Male = 4 (14.4%)	No data	No data	RCT	6 x 60min	Physical Postures Breath work Meditation Chanting mantras	2 x control groups Active control ($n = 34$); Autogenic training 6 x 60min. Passive control ($n = 44$); no intervention.	SCS (pre- and post-intervention, and 1 month follow-up)	Self-compassion increased significantly in the experimental group from baseline to post-intervention $p < .01$, and from baseline to follow-up $p < .01$.	3
Cox et al. (2019) Body Image	USA	323	20.31	Female	White (78.9%) Black (1.9%) Native Hawaiian or Pacific Islander (0.3%) American Indian (0.3%) Asian (5.3%) More than one race (8.7%) “other” (2.8%)	No data	Within-subjects	32 x 75min	Physical postures Breath work Meditation	n/a	SCS (pre-, mid-, and post-intervention)	Significant positive change was found in self-compassion over the 16-week yoga course ($p < .05$).	3

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Author(s); (Year); Journal	Country	Sample size	Mean age	Gender	Ethnicity	Prior experience of yoga	Study design	Duration of yoga intervention	Components of intervention	Control group	Measure of self-compassion (frequency of measurement)	Main findings	EPHPP score
Erkin & Aykar (2021) Perspectives in Psychiatric Care	Turkey	47	18-21	Female	No data	Yes = 14.89%	Within-subjects	14 x 90min	Physical postures Breathwork Meditation Discussion themes	n/a	SCS (pre- and post-test)	There was a significant difference in the pre-test ($M = 3.22$, $SD = 0.69$) and post-test ($M = 3.59$, $SD = 0.53$) levels of self-compassion, $p = .001$.	3
Gard et al. (2012) The Journal of Positive Psychology	USA	53	22.06	Female (73%) Male (27%)	Caucasian (88%)	No data	Quasi experimental, between-subjects	4 months residential yoga-based programme. 3-5 hrs of daily practice.	Physical postures Breath work Meditation Daily course work Home practice encouraged	N = 48 No intervention	SCS (pre- and post-intervention)	Significant increase in self-compassion was found in the intervention group ($M = 3.26$, $SD = 0.65$) compared to the control group ($M = 2.80$, $SD = 0.68$), $t(72) = 2.9$, $p = .005$.	3
Karmer & Cuccolo (2020) Eating Disorders	USA	83	20	Females (77.8%) Males (22.2%)	Caucasian (90.1%) African American (2.5%) Hispanic (4.9%) American Indian (2.5%)	Yes (46.3%) No (53.8%)	Within-subjects	24 x 50min	Physical postures Breath work Meditation Yoga philosophy	n/a	SCS (pre- and post-intervention)	Self-compassion was higher at post-intervention compared to pre-intervention, $F = 6.73$, $p < .01$.	3
Kearns (2024) ProQuest (unpublished)	USA	42	9.7	Female (57.1%) Male (42.9%)	Hispanic/Latino (35.7%) Multiracial (26.2%) White (23.8%) Black (2.4%) Asian (2.4%) Did not answer (9.5%)	No data	Within-subjects	8 x 20min	Chair Yoga Physical postures Breath work Meditation Discussion topics	n/a	SCS-Youth (pre- and post-intervention)	Self-compassion scores were not significantly higher on the post-test ($M = 3.05$, $SD = 0.79$) than the pre-test ($M = 3.13$, $SD = 0.78$), $t(41) = 1.33$, $p = .095$.	3

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Author(s); (Year); Journal	Country	Sample size	Mean age	Gender	Ethnicity	Prior experience of yoga	Study design	Duration of yoga intervention	Components of intervention	Control group	Measure of self-compassion (frequency of measurement)	Main findings	EPHPP score
Uebelacker et al. (2023) Clinical Child Psychology and Psychiatry	USA	21	15	Females (83%) Males (17%)	Black or African American (5%) White (71%) Other (10%) More than one race (12%) Did not respond (2%) Hispanic or Latinx (26%) Not Hispanic or Latinx (74%)	No data	RCT	12 x 45min	Physical postures Breath work Meditation Yoga philosophy	N = 21 Group CBT 12 x 45min	SCS – SF (baseline and 1,2,3,6,9)	The yoga group showed an improvement in self-compassion from pre-intervention ($M = 25.32$, $SD = 4.28$) to post-intervention ($M = 30.93$, $SD = 5.92$), $t(13) = 2.82$, $p = .014$.	3

Note. Sample characteristics are for experimental group only. EPHPP = Effective Public Health Practice Project; RCT = Randomised Controlled Trial; SCS = Self-Compassion Scale; SCS – Youth = Self-Compassion Scale – Youth; SCS – SF = Self-Compassion Scale – Short Form.

2.2.5 Quality assessment

The included studies were reviewed for quality using the Effective Public Health Practice Project EPHPP assessment tool (Thomas et al., 2004) which was designed to be applied to quantitative studies. It can be used to evaluate a variety of research designs such as randomised controlled trials, repeated measures designs, and case-control studies (Armijo-Olivo et al., 2012). The measure evaluates methodological rigour in the following areas: selection bias, study design, confounders, blinding, data collection methods, withdrawals and drop-outs, intervention integrity, and analysis. The assessment tool is used alongside a “dictionary” document which describes each item in the tool to assist raters in the assessment process. Each section is scored on a scale of 1-3 (1 = strong, 2 = moderate, and 3 = weak). The global rating for each paper is achieved by summing up the amount of “weak” ratings; if a paper scores no “weak” ratings it is awarded a score of 1 (strong), if it has one “weak” rating it is awarded a score of 2 (moderate), and if it has two or more “weak” ratings it is awarded a score of 3 (weak). The EPHPP has demonstrated construct and content validity, and substantial interrater reliability (Thomas et al., 2004).

A second reviewer independently assessed 25% of the studies, and 100% agreement was reached. All studies were included in the review, despite all having a “weak” quality rating, due to the limited research in this area. Quality assessment total scores are presented in Table 2. Please see Appendix D for a description of the quality assessment criteria, and Appendix E for individual scores of each study.

2.2.6 Data analysis

The results from the studies were synthesized without a meta-analysis. Meta-analysis was considered inappropriate due to the heterogeneity in study designs, samples, and interventions, which are largely due to the novelty of research into this field (Cherry et al., 2024). Furthermore, all of the included studies were rated “weak” by the quality assessment (EPHPP, Thomas et al., 2004), and the lack of rigour across study designs meant that causality could not

be determined. A synthesis without a meta-analysis was therefore deemed to be more informative for this review as it would allow for richer comparison thus subsequently helping to inform how the field could begin to progress.

Synthesis without meta-analysis in systematic reviews (SWiM) guidelines informed the synthesis of study results (Campbell et al., 2020). The studies were grouped by design and the results were narratively synthesised separately for RCTs, quasi-experimental designs, and repeated measures designs. This decision was made based on the differences in methodological rigour between the studies and the subsequent potential for bias. Vote counting was used as a method to summarise the findings (please see Table 3).

2.3 Results

2.3.1 Randomised Controlled Trials

Two out of the eight studies employed RCT designs (Brandao et al., 2024; Uebelacker et al., 2023). Uebelacker et al. (2023) compared the yoga intervention group to a control group who received CBT treatment, and Brandao et al. (2024) used an active control group who engaged in autogenic training group sessions, and a passive control group who received no intervention.

2.3.1.1 Sample characteristics

Overall, 49 young people participated in the yoga interventions. The sample size of the experimental groups was similar between the studies, with Brandao et al. (2024) reporting a sample size of 28 young people and Uebelacker et al. (2023) reporting a sample size of 21 young people. Both samples were voluntary, with Brandao et al.'s (2024) comprising university students and Uebelacker et al.'s (2023) drawn from the general population. The mean age across studies was 18.69 years with a range of 15 years (Uebelacker et al., 2023) to 21.46 years (Brandao et al., 2024). The majority of the sample were female, with percentages ranging from 83% (Uebelacker et al., 2023) to 85.7% (Brandao et al., 2024). Only Uebelacker et al. (2023)

reported the ethnicity of their sample which was predominantly White (71%). The studies differed in quality regarding selection bias whereby Uebelacker et al. (2023) was rated “strong” and Brando et al. (2024) was rated “weak” by the quality assessment (EPHPP, Thomas et al., 2004). Please see Appendix E for quality assessment scores.

2.3.1.2 Yoga interventions

There was similarity across studies in that each intervention included the three limbs of yoga as specified in the inclusion criteria (physical postures, breath work, and meditation). However, each study included an additional component which differed across studies. Brandao et al. (2024) included chanting of mantras and Uebelacker et al. (2023) included yoga philosophy. The length of the interventions varied between studies with participants receiving six, 60-minute sessions in Brandao et al.’s (2024) study, and twelve, 45-minute sessions in Uebelacker et al.’s (2023) study. Brandao et al. (2024) conducted the intervention online whereas Uebelacker et al. (2023) conducted both online and face-to-face sessions. Only Uebelacker et al. (2023) encouraged home practice.

Both studies reported follow up rates of 80% or greater, achieving a rating of “strong” on the quality assessment (EPHPP, Thomas et al., 2004). Both studies complied with the majority of the CLARIFY guidelines for the reporting of yoga research (Ward et al., 2022), with Brandao et al. (2024) meeting 12 out of 14 applicable items, and Uebelacker et al. (2023) met 15 out of 17 applicable items. Please see Appendix F for CLARIFY guidelines adherence.

2.3.1.3 Outcome measures

Both studies used the SCS to measure changes in self-compassion however, whilst Brandao et al. (2024) used the original 26-item version (Neff, 2003b), Uebelacker et al. (2023) used the SCS-SF (Raes et al., 2011) which is a shorter version. The SCS-SF has demonstrated near-perfect correlation with the original SCS (Raes et al., 2011). Both studies collected measures at pre- and post-intervention. Follow-up measures were also completed; Brandao et

al. (2024) collected 1-month follow-up measures whilst Uebelacker et al. (2023) collected follow-up measures after 3 and 6 months. Both studies reported the global SCS scores only.

2.3.1.4 Findings

Both studies found a significant improvement in the global self-compassion score at post-intervention. Whilst Brandao et al. (2024) reported a significant improvement in self-compassion from pre-intervention to follow-up, Uebelacker et al. (2023) found an attenuation in improvement over longer follow-up periods. Brandao et al. (2024) reported an effect size of $\eta^2 = 0.07$ (moderate effect). Uebelacker et al. (2023) did not report an effect size but following calculations, Cohen's d was found to be 1.09 (large effect). It is important to note that both studies were rated “weak” by the quality assessment overall (EPHPP, Thomas et al., 2004) therefore, there was potential for bias and findings should be interpreted with caution.

2.3.2 Quasi-experimental designs

Two studies employed quasi-experimental designs whereby one study used an active control group who participated in a mindfulness special interest group (Beck et al., 2017) and the other study used a passive control group (Gard et al., 2012).

2.3.2.1 Sample characteristics

Overall, 73 young people participated in the yoga interventions. Sample sizes varied between the two studies with a range from 20 participants (Beck et al., 2017) to 53 participants (Gard et al., 2012). The sample in Beck et al.'s (2017) study were university students and the sample in Gard et al.'s (2012) study were students enrolled on the Kripalu Yoga Semester Intensive programme. The mean age of the overall sample was 21.75 years. The mean age was similar between the studies, and it ranged from 20.95 years (Beck et al., 2017) to 22.06 years (Gard et al., 2012). The majority of the sample were female with percentages ranging from 73% (Gard et al., 2012) to 100% (Beck et al., 2017). The sample in Gard et al.'s (2012) study was mainly Caucasian (88%) and no further data was provided regarding the ethnicity of the remaining 12% of the sample. Beck et al. (2017) did not provide ethnicity data. Beck et al.'s

(2017) study was rated “moderate” by the quality assessment regarding selection bias whereas Gard et al.’s (2012) study was rated “weak” (EPHPP, Thomas et al., 2004).

2.3.2.2 Yoga interventions

Beck et al. (2017) created their own yoga intervention whereas Gard et al. (2012) used an available Kripalu Yoga Semester Intensive programme. Both interventions included the three limbs of yoga specified in the inclusion criteria (physical postures, breath work, and meditation) and each included two additional aspects which differed across interventions. Beck et al.’s (2017) intervention included discussion topics and reflective writing, and Gard et al.’s (2012) intervention included daily course work and home practice. There was a notable difference in the dose of yoga which was received by the participants, with the number of sessions ranging from eight, 20-minute sessions (Beck et al., 2017) to 4 months of daily, 3–5-hour sessions (Gard et al., 2012).

Beck et al.’s (2017) study was rated “strong” by the quality assessment regarding withdrawals and dropouts as the follow-up rate was 80% or higher (EPHPP, Thomas et al., 2004). Gard et al.’s (2012) study was rated “moderate” as the follow-up rate was between 60 – 79%. Please see Appendix E for quality assessment scores. Both interventions were conducted face-to-face. Beck et al. (2017) met 12 out of 14 applicable CLARIFY guidelines however, Gard et al. (2012) met eight out of the applicable 13 (Ward et al., 2022). Please see Appendix F for CLARIFY guidelines adherence ratings for each study.

2.3.2.3 Outcome measures

Both studies used the SCS (Neff, 2003b) to measure changes in self-compassion at pre- and post- intervention. Beck et al. (2017) also measured changes at mid-intervention. Beck et al. (2017) reported the global score only whereas Gard et al. (2012) reported global and subscale scores.

2.3.2.4 Findings

Both studies found a significant improvement on the global SCS score at post-intervention. Gard et al. (2012) reported significant improvement on all subscales of the SCS apart from the common humanity subscale. Beck et al. (2017) reported that the significant improvement occurred after 7 sessions. Both studies found large effect sizes; $\eta^2 = .19$ (Beck et al., 2017) and $\eta^2 = 0.22$ (Gard et al., 2012). Despite this, the results of these studies need to be interpreted with caution due to the lack of randomisation and the moderate dropout rate in one of the studies (Gard et al., 2012). Both studies were also rated “weak” by the quality assessment overall (EPHPP, Thomas et al., 2004). These factors indicate a high potential for bias therefore causality cannot be inferred.

2.3.3 Repeated measures designs

Four studies utilised repeated measures designs (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020; Kearns, 2024).

2.3.3.1 Sample characteristics

Overall, the samples consisted of 495 young people. Sample size ranged from 42 participants (Kearns, 2024) to 323 participants (Cox et al., 2019). Two of the studies had similar sample sizes; 42 (Kearns, 2024) and 47 participants (Erkin & Aykar, 2021). One study had a sample size of 83 (Karmer & Cuccolo, 2020), and one had a much larger sample of 323 participants (Cox et al., 2019). Three studies utilised a sample of university students (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020) and one study used primary school pupils (Kearns, 2024). The mean age of the overall sample was 19.3 years, with mean age across studies ranging from 9.7 years (Kearns, 2024) to 20.31 years (Cox et al., 2019). Erkin and Aykar (2021) did not report a mean age rather, they reported an age range of 18-21 years. Therefore, three of the studies had a sample of young people of similar ages (Karmer & Cuccolo, 2020; Cox et al., 2019; Erkin & Aykar, 2021). The majority of the participants were female with percentages ranging from 57.1% (Kearns, 2024) to 100% (Cox et al., 2019; Erkin & Aykar, 2021). The majority

of the sample was White with percentages ranging from 78.9% (Cox et al., 2019) to 90.1% (Karmer & Cuccolo, 2020). One study had a predominantly Hispanic/ Latino sample (Kearns, 2024) and one study did not report ethnicity data (Erkin & Aykar, 2021). All studies were rated “weak” by the quality assessment regarding sample bias (EPHPP, Thomas et al., 2004). Please see Appendix E for quality assessment scores.

2.3.3.2 Yoga interventions

Three of the studies used available “*for credit / elective*” yoga courses for their studies (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020). One study used a chair yoga curriculum from Yoga Ed. called Chair Yoga & Mindfulness for Children (Kearns, 2024). All interventions included physical postures, breath work, and meditation however, three interventions also included additional aspects. Two interventions included discussion topics (Erkin & Aykar, 2021; Kearns, 2024) and one included yoga philosophy (Karmer & Cuccolo, 2020). All interventions were conducted face-to-face.

Three studies were rated “weak” by the quality assessment (EPHPP, Thomas et al., 2004) regarding withdrawals and dropout rates (Cox et al., 2019; Erkin & Aykar, 2021; Kearns (2024). Cox et al. (2019) and Erkin and Aykar (2021) did not report dropout rates, and Kearns (2024) had a follow-up rate of less than 60%. Karmer and Cuccolo (2019) were rated “moderate” by the quality assessment as the follow up rate was between 60-79%. Please see Appendix E for quality assessment scores for each study. Two studies met 10 out of the applicable 13 CLARIFY guidelines (Cox et al., 2019; Kearns, 2024), one study met nine out of the applicable 13 (Karmer & Cuccolo, 2020), and one met eight out of the applicable 15 (Erkin & Aykar, 2021). Please see Appendix F for CLARIFY guidelines adherence.

2.3.3.3 Outcome measures

Three studies used the SCS (Neff, 2003b) to measure changes in self-compassion (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020) and Kearns (2024) used the SCS- Youth (Neff et al., 2021). Three studies collected measures at pre- and post-intervention (Erkin &

Aykar, 2021; Karmer & Cuccolo, 2020; Kearns, 2024) and one study measured changes at pre-, mid-, and post-intervention (Cox et al., 2019). Two studies reported global scores only (Cox et al., 2019; Karmer & Cuccolo, 2020), and two studies reported global and subscale scores (Erkin & Aykar, 2021; Kearns, 2024).

2.3.3.4 Findings

Three studies reported a significant increase in the global score of the SCS at post-intervention (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020). Erkin and Aykar (2021) also reported significant increases on all subscales of the SCS. Kearns (2024) did not find a significant improvement on any of the subscales or the global score of the SCS-Youth. Karmer and Cuccolo (2020) reported a moderate effect size however, as causality cannot be determined from their study design, this should be disregarded. Furthermore, although three studies found significant improvements in self-compassion at post-intervention, the lack of rigour in study designs prevents us from being able to infer causality. The lack of a control group makes it difficult to discern whether the observed changes in self-compassion were due to the intervention or other confounding factors. The dropout rates were also high across studies thus introducing further bias into the results.

Table 2.3

Overview of study findings: direction of effect, statistical significance, study design, and quality assessment rating

Study	Direction of effect	p-value	Study design	Quality assessment rating
Brandao et al. (2024)	Positive	$p < .01$	RCT	Weak
Uebelacker et al. (2023)	Positive	$p = .014$	RCT	Weak
Beck et al. (2017)	Positive	$p < .05$	Quasi-experimental	Weak
Gard et al. (2012)	Positive	$p = .005$	Quasi-experimental	Weak
Cox et al. (2019)	Positive	$p < .05$	Repeated measures	Weak
Erkin & Aykar (2021)	Positive	$p = .001$	Repeated measures	Weak
Karmer & Cuccolo (2020)	Positive	$p < .001$	Repeated measures	Weak
Kearns (2024)	No effect	$p = .095$	Repeated measures	Weak

Note. Studies are presented in accordance with their groupings. Statistical significance was set at $p < .05$. RCT = Randomised Controlled Trial.

2.4 Discussion

2.4.1 Summary of evidence

This systematic review aimed to investigate whether yoga improves self-compassion amongst young people. Studies were grouped by design to account for methodological differences and to enable comparison of evidence across designs. The findings of the RCTs were consistent at post-intervention with both studies reporting a significant improvement in self-compassion (Brandao et al., 2024; Uebelacker., 2023). However, there was a difference in effect size, with Brandao et al. (2024) reporting a moderate effect size and Uebelacker et al. (2023) reporting a large effect size. This could, in part, be explained by the difference in dose whereby participants in Uebelacker et al.'s (2023) study engaged in double the number of sessions. There were also differences at follow-up; Brandao et al. (2024) found a significant

improvement in self-compassion at follow-up however, Uebelacker et al. (2023) observed an attenuation in improvement over the two follow-up periods.

Uebelacker et al. (2023) hypothesised that, given that home practice was challenging for participants, and they were no longer attending class, it was likely that they would have stopped practicing yoga which could explain the attenuation of improvement. This hypothesis could be supported by Gard et al.'s (2014) theory which posits that continued psychological benefit is linked to regular practice. The attenuation in improvement could also be explained by Kishida et al.'s (2018) theory which posits that yoga improves social connectedness thus, in turn, facilitating a bidirectional relationship with compassion. Therefore, as the group sessions came to an end, the social connectedness would have been lost, and this could have led to a subsequent decrease in compassion.

Consistent findings were also reported amongst the two quasi-experimental studies which found a significant improvement in self-compassion at post-intervention, with both studies reporting large effect sizes (Beck et al., 2017; Gard et al., 2012). However, the findings of these studies need to be interpreted with caution due to the lack of randomisation and a moderate level of dropout in one of the studies (Gard et al., 2012). These factors would have likely introduced bias into the findings, meaning that we cannot be confident in inferring causality.

Findings of repeated measures designs were somewhat less consistent, with three out of four studies reporting a significant improvement in self-compassion at post intervention (Cox et al., 2019; Erkin & Aykar, 2021; Karmer & Cuccolo, 2020). However, the lack of rigour across the studies prevents us from being able to infer causality due to a lack of a control group and high levels of dropout, both of which were likely to introduce high levels of bias into the findings.

One study did not find a significant improvement at post-intervention (Kearns, 2024). Kearns (2024) used a younger sample ($M = 9.7$ years) compared to the rest of the studies (Range = 15 years – 22.06 years) therefore, this may have had an impact on the observed results. It is

important to note that Kearns (2024) used the SCS-Youth (Neff et al., 2021) to measure self-compassion and the psychometric properties of the tool were validated using a sample of young people with a mean age of 12 thus they would have been, on average, 2.3 years older than Kearns's sample. Neff et al. (2021) state that the tool is intended for use with early adolescents in middle school whereas Kearns's (2024) sample were in elementary school. This could mean that an inappropriate tool was used which could, in part, have led to an insignificant result. It may have been more appropriate to use the Self-Compassion Scale for Children (Sutton et al., 2018) which has been validated for use with 8–12-year-olds.

Overall, the results were mostly consistent amongst study designs, with seven out of eight studies reporting a significant improvement in self-compassion at post-intervention. However, all studies were rated “weak” by the quality assessment (EPHPP, Thomas et al., 2004) meaning that we are not able to draw conclusions as to whether yoga improves self-compassion amongst young people.

2.4.2 Theoretical implications

Bennetts (2022), Gard et al. (2014), and Kishida et al. (2018) have all proposed theoretical pathways through which yoga is posited to target self-compassion. Unfortunately, the studies included in this review lacked sufficient quality based on the EPHPP quality assessment (Thomas et al., 2004) for us to clearly infer support for the theories posited. Nevertheless, some of the studies reported that they included yoga philosophy and yoga teachings in their interventions and these components would fall under the “yoga ethics” category of the yoga limbs (Gard et al. 2014; Kishida et al., 2018), namely the “yamas” and “niyamas”. Bennetts (2022) argues that self-compassion is targeted through the “yamas” limb and there is preliminary empirical evidence to support this (Pick, 2021). Whilst it could be hypothesised that this is what could have contributed to the observed increase in self-compassion amongst the participants, there is no objective evidence to be able to conclude this. This is an important consideration for future research, which would benefit from adopting more rigorous, theory-driven designs to enable robust exploration of the theoretical claims.

2.4.3 Critique of the literature

All studies included in the review were rated “weak” by the quality assessment (EPHPP, Thomas et al., 2014) which means that we are not able to conclude whether yoga can increase self-compassion amongst young people. The lack of methodological rigour across the studies suggests that the field continues to be in its infancy however, the two RCTs included in the review have been carried out within the last two years which implies that the field may be starting to progress.

Although all interventions included breathwork, physical postures, and meditation, some studies included additional components such as reflective journalling (Beck et al., 2017), chanting mantras (Brandao et al., 2024), and didactic coursework (Gard et al., 2012). Many of the studies did not supply detailed session plans which makes replicability difficult and limits our ability to draw links between the specific aspects of the yoga interventions and the psychological processes that would have been targeted. This issue is exacerbated by the wider variability in methodological designs including the time points at which self-compassion was measured, and the lack of predictive analyses which are required to understand causal mechanisms of change. Furthermore, only two studies measured the consistency of the delivery of the yoga intervention thus there is uncertainty about protocol fidelity which further limits the reliability of the results.

Most studies had a participant dropout rate of >20%, and two studies did not report it, thus this would have introduced bias into the observed findings. The RCTs had the lowest level of dropout and repeated measures designs had the highest level of dropout. The researchers did not report following up on the individuals who dropped out, which is a further limitation as this could have produced valuable insights.

All studies used convenience and voluntary sampling. All of the repeated measures designs utilised participants who were enrolled on special interest yoga courses which were “for university credit”. This means that their motivations to take part in the study may have been

driven by course credit thus potentially impacting their engagement with the practice. For the other designs, volunteers may have been driven by intrinsic motivation and high expectations of improvement in wellbeing which could have resulted in possible placebo effects. There was also a lack of transparency in the recording of participant ethnicity amongst three out of the eight studies. The rest of the reported sample consisted mainly of White females, and the majority of the sample were in their early twenties thus taken together, these factors impact the generalisability of the results to the wider population.

There are criticisms regarding the SCS and researchers' use of the global score only in the reporting of findings, and five out of the eight studies reported global scores only. It is argued that the reverse scored items on the three subscales (self-judgement, isolation, and over-identification) feature items which are more in line with psychopathology rather than compassion therefore, combining all of the scores produces an inaccurate picture of self-compassion (Muris & Otgaar, 2020). Muris and Otgaar (2020) argue that Gilbert's conceptualisation of self-compassion illustrates that compassionate and uncompassionate self-responding reflects different processes which are moderated by different brain systems thus implying that it is not appropriate to combine them in a single score of self-compassion.

Research into yoga and its impact on self-compassion amongst young people is currently in its infancy and to progress, more robust RCTs are needed to tackle population bias and to increase certainty in the effects of the intervention. Future research would also benefit from collecting follow-up measures to determine whether yoga can produce long-lasting improvements in self-compassion. More transparent reporting of the yoga interventions is needed therefore, authors should consider using the Essential Properties of Yoga Questionnaire (EPYQ) (Park et al., 2018) to help them quantify the amount of essential elements of yoga in their interventions, and they should adhere to the CLARIFY guidelines to aid in the reporting of their research (Ward et al., 2022). This would also aid in improving our ability to assess which yoga components target which psychological processes thus enabling us to create tailored interventions. Finally, designs and analytic procedures should be employed that would allow

such inferences to be made as research to date is looking solely at the impact of interventions over pathways to change.

2.4.4 Critique of the current review

To the best of the author's knowledge, this is the first systematic review exploring the impact of yoga on self-compassion amongst young people thus it contributes novel knowledge to the field. The review adhered to the PRISMA guidelines (Page *et al.*, 2020) making it replicable, and the collaboration with a second reviewer during the screening and quality assessment processes adds to its reliability and validity. The data synthesis was informed by the SWiM guidelines (Campbell *et al.*, 2020) to allow for transparent reporting however, certainty of evidence (guideline 6) was not assessed by GRADE, as recommended (Guyatt *et al.*, 2008). However, upon retrospective review of GRADE, the current review appears to have assessed four out of five of the GRADE items (risk of bias, inconsistency, indirectness, and imprecision) however, publication bias was not considered. This review is also limited by only having had included studies which were published in the English language therefore, there is a risk that suitable studies published in other languages may have been omitted.

2.4.5 Clinical applications

Due to the lack of rigour in the studies reviewed, clinical applications are somewhat limited. Nevertheless, there was a positive trend in self-compassion observed amongst the results which means that yoga may have the potential to have a positive impact on self-compassion amongst young people. Yoga offers a novel approach to mental health intervention which could attract those who are not able to access traditional talking therapies. Mental health services might, therefore, wish to consider piloting yoga pathways. Most studies included in this review carried out their yoga interventions at educational institutions; this could be applied in the future to improve access to yoga interventions given that young people tend to spend a lot of their time at school and university. In this way, yoga could be used as early intervention and/ or health promotion, which holds potential to have a positive impact on the number of people

requiring more intensive mental health support. This could also have the potential to indirectly improve wait times and service resources.

2.4.6 Future research

A positive trend in self-compassion was found therefore, further exploration into the impact of yoga on self-compassion amongst young people is warranted. More rigorous study designs are needed, such as robust RCT designs with diverse populations, in order for us to be able to infer causality and for findings to be generalisable.

Future research would also benefit from following up on any dropouts and withdrawals from studies as this could produce valuable insights into potential barriers to engaging in yoga. More effort should be made to reach groups which are currently underrepresented in research; based on the current review, this would include males, ethnic minority groups, and younger children. The field could also benefit from further investigation into why certain groups are more difficult to reach and how barriers to engagement could be removed.

Lastly, future research should consider including other conceptualisations of self-compassion, such as Gilbert's (2014), along with associated outcome measures (such as the Compassionate Engagement and Action Scales, Gilbert et al., 2017) to generate evidence for other proposed processes involved in self-compassion, namely the three flows. Researchers should ensure that all selected outcome measures have been validated for use with their target population.

2.5 Conclusions

Research into the impact of yoga on self-compassion amongst young people is currently in its infancy. Due to this, the current review has not been able to determine causality between yoga and self-compassion. Nevertheless, a positive trend was observed amongst the results meaning that yoga may hold the potential to improve self-compassion amongst young people however, more rigorous research is needed for us to be able to conclude this.

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Chapter 2

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Chapter 3 Empirical Paper

An exploration into participant experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample

Journal Specification: The following paper has been prepared for submission to the journal of Complementary Therapies in Clinical Practice. The guidelines for authors are provided in Appendix B.

Word Count: 11,745

Abstract

Background and Purpose

Research shows that although bariatric surgery can be an effective weight loss method for some, others continue to struggle with body image, weight self-stigma, emotion regulation, and disordered eating. Although support is available through talking therapies, some people struggle to access this therefore, this study explored whether yoga could be a feasible alternative intervention for the post-bariatric surgery population.

Materials and Methods

A voluntary sample ($n = 40$) who had undergone bariatric surgery >2 years prior, engaged in four online sessions of Hatha yoga. All participants completed pre- and post-intervention measures for body compassion, weight self-stigma, emotion dysregulation, and intuitive eating. 14 participants also attended semi-structured interviews to discuss their experiences of the intervention. Thematic analysis was utilised to analyse the qualitative data, and t-tests were used to measure within subject changes on the questionnaire measures.

Results

Recruitment met the initial target and the retention rate was 72.5%. Participant feedback indicated that the intervention was experienced as acceptable and beneficial. Qualitative analysis revealed six themes: compassion, reported benefits, increased awareness and encouragement of yoga practice, reasons for engagement in the study, difficulties following surgery, and difficulties in sessions. T-tests showed a significant improvement in unconditional permission to eat and motivated action towards body acceptance.

Conclusion

Overall, the findings provide preliminary support for yoga's potential to be a feasible intervention for the post-bariatric surgery population however, more rigorous research is needed to increase confidence in the observed effects of the intervention.

Keywords: yoga, post-bariatric surgery, body compassion, weight self-stigma, emotion regulation, intuitive eating

3.1 Introduction

Bariatric surgery is an invasive weight loss procedure which works by altering the digestive system to reduce the amount of food that is consumed and/ or the number of calories that are absorbed (NHS, 2024). In the UK, bariatric surgery is only offered to people with a Body Mass Index (BMI) of 40 and above (or 35 if they have a comorbid physical health condition) who have not been able to lose weight through alternative methods such as dieting and exercise (NHS, 2024). The surgery can also be considered for people whose BMI is under 40 if they are from South Asian, Chinese, other Asian, Middle Eastern, Black African or African-Caribbean family backgrounds (NHS, 2024). This is because these populations have a higher chance of developing health problems, such as Type 2 diabetes, at a lower BMI (Caleyachetty et al., 2021; NHS, 2023a). BMI is a measure of whether an individual is a healthy weight based on their height, and it is measured by dividing weight in kilograms by height in meters squared (Cleveland Clinic, 2022). Based on the BMI categories, individuals with a BMI of 30 to 39.9 are considered to be “obese”, and those with a BMI of 40 and above are considered to be “severely obese”. People from ethnic minority backgrounds are considered to be “obese” if their BMI is above 27.5 (NHS, 2023b).

Research evidence suggests that people living in bigger bodies encounter social mistreatment and devaluation in Western societies (Gastón-Panthaki et al., 2023) which contributes to the development of weight self-stigma whereby people who identify with a stigmatised group feel fearful about being discriminated against and they develop self-devaluating thoughts (Lillis et al., 2010). Weight self-stigma has been found to be a motivating factor for people to seek bariatric surgery; pre-surgery patients report that one of their main reasons for surgery is a desire to change their physical appearance with the aim of improving their mental health (Pearl et al., 2019). However, whilst bariatric surgery can result in positive outcomes for some, others continue to struggle with their body image, their weight, and their psychological health following surgery (Kubik et al., 2013).

3.1.1 Difficulties following bariatric surgery

Rates of weight regain following bariatric surgery have been shown to range from 5.7% at 2 years to 75.6% at 6 years (Lauti et al., 2016), with the largest change in weight regain occurring 2 years after reaching the lowest post-operative weight (King et al., 2018). The causes of weight regain are argued to be due to life stressors which can cause intense emotions, resulting in a loss of control over weight management (Tolvanen et al., 2022). Barbuti et al. (2021) found that people living in bigger bodies tend to cope with negative emotions by turning to food in the absence of alternative emotion regulation strategies. Emotion regulation describes a person's

ability to effectively manage and respond to an emotional experience (Gross, 2008). Some strategies are adaptive whereby they help to diffuse strong emotions and enable problem-solving, and other coping strategies are maladaptive whereby they provide short-term relief from the intense emotions but subsequently cause negative long-term effects (Rolston & Lloyd-Richardson, 2017). Using food to cope is an example of a maladaptive coping strategy as it results in unwanted weight gain which leads to emotional distress and shame (Tolvanen et al., 2022).

Augustus-Horvath & Tylka (2011) argue that shame associated with body size can result in disordered eating behaviour thus maintaining a vicious cycle. The association between weight related shame and emotional eating is well-documented (Craven & Fekete, 2019; O’Loghlen et al., 2022; Palmeira et al., 2017). Unconditional acceptance by others can help to break this cycle as it can lead to a greater emphasis on body function over appearance which can subsequently lead to greater body appreciation and result in intuitive eating (Avalos & Tylka, 2006). Intuitive eating refers to the ability to follow physical hunger and satiety cues when determining when, what, and how much to eat (Tylka & Kroon Van Diest, 2013). Intuitive eating and emotional eating exist on the opposite ends of the eating behaviour continuum whereby intuitive eating falls under “attuned” eating which is classed as adaptive, and emotional eating falls under “disinhibited” eating which is classed as maladaptive (Kerin et al., 2019). Intuitive eating has been found to be associated with different positive psychological constructs such as positive body image, self-esteem, and wellbeing (Linardon et al., 2021).

Those who present with body image dissatisfaction following sustained weight loss tend to do so as a result of loose skin (Sarwer et al., 2008). Loose skin is a common issue amongst the post-bariatric population; Kitzinger et al. (2012) found that out of 252 participants who underwent bariatric surgery between 2003 and 2009, 96% developed loose skin. Individuals report feelings of shame associated with excess skin (Lyons et al., 2014) and a large percentage have voiced a desire to undergo body contouring surgery with the aim of improving their self-confidence and quality of life (Kitzinger et al., 2012). A report from the American Society of Plastic Surgeons (ASPS) shows that 46,577 patients underwent a body contouring procedure following bariatric surgery in 2020 (ASPS, 2020). Body contouring surgery is not currently available in the NHS meaning that individuals in the UK would have to seek private treatment for this however, this would not be financially viable for all.

Based on the reviewed literature it would appear that bariatric surgery, in isolation, may not address all of the original, and resulting, concerns of self-stigma which may impact on psychological wellbeing.

3.1.2 Available interventions

The National Institute for Health and Care Excellence (NICE) (NICE, 2016) recommends that following bariatric surgery, individuals should be offered a follow-up care package for a minimum of 2 years which should include support from a multidisciplinary team including dietetics, medicine, and psychology. There is no guidance regarding aftercare following the 2-year period and it seems that the support drastically decreases even though, as illustrated by the literature, individuals are likely to struggle with their weight, emotion regulation, and emotional eating beyond this point (King et al., 2018; Tolvanen et al., 2022).

Although there is no guidance regarding aftercare at 2 years post-surgery, people can be referred for psychological support to NHS Talking Therapies. A recent systematic review found that bariatric surgery patients who received post-operative psychological interventions experienced improvements in health-related outcomes (Van Zyl et al., 2020). Acceptance and Commitment Therapy (ACT) appeared to be the most effective psychological intervention, with psychological flexibility being the key change mechanism which resulted in reductions in weight self-stigma, improved eating behaviours, and a better quality of life (Van Zyl et al., 2020). Psychological flexibility is the ability *“to respond to situations in ways that facilitate valued goal pursuit”* (Doorley et al., 2020, p.2).

Unfortunately, not everyone is able to access talking therapies; it has been found that there is an underrepresentation of people seeking help who are from working class backgrounds (Holman, 2014), men (Liddon et al., 2018), and ethnic minorities (Alam et al., 2024). Common barriers to help seeking include stigmatising beliefs (fear of negative judgement and shame), difficulties in identifying and expressing concerns (Salaheddin & Mason, 2016), language barriers, power imbalance, and cultural naivety (Alam et al., 2024). This raises the question of what alternative forms of therapy could be offered to these populations.

3.1.3 Yoga

Yoga has been gaining popularity in the West and yoga-based techniques are being used more widely as part of a holistic treatment approach (Varambally & Gangadhar, 2016). Emerging research has been encouraging; findings report observed reductions in anxiety and depression (Brinsley et al., 2021; Weaver & Darragh, 2015), and reported improvements in self-compassion (Crews et al., 2016) amongst different populations. To the researcher's knowledge, there is currently no evidence regarding the impact of yoga on psychological mechanisms involved in the maintenance of distress amongst the post-bariatric surgery population.

Yoga is a practice which originated in India many centuries ago, and one of the leading ancient texts of yoga is the Yoga Sutras of Patanjali. Patanjali was a sage¹ who lived in 2nd century BC and he developed the “sutras”, meaning “threads”, that stitch together the wisdom of yoga (Ram, 2009). The sutras define eight limbs of yoga which develop in parallel to one another during yoga practice to achieve the end goal of samadhi (enlightenment) (Hartranft, 2003). The limbs, in ascending order, include moral restraints (yamas), ethical observances (niyamas), physical postures (asanas), breath control (pranayama), sensory withdrawal (pratyahara), concentration (dharana), meditation (dhyana), and meditative absorption (samadhi) (Bryant, 2015). Yoga is therefore much more than just physical postures with which it is often associated in the West (Bennetts, 2022).

Gard et al. (2014) propose that yoga yields psychological benefits through an integration of top-down and bottom-up processes which facilitate a bidirectional relationship between the brain and body. They condensed the eight limbs of yoga into four mechanisms (ethical precepts, meditation, breathing techniques, and movement practices), and they propose that top-down processes involve ethical precepts and meditation, and bottom-up processes include breathing techniques and movement practices. All four processes have been shown to decrease psychological stress, and to regulate the activity of the hypothalamic-pituitary axis and the sympathetic nervous system resulting in better immune function and emotional wellbeing (Sullivan et al., 2018).

Kishida et al. (2018) carried out a qualitative investigation with yoga practisers and found that yoga was reported to enhance mindfulness, self-compassion, compassion towards others, and social connectedness, all of which have interpersonal and intrapersonal benefits thus resulting in subsequent improvement in health and wellbeing. Both Kishida et al. (2018) and Guard et al. (2014) found that repeated yoga practice was associated with increased wellbeing. Although these models consider transdiagnostic processes in yoga practice (mechanisms which are common across disorders), they do not make clear predictions as to which specific limbs target which specific psychological processes. This makes it difficult to understand how yoga interventions may be compared with talking therapies meaning that the evidence base for yoga as an intervention for psychological distress remains significantly limited with regards to clinical implications (Bennetts, 2022).

To address this gap, Bennetts (2022) proposed a model which illustrates the parallels between the eight limbs of yoga and the practice and ethos of third-wave psychological approaches such as Acceptance and Commitment Therapy (ACT) and Compassion Focused

¹ “Sage” refers to a wise and enlightened individual.

Therapy (CFT) which include, amongst others, learning self-compassion and emotion regulation. ACT was found to be effective at reducing weight self-stigma, improving eating behaviours and quality of life amongst post-bariatric surgery patients (Van Zyl et al., 2020), and CFT has been found to reduce feelings of shame and self-criticism, and to improve self-compassion in participants with obesity (Carter et al., 2023). Bennetts' model (Bennetts, 2022) would, therefore, suggest that similar improvements could be achieved with yoga practice.

3.1.4 Rationale for the study

This study explored whether yoga could be a feasible treatment option for people who continue to experience psychological difficulties following bariatric surgery. The inclusion criteria for this study were: (1) age 18+, (2) currently residing in the UK, (3) underwent surgery a minimum of 2 years ago, (4) medically fit to take part in the study. Criterion 3 was based on review of the literature which suggests that people are likely to start regaining weight at this point which can cause psychological distress (Tolvanen et al., 2022), and as NHS support ceases at this stage (NICE, 2016), people are likely to feel less well supported.

The primary research question of this study was: “what are the experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample?”. This question aimed to explore whether reported experiences would align with the underlying theory of change in yoga practice (Bennetts, 2022). A further aim was to gather insights that would help us understand the feasibility of yoga as a possible intervention for the post-bariatric population which would subsequently help to inform the development of future research and interventions.

The secondary research question aimed to explore whether body compassion, weight self-stigma, emotion regulation, and intuitive eating would improve at the end of the yoga intervention. These dependent variables were chosen based on existing literature which suggests that weight self-stigma, emotion dysregulation, and emotional eating are mechanisms which maintain psychological distress amongst the post-bariatric surgery population (Pearl et al., 2019; Tolvanen et al., 2022).

For the purposes of this study, body compassion was chosen as the fourth dependent variable. It is a relatively new construct, and it has been defined as “*compassion directed to one's own body, incorporating elements of kindness, common humanity and mindful awareness, as well as elements of sensitivity to body-related distress, pain and suffering, and the motivation and ability to combat this*” (Beadle et al., 2021, p.7). The conceptualisation of body compassion incorporates Gilbert's (2014) and Neff's (2003) theories of compassion, applying them to body image. It is recommended that body compassion be measured in

research into body shame which is associated with disordered eating (Beadle et al., 2021) thus its use would be indicated for this study.

Intuitive eating was chosen as a dependent variable because it has been linked to greater interoceptive awareness which is a process of identifying and listening to internal bodily signals (Herbert et al., 2013). Lower levels of interoceptive awareness have been linked to overeating and higher BMI (Robinson et al., 2021). Yoga is argued to target interoception (Bennetts, 2022) and there is preliminary evidence which supports this (Neukirch et al., 2019) therefore, this study was interested in exploring whether yoga could result in more intuitive eating.

3.1.5 Hypotheses

The following hypotheses are presented for the quantitative aspect of the study:

1. Scores on the Body Compassion Questionnaire (Beadle et al., 2021) will be higher at post-intervention compared to pre-intervention
2. Scores on the Intuitive Eating Scale-2 (Tylka & Kroon Van Diest, 2013) will be higher at post-intervention compared to pre-intervention
3. Scores on the Difficulties in Emotion Regulation Scale - 16 (Bjureberg et al., 2016) will be lower at post-intervention compared to pre-intervention
4. Scores on the Weight Self-Stigma Questionnaire (Lilis et al., 2010) will be lower at post-intervention compared to pre-intervention

3.2 Materials and Methods

3.2.1 Ethical considerations

This study was approved by the University of Southampton Ethics and Research Governance Committee (ERGO Ethics ID: 94614; Appendix G). All participants were over the age of 18 and they gave their informed consent to participate in the study by completing online consent statements (Appendix H).

3.2.2 Design

The researcher was influenced by pragmatist epistemology (Duram, 2010) therefore, a mixed methods design was chosen to provide a holistic picture of the findings. The qualitative aspect of the study aimed to explore whether participant experiences would align with the underlying theory of change in yoga practice (Bennetts, 2022). Bennetts' (2022) theory was applied to the post-bariatric population thus the interviews aimed to explore whether

participants would report an increase in compassion, emotion regulation, interoception, and cognitive flexibility. Cognitive inflexibility has been associated with higher levels of weight self-stigma and existing research posits that increasing cognitive flexibility could result in an improvement in weight self-stigma (Petersen et al., 2021). The interviews also aimed to explore how the intervention was received by the participants thus helping to inform on acceptability and feasibility.

Semi-structured interviews were chosen as a method of qualitative data collection as they offer more flexibility than structured interviews meaning that the researcher can ask follow-up questions (Adams, 2015). This can result in richer data and it may allow for the development of a better rapport with the participants, and although semi-structured interviews are flexible, they still provide a plan for the researcher, unlike unstructured interviews, thus helping the conversation stay focused (Boswell, 2024).

The secondary research aim was to explore within-subject changes in body compassion, weight self-stigma, emotion regulation, and intuitive eating. Changes in these dependent variables were measured via online questionnaires at pre- and post-intervention. The qualitative and quantitative findings were compared to explore whether they align. Please see section 3.2.5 for a description of the measures.

3.2.3 Power analysis

Power analysis was calculated using G*Power (version 3.1.9.2; Faul et al., 2013) which suggested a minimum sample of 15 participants for a large effect size, and a sample of 34 participants for a medium effect size, power of 0.80, for a dependent samples t-test. Given that the recommendation for yoga class numbers is between 10 to 30 participants (Loehr, 2018), and given that previous yoga intervention studies found moderate to large effect sizes for body image and self-compassion (Halliwell et al., 2019; Webb et al., 2022), the researcher made the decision to include a sample of 30 participants in the study, based on class-size recommendation and aiming for medium effect size.

To account for dropout, the aim was to recruit a minimum of 40 participants. Participants were made aware (through the participant information sheet and the thesis recruitment poster) that spaces for the intervention were limited and would be secured on a first come, first served basis (please see Appendix H and I, respectively).

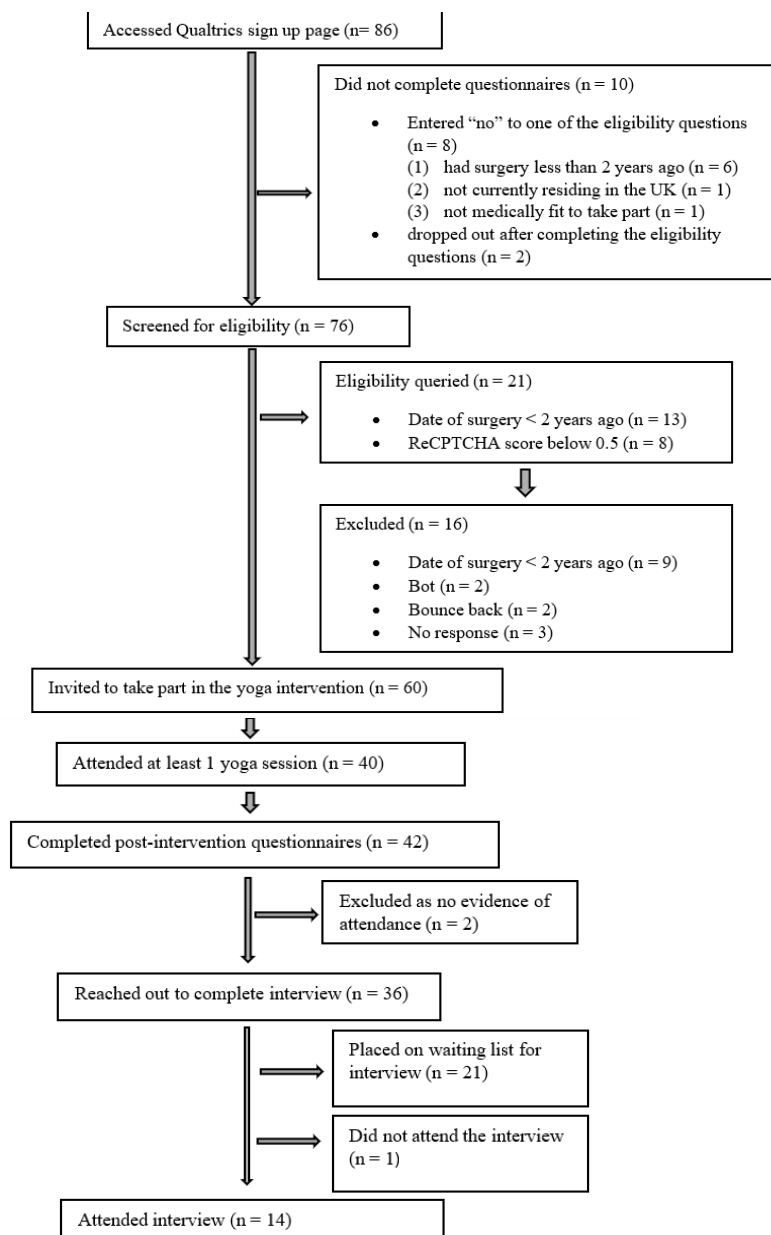
Clarke and Braun (2013) recommend a sample of 6-15 participants for a Thematic Analysis for professional Doctorate projects therefore, this was the target number for the interviews for this study.

3.2.4 Participants

Participants were eligible for the study if they were aged 18 or over, were residing in the UK, and their bariatric surgery was a minimum of 2 years ago. In total, 76 participants signed up for the study however, the final sample consisted of 40 participants who were included in the quantitative analysis, and a subset of 14 were included in the qualitative analysis. Please see Figure 1 for consort diagram.

Figure 3.1

CONSORT flow diagram of participants recruited, reasons for exclusion, attendance of yoga sessions, and attendance of interviews.



3.2.5 Measures

3.2.5.1 Part 1 (completed by participants)

3.2.5.1.1 Eligibility questions

Participants were asked to complete four mandatory eligibility questions which were: (1) are you aged 18 or over? (2) have you undergone bariatric surgery a minimum of 2 years ago? (3) are you currently residing in the UK? (4) are you medically fit to take part in the yoga intervention? If “no” was selected for any of the questions, participants received a message informing them that they were ineligible to take part in the study and the system prevented them from being able to progress further. If “yes” was selected for all questions, participants progressed to completing the remaining questionnaires.

3.2.5.1.2 Demographic questionnaire

Eligible participants were asked to complete a demographic questionnaire which included: age, gender, ethnicity, date of bariatric surgery, and whether they practice yoga currently or have done so in the past.

3.2.5.1.3 Body Compassion Questionnaire (BCQ; Beadle et al., 2021)

The BCQ is a 23-item self-report questionnaire which was developed to measure body compassion. The BCQ consists of three subscales: body kindness (BK), common humanity (CH), and motivated action (MA). Responses to questions are scored using a Likert scale from 1 (almost never) to 5 (almost always). Overall body compassion is calculated using a mean score of all 23 items with higher scores indicating higher body compassion. To obtain subscale scores, a mean score is calculated from the items in each subscale. For the purposes of this study, both total and subscale scores were used. The BCQ has good internal reliability ($\alpha = .86$), construct validity, and test-retest reliability ($r = .89, p < .001$) (Beadle et al., 2021).

3.2.5.1.4 Difficulties in Emotion Regulation Scale – 16 item version (DERS-16; Bjureberg et al., 2016)

The DERS-16 is a self-report measure that is based on the original 36-item version (Gratz & Roemer, 2004) which measures the level of difficulty in emotion regulation. The short version of the questionnaire was chosen for this study to reduce cumbersomeness. The DERS-16 assesses five aspects of emotion dysregulation: non-acceptance of emotional responses (Non-acceptance), difficulty engaging in goal-directed behaviour (Goals), impulse control difficulties (Impulse), limited access to emotion regulation strategies (Strategies), and lack of emotional clarity (Clarity). Responses are scored on a 5-point Likert scale from 1 (almost never) to 5

(almost always). The total score on the DERS-16 is obtained by summing up all items. The score ranges from 16-80 with higher scores indicating greater difficulties in emotion regulation. The subscale scores are obtained by summing up items in the subscale, and higher scores indicate greater difficulty with the associated subscale concept. For the purposes of this study, both the total and subscale scores were used. The internal consistency of the DERS-16 was found to be excellent ($\alpha = .92$), and it was strongly associated with the original 36-item version ($r = .93$). The test-retest reliability of the DERS-16 was also good ($\rho_t = .85$; $p < .001$) (Bjureberg *et al.*, 2016).

3.2.5.1.5 Weight Self Stigma Questionnaire (WSSQ; Lillis et al., 2010)

The WSSQ is a 12-item, self-report questionnaire developed for use with populations who are overweight or obese. It contains two subscales: “self-devaluation” and “fear of enacted stigma”. All items are rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores reflecting the presence of more weight self-stigma. The WSSQ has been shown to have good reliability ($\alpha = 0.88$), excellent test-retest correlation (0.78), and good construct validity (Lillis *et al.*, 2010).

3.2.5.1.6 Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013)

The IES-2 is an updated version of the original IES measure (Tylka, 2006). It is a 23-item, self-report questionnaire containing four subscales: unconditional permission to eat (UPE), eating for physical rather than emotional reasons (EPR), reliance on hunger and satiety cues (RHSC), and body-food choice congruence (BFCC). The IES-2 is scored on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating a greater ability to eat intuitively. For the purposes of this study, both total and subscale scores were used. The IES-2 showed excellent internal reliability for women and men respectively ($\alpha = .87$ and $\alpha = .89$). Convergent validity was also good for women ($r = .87$) and for men ($r = .91$). Test-retest reliability was good for women (.88) and excellent for men (.92) (Tylka & Kroon Van Diest, 2013).

3.2.5.2 Part 2 (completed by the researcher)

3.2.5.2.1 Essential Properties of Yoga Questionnaire (EPYQ) (Park et al., 2018)

The EPYQ was developed to measure, describe, and quantify the objectively observable amount of essential elements of yoga present in yoga interventions. The questionnaire measures fourteen key dimensions of yoga: acceptance/compassion, body locks (bandhas), body awareness, breathwork, instructor mention of health benefits, individual attention, meditation and mindfulness, mental and emotional awareness, physicality, active postures, restorative postures, social aspects, spirituality, and yoga philosophy. The measure has good reliability, with all fourteen scales having Cronbach’s alphas of between .70 and .90, with most

above .80, and research has shown that it is a valid measure of multiple dimensions of yoga (Park et al., 2018).

3.2.6 Procedure

3.2.6.1 Recruitment

This study used a voluntary sample. A recruitment poster (Appendix I) was jointly developed with Patient and Public Involvement (PPI) and it was advertised on social media platforms including Instagram, the University's X page, as well as Facebook and Reddit support groups for bariatric surgery patients (please see Appendix J for recruitment strategy). A physical copy of the research poster was also displayed on supermarket information boards and in the psychology building at the University. Participants accessed the study via a QR code or a Qualtrics link. They were required to read through a participant information sheet and to complete consent statements (please see Appendix H). Participants also completed eligibility questions and if they were eligible, they proceeded to complete the pre-intervention measures. Once complete, participants were contacted by the researcher to arrange engagement with the intervention and the interview.

3.2.6.2 Questionnaire completion

At pre-intervention, participants completed the demographic questionnaire, the BCQ, DERS-16, WSSQ, and IES-2. At post-intervention, participants completed the BCQ, DERS-16, WSSQ, IES-2, and a feedback form (Appendix U).

3.2.6.3 Assessing eligibility

It was noticed that some responses were made in quick succession of one another, they had low ReCAPTCHA scores of below 0.5, and they were flagged by Qualtrics as potential bots. Qualtrics recommends that responses with ReCAPTCHA scores of < 0.5 should be excluded from analysis (Qualtrics, 2025) however, following discussions with the research team, it was decided that those participants should be contacted to check their eligibility as the ReCAPTCHA score has been shown to not be reliable (Goodrich et al., 2023).

Five out of twenty-two participants whose eligibility was questioned responded to the email and they were subsequently deemed to be eligible based on their date of surgery and coherent response. They were therefore invited to take part in the intervention. The remaining participants were not eligible to take part (please see Figure 1 for reasons for ineligibility). Participants who were not eligible were sent an email explaining why they would not be able to take part in the study (please see Appendix S).

3.2.6.4 Yoga intervention

Based on the underpinning theory of change mechanisms in yoga (Bennetts, 2022) and supporting evidence (Pick, 2021), the intervention was designed specifically with an emphasis on the inclusion of “ahimsa” (one of the “yamas” referring to non-violence) throughout all practices with the aim of targeting compassion. Each yoga session included breath work, physical postures, meditation, body scan, and a finishing quote. Please see Appendix T for session plans, and Appendix R for further information regarding the intervention. The EPYQ was completed live for sessions 2-4 (please see Appendix Q and R).

The intervention took place once a week from 16/01/2025 until 06/02/2025. The four online sessions were conducted via Microsoft Teams and lasted one hour each. The yoga instructor was female, she had received over 1000 hours of teaching training, and she had 30 years of teaching experience. Modifications were encouraged throughout the classes and participants were given the option of using a chair for support. Home practice was not discussed. The numbers of participants present in each session were noted by the researcher (please see section 3.3.2 for participant numbers).

3.2.6.5 Interviews

A total of 36 participants responded to the invitation for interview therefore, 15 of the participants who responded first were sent a confirmation email with a Microsoft Teams link to the interview. The remaining participants were placed on a waiting list in the order in which they responded, and they were informed that if a space became available, they would be contacted.

The interview was semi-structured, and the topic guide was jointly developed with the research team and a member of PPI (please see Appendix W). The interview took place online via Microsoft Teams and participants had the option of having their camera switched off to help them feel more comfortable. The interview was recorded for the purpose of creating a transcript. The interviews ranged in length from 10-42 minutes, with an average length of 20 minutes. In total, 14 participants completed the interview. One participant did not attend (despite rescheduling) however, it was felt that data saturation had been reached therefore, the interview stage was brought to a close.

The interviews were transcribed verbatim with the help of three Voluntary Research Interns (VRIs). The researcher transcribed five of the interviews and the VRIs helped to transcribe the remaining nine.

3.2.6.6 Reimbursement

Once the interviews were complete, all 40 participants were emailed the debriefing form (Appendix Z) and a £25 Amazon e-voucher.

3.2.7 Data analysis

3.2.7.1 Qualitative analysis

Thematic Analysis (Braun & Clarke, 2006) was deemed the most suitable analytic method to address the research question based on its ability to develop common themes amongst the data. The 6-step process of Thematic Analysis was followed (Braun & Clark, 2006). Firstly, the interviews were transcribed verbatim (with the assistance of VRIs) and re-read several times to ensure familiarity. Once complete, NVivo 14 software (Lumivero, 2023) was used to aid in the analytic process whereby the transcripts were coded inductively, using meaning as a coding unit. The coding process was iterative; it involved oscillating between the transcripts to ensure that all relevant information had been coded, and to refine the codes. The codes were then extracted from NVivo and they were grouped into categories which helped to create initial themes. In line with Step 4, the initial themes were reviewed, and it was noted that two of the themes contained more codes than any of the other themes and there were clear themes within them therefore, subthemes were created. Lastly, the names of the themes and subthemes were refined and finalised. Please see Appendix X and Y respectively for an excerpt of the coding manual and the thematic map.

3.2.7.2 Quantitative analysis

SPSS Software (Version 30.0.0.0) was used to carry out the quantitative data analysis. Firstly, the data was checked for missing values and outliers. One missing value was found on the post-intervention BCQ questionnaire, Q21. As the value was missing completely at random, series mean was used to treat the missing value (Kang, 2013). Outliers were examined for pre-, post-, and change scores by examining box plots. Outliers which fell within the 3rd quartile were retained in the analysis as it has been recommended that such outliers should be kept as they do not exert undue influence on the results, and they preserve the accuracy of the data (Iacobucci et al., 2025). Some extreme outliers were also found (values which fell outside of the 3rd quartile) therefore, analyses were run with and without these outliers to judge their impact. The results did not differ significantly therefore, it was deemed most appropriate to retain all values.

Visual inspection of the histograms and normal probability plots for the BCQ and its subscales indicated that the data was approximately normally distributed. Boxplots suggested

that the variances of the groups were reasonably homogenous. The Shapiro-Wilk tests were also non-significant.

The WSSQ data was not normally distributed; the histogram revealed a negative skew (-1.675) and the kurtosis value was 4.889 thus violating the assumptions of normality. Furthermore, the Shapiro-Wilk test was significant $p > .001$. Based on this, it was deemed appropriate to use a non-parametric test.

The DERS-16 data was approximately normally distributed. The Shapiro-Wilk test was non-significant for all subscales apart from the Clarity subscale however, both skewness (-.249) and kurtosis (3.588) were within the normal range therefore, it was deemed that a t-test would still be appropriate especially as it is robust to violations of normality with sample sizes of 40 and above (Lumley et al., 2002).

The IES-2 data was mostly normally distributed apart from the EPR subscale which had a positive skew (1.121) and the Shapiro-Wilk test was significant $p = .002$. Based on this, it was deemed appropriate to use a non-parametric test.

SPSS Software (Version 30.0.0.0) was used to run dependent samples t-tests to compare the outcome measure means at pre- and post-intervention for global and subscale scores. The Wilcoxon signed-rank test was used for the data which was not normally distributed.

3.3 Results

3.3.1 Participant characteristics

Participant characteristics are presented in Table 1. The majority of the sample were male (67.5%) with a mean age of 32.40. The majority of participants were Black African (27.5%) and Black Caribbean (27.5%). Time since surgery ranged from 25 months to eight years and eight months. Most people had not previously practiced yoga (57.5%).

A total of 14 participants attended the interviews; eight participants were male (57.14%) and six were female (42.86%). The mean age was 33.64 years. Eight participants identified as Black (57.1%), five identified as White (35.7%), and one identified as Multiethnic (7.1%). Please see Table 2 for further demographic information about the interview sample.

Table 3.1*Demographics of total sample*

Demographics										
<i>(n = 40)</i>										
Age – mean (SD)	32.40 (8.29)									
Gender – n (%)	Male 27 (67.5) Female 13 (32.5)									
Ethnicity – n (%)	Indian 1 (2.5)	Pakistani 1 (2.5)	Any other Asian background 1 (2.5)	African 11 (27.5)	Caribbean 11 (27.5)	Any other Black, Black British, or Caribbean background 4 (10)	White and Black African 2 (5)	White and Black Caribbean 1 (2.5)	White British 6 (15)	Any other White background 2 (5)
Time since surgery - range	25 months – 8 years + 8 months									
Previous yoga experience – n (%)	Yes 17 (42.5) No 23 (57.5)									

Table 3.2*Demographics of interview sample*

Demographics						
(n = 14)						
Age – mean (SD)	33.64 (9.94)					
Gender – n (%)	Male 8 (57.14) Female 6 (42.86)					
Ethnicity – n (%)	African 5 (35.7)	Caribbean 1 (7.1)	Any other Black, Black British, or Caribbean background 2 (14.3)	White and Black African 1 (7.1)	White British 4 (28.6)	Any other White background 1 (7.1)

3.3.2 Withdrawals and drop-out

Out of the 60 eligible participants who were invited to take part in the study, 40 (66%) attended the first session. 39 participants attended session 2, 36 attended session 3, and 29 attended session 4. This means that 90% of participants attended all 3 sessions and there was a dropout rate of 19.5% between the third and fourth session. The overall dropout rate from the start to the end of the intervention was 27.5%.

3.3.3 Qualitative Results

The analysis revealed six key themes: (1) compassion; (2) reported benefits; (3) increased awareness, and encouragement, of yoga practice; (4) reasons for engaging in the study; (5) difficulties following surgery; (6) difficulties in sessions.

3.3.3.1 Compassion

Whilst discussing their experience of the intervention, participant responses illustrated that compassion was present throughout their practice. The responses aligned with Gilbert's conceptualisation of compassion whereby suffering is acknowledged and motivated action is taken towards relieving the suffering (Gilbert, 2014). This gave rise to the theme "compassion" which contains four subthemes: (1) demonstration of self-compassion during yoga sessions, (2) increase in self-acceptance, (3) adaptations were welcomed, and (4) permission.

3.3.3.1.1 Demonstration of self-compassion during yoga sessions

Many participants spoke about experiencing some difficulties at the beginning of the intervention however, they discussed that they accepted this as they were aware that they were beginners. They also reported that despite experiencing difficulties, they felt determined to continue engaging in the practice:

“I just know that it shouldn't be all that easy for me because I'm a beginner, so I wasn't expecting to just do everything perfectly like, so, I just had to pass [opt out of the more difficult poses]. I need to pass so I don't injure myself and can continue.” (Participant 1)

“(...) at first when I did it, I was like, wow, can I really do this? This seems more difficult than I thought. So, for that reason, I feel like, should I just give up on it? But a part of me said: if your instructor can do it, then you should be able to do it. So, I said, fine, let me just do this one more time and see. I've been putting a lot of energy into it (...) So, I discovered, like, it takes time for someone to actually adjust properly to it. So, the first time would definitely be very tedious, it wouldn't be that easy, so I decided to do more.” (Participant 4)

Participant responses indicated that self-compassion may have developed in response to receiving compassion from the instructor. This illustrates two out of the three flows of compassion based on Gilbert's theory (compassion from others, and self-compassion) (Gilbert, 2014):

“(...) but the instructor showed that yoga is not just about progress, it's not about perfection. So, in time, you get more comfortable and start enjoying it more.” (Participant 7)

3.3.3.1.2 Increase in self- acceptance

Participants reported that they started to become more accepting of their bodies, and that they started to develop greater appreciation for their bodies:

“My body is not perfect, yes, it's not where I want it to be but just trying to be a bit more kinder. Particularly with your thoughts because the more negative you think, the more that's what you're putting out. So, it's just trying to be a wee bit kinder to yourself.” (Participant 11)

“(...) so I've seen my body, like my general well-being, as something very important and something that I don't have to take for granted”. (Participant 4)

Some participants reported that they also started to become more accepting of themselves as a whole:

“I was having to reconnect with myself again and I found that really beneficial, that it’s OK that this is me. This is part of who I am, and this is part of my journey.” (Participant 8)

Others discussed that they were implementing what they had learnt in the yoga sessions into their daily lives to help them increase their self-acceptance:

“I practice more of holding myself, and practicing the crossed arms across my shoulders, just to embrace myself and to also help me in self-acceptance and also accept my body.” (Participant 13)

3.3.3.1.3 Adaptations were welcomed

Participants showed compassion towards themselves by implementing adaptations to movements which were difficult for them. Many participants found having the chair as a prop beneficial, and although negative self-judgements may have been present about this at the beginning, the compassion received from the instructor seemed to help to diffuse them:

“The fact that she [instructor] had the kind of easier options certainly helped (...) because you’re not putting anymore strain on yourself by trying to do them, the easier option was there, no, that was really, really good (...) so, again, having that chair aspect and the fact that the instructor encouraged it if you were in pain and not kind of diminished the fact that you had to use it, it was very much encouraged if you were in pain (...) that kind of turned it into a positive more than a negative.” (Participant 11)

“I’ve had both of my knees replaced and one of the things with having your knees replaced is you’re not actually allowed to kneel (...) I don’t like feeling different (...) and it was fine, you know, the fact that the chair was there.” (Participant 14)

3.3.3.1.4 Permission

Participants discussed that they felt they were given permission to take time out and be present in the moment, and this subsequently resulted in them feeling more able to give themselves permission to do so outside of the sessions. Participants reported that taking time out to be mindful gave them more control in their daily lives:

“(...) and I quite enjoyed the fact that it’s OK to sometimes feel a little bit like you need to be pulled back, because for somebody else to give you that instruction, it also gives you permission to switch off and be able to be part of that moment rather than your brain wondering off somewhere else (...) Even though you’re not actually in the positions [in day

to day life], sometimes you can just reflect back and have that moment to just stand still and breathe, to think and then move on. I think you manage situations very differently when you have that thought and mindset (...) you manage it in a much better way. What I call early intervention” (Participant 8)

3.3.3.2 Reported Benefits

Participants discussed a wide range of benefits that they experienced as a result of taking part in the yoga intervention. This theme was split into four subthemes: (1) physical benefits, (2) behavioural benefits, (3) emotional benefits, and (4) psychological benefits.

3.3.3.2.1 Physical benefits

Physical benefits were amongst the most reported by participants, with many people reporting improvements in pain. One participant stated that they now use yoga instead of medication to manage their pain:

“[Previously] if I don't want to feel something I just use some painkillers. Now, I just want to tend to whatever pain it is I'm having through exercise and not through pain killers. I just want to do it in a natural form, and I feel it's more healthier than taking a lot of drugs to combat pain or whatever.” (Participant 4)

Participants also reported improvements in their sleep, their appetite, and some experienced weight loss:

“Overall, I think it empowered me to do something completely different (...) and afterwards [following the yoga session], I had a better sleep. I don't sleep very well so that gave me clarity and that clear mind, where I was more rested, and I think that was really important for my wellbeing.” (Participant 8)

“I remember at some point, like before the whole yoga thing, I don't eat well. Like I don't feed well. I find it very difficult to eat (...) after the first yoga session, immediately when I finished like this, there was this appetite to eat.” (Participant 4)

“I realise my weight is slightly lower now so it's more like it's over the weeks now I think it's [yoga] helping me manage my weight too.” (Participant 1)

Some participants discussed that taking part in the yoga sessions helped them become more aware of their inner experience which increased their self-knowledge:

“(...) when I engage in this activity [yoga], I realise it helps me really monitor how my heart really works, like how it beats. Like if it's faster or, and sometimes, and also when I'm in a

very tense situation there is a way my body tends to respond to it too. It is really...this experience actually helped me to know what is really going on within. Sometimes, I feel like my entire system is just destabilised but with this form of yoga, it helps me to monitor my body system.” (Participant 9)

3.3.3.2.2 Behavioural benefits

Although home practice was not discussed during the intervention, the majority of participants reported that they continued to practice yoga outside of sessions. All participants reported that they would like to continue to practice yoga going forwards, and there was an overall preference for online sessions. Participants discussed that the reasons behind wanting to continue to practice yoga were the observed increases in benefits:

“I have a routine every morning, a breathing routine every morning to, you know, try to practice some of the exercises”. (Participant 2)

“I’m now looking at YouTube and listening like 30 minutes a day for some yoga, just to calm my day” (Participant 12)

“(…) I’ve been trying to do some of those practices, some of those exercises. Yeah, just the exercises and the postures and the techniques on my own, ever since the class came to a close (...) it’s something I’d like to, you know, actively do” (Participant 6)

Some participants reported an improvement in their eating behaviours which included making healthier choices and eating more regularly. An improvement in hydration was also reported. It is important to note that others did not notice this improvement however, they did not voice any concerns regarding their eating behaviours either:

“I no longer take those junks that just keep me kinda tight, you know, a lot of sugar resting in my body and all I just want to do is probably sit and lazy around, so rather I just want to stay active.” (Participant 4)

“I [now] eat at the normal time I’m supposed to eat. Breakfast, lunch and dinner. Like before, where I find it difficult to, like, eat breakfast, and then when I have lunch, I can’t also have dinner again.” (Participant 3)

“I have actually cut down my coffee intake (...) and I’ve had water in between.”
(Participant 11)

Participants reported that having greater awareness of their inner experience enabled them to regulate their emotions more effectively. In particular, many people spoke about using breathing to help them manage stressful situations:

“I think one of the things I found helpful was the part where the instructor was talking about breathing in and breathing out (...) In fact, that’s become a part of me that, regardless of any situation I find myself, I just don’t want to like, bring in stress. I don’t want to bring in emotion. What I just do is oh I breathe in and then I breathe out and then there’s this peace that comes with it.” (Participant 3)

“Previously, it wasn’t always the case previously. If I felt an emotion, I just let it run its course but right now, I believe that whenever I feel a certain type of negative emotion, I can take a deep breath, I can try and calm myself down. I can, you know, channel the energy of the negative emotions away from me and then bring it, tap into positive energy.”
(Participant 2)

Some participants also spoke about being more aware of the impact that their responses may have on others. This illustrates the third flow of compassion (compassion to others) (Gilbert, 2014):

“(...) it’s kind of been noticed by the people around me. I take things more into consideration before giving a response.” (Participant 2)

“(...) and even sometimes now, if I get a stressful email, I’ll take a couple of minutes to go: okay, how do you want to respond to this without coming across in the wrong way.”
(Participant 11)

3.3.3.2.3 Emotional benefits

Participants described feeling “relieved” of stress, and they reported that the intervention had a calming effect on them:

“I felt relieved to be honest (...) it helped in stress relief, and I was looking forward to the next session.” (Participant 12)

“I would feel a sudden calm [during the yoga sessions].” (Participant 6)

3.3.3.2.4 Psychological benefits

Many participants reported that engaging in the yoga sessions helped to improve their mental clarity and, similarly to the above subthemes, they subsequently felt more in control over their inner experience:

“It helps me clear my mind easily and also it helps me to focus on things that matter”
(Participant 9)

“I felt like I could tap into my, you know, into my inner consciousness. And then, you know, exert some degree of control over it”. (Participant 2)

3.3.3.3 Increased awareness, and encouragement, of yoga practice

Participants felt that there should be more awareness of yoga generally, and they reported that they would recommend the intervention to others, following surgery. Participants also felt strongly that yoga would be a beneficial addition to the bariatric care package:

“I think it’s going to be very effective because at the end of the program you realise that it’s something that could be introduced to the health sector, you know, and through government agencies, health services, it could help people like myself. It’s you know, going to be very effective and worthwhile.” (Participant 9)

“I mean one of the questions in the survey was do you think that yoga as part of your bariatric surgery aftercare would have been, or even your pre care, would have been useful? 100%”. (Participant 11)

3.3.3.4 Reasons for engagement in the study

The main reason cited by participants for their engagement in the study was the desire to engage in a form of physical activity with the aim of weight loss. This is in line with existing research which has found that initial motivations for engagement in yoga practice amongst Western populations tend to be physical (Park et al., 2014):

“I needed something to engage myself in, something that was going to improve my physique.” (Participant 6)

Although initial motivations for engagement in yoga practice tend to be physical, for many, spirituality becomes their primary reason for maintaining the practice (Park et al., 2014), and this trend was found amongst the participants in this study:

“I realised, because I actually attended all the four sessions, I followed every bit of what was being done and I also practiced them, and I tried to create time on a daily basis to you know, take my time more on the meditation” (Participant 9)

3.3.3.5 Difficulties following surgery

Some participants discussed difficulties in maintaining healthy eating habits due to busy lives, and that this led to weight gain and associated distress. These experiences align with existing research (Tolvanen et al., 2022).

“(...) since working from home the last year and a half, out of the almost five stone that I lost in weight, I’ve gained back two. Which is obviously a bit frustrating” (Participant 11)

“I’d go to work (...) and then I’d come home, and I’d have to cook. And then I’d watch the same TV programmes every single day, and then I’d faff about on my phone and I don’t ever concentrate. And you know, and then I don’t eat properly. And it was just this vicious circle (...) I’ve put on a bit [of weight] which I’m not happy about” (Participant 14)

3.3.3.6 Difficulties in sessions

The majority of participants reported that they did not encounter any difficulties during the intervention however, it is important to acknowledge that some difficulties were reported by others. This information can be used to inform the development of future interventions. Some participants reported that they found some physical poses challenging, and a couple of participants encountered technical issues:

“I found it difficult to execute some of the poses because I wasn’t flexible enough”
(Participant 6)

“The problems I had was, because I’m not so familiar with teams as I am with Zoom, I could only put her [instructor] in the corner of my phone. I tried to stream it to my TV, but it wouldn’t do that. Then I tried to make her bigger and to move the rest of the screen, but it wouldn’t allow me. And then the volume was quite intermittent, sometimes depending on the movement she was doing I struggled to hear and look at what she was doing.”
(Participant 8)

3.3.4 Quantitative Results

A paired-samples t-test indicated that scores on the Unconditional Permission to Eat subscale of the IES-2 were significantly higher on the post-test ($M = 2.90$, $SD = 0.47$) compared to the pre-test ($M = 2.32$, $SD = 0.42$), $t(39) = 6.12$, $p < .001$.

A significant improvement was also found on the Motivated Action subscale of the BCQ where scores on the post-test ($M = 3.93$, $SD = 0.67$) were significantly higher than at pre-test ($M = 3.70$, $SD = 0.81$), $t(39) = 2.44$, $p = .019$.

No other statistically significant improvement was found. Please see Table 3 for the t-test results and Table 4 for the Wilcoxon signed-rank test results.

Table 3.3*T-test Results*

Variable	Pre-test M (SD)	Post-test M (SD)	T-value	P-value	Variable	Pre-test M (SD)	Post-test M (SD)	T-value	P-value	Variable	Pre-test M (SD)	Post-test M (SD)	T-value	P-value
IES-2					BCQ					DERS-16				
UPE	2.32 (0.42)	2.90 (0.47)	6.12	< .001	MA	3.70 (0.81)	3.93 (0.67)	2.44	.019	Non- acceptance	9.18 (2.72)	9.33 (2.72)	-0.25	.801
RHSC	3.74 (0.61)	3.61 (0.64)	-1.38	.176	BK	3.37 (0.92)	3.57 (0.64)	1.39	.173	Goals	9.90 (2.49)	9.80 (1.92)	0.18	.860
BFCC	3.85 (0.70)	3.93 (0.53)	0.73	.473	CH	3.65 (0.77)	3.71 (0.57)	0.53	.598	Impulse	8.53 (2.98)	8.40 (2.88)	0.23	.819
Global Score	3.23 (0.31)	3.21 (0.29)	-0.36	.722	Global Score	3.55 (0.73)	3.71 (0.50)	1.63	.112	Strategies	15.30 (4.24)	14.93(3.93)	0.45	.658
										Clarity	5.35 (1.98)	5.90 (1.75)	-1.49	.142
										Global Score	48.18 (12.13)	48.35(9.98)	-0.07	.944

Note. IES-2 = Intuitive Eating Scale – 2 (Tylka & Kroon Van Diest, 2013); UPE = Unconditional Permission to Eat; RHSC = Reliance on Hunger and Satiety Cues; BFCC = Body-Food Choice Congruence; BCQ = Body Compassion Questionnaire (Beadle et al., 2021); MA = Motivated Action; BK = Body Kindness; CH = Common Humanity; DERS-16 = Difficulties in Emotion Regulation Scale – 16 (Bjureberg et al., 2016).

Table 3.4*Wilcoxon Signed-Rank Test Results*

Variable	Pre-test M (SD)	Post-test M (SD)	Z-value	P-value
IES-2 - EPR	2.88 (0.45)	2.87 (0.49)	-0.677	.498
WSSQ – Global Score	38.35 (6.39)	38.50 (7.84)	- 1.223	.221

Note. IES-2 = Intuitive Eating Scale – 2 (Tylka & Kroon Van Diest, 2013); EPR = Eating for Physical Rather than Emotional Reasons; WSSQ = Weight Self Stigma Questionnaire (Lillis et al., 2010).

3.3.4.1 Feedback form

Please see Appendix U for the feedback form and Appendix V for feedback form results.

Overall, 39 out of 40 participants completed the feedback form. Most participants found the intervention beneficial to their wellbeing. Participants scored their responses on a Likert scale from 0 (not at all beneficial) to 10 (extremely beneficial). The mean score was 8.46 ($SD = 1.61$) with a range of 2-10. Only one participant scored “2” and they left a comment to explain their answer:

“I just practically missed the sessions (...) more communication would have been helpful (...)”

Participants found the online mode of the intervention very beneficial ($M = 8.69$; $SD = 1.10$), and they quoted convenience as the most beneficial aspect. 97.4% of participants would consider participating in yoga long-term (1 person was unsure). 97.4% of people would recommend the intervention to others and 1 person selected “no” however, all comments were positive therefore, this may have been an error.

97.4% of participants thought it would be useful to have this intervention as part of an aftercare package for bariatric surgery patients:

“As a bariatric patient I feel this would have beneficial to do from straight after the surgery as I feel getting into good practices is the best way to work. It may have helped me to not gain some of the weight back.” (anonymous)

“It could really help patients adjust to lifestyle changes, maintain healthy habits, and manage any challenges that arise after surgery.” (anonymous)

61.5% of participants would have considered engaging in this intervention if it was available in the NHS before choosing to undergo bariatric surgery:

“I would have considered it because I went through different options of weight loss before the surgery. None of those options lived up to expectations and I feel like Hatha Yoga might have just been the thing.” (anonymous)

33.4% of participants were unsure whether they would have considered engaging in this intervention if it was available in the NHS before choosing to undergo bariatric surgery:

“I don’t know how much specific benefit it would have in terms of the decision-making process. But depending on the way it was delivered yoga might help people deal with their weight issues. Although that said, I think by the time people need bariatric surgery it might be too late!” (anonymous)

5.1% (2 participants) reported that they wouldn’t have considered it, with one participant stating: “cost implication”, and the other participant did not comment.

3.3.4.2 EPYQ

The dimensions of yoga which featured most throughout the intervention were: body awareness ($M = 5$), breathwork ($M = 4.93$), acceptance/ compassion ($M = 4.73$), meditation and mindfulness ($M = 4.71$), yoga philosophy ($M = 4.64$), and mental and emotional awareness/ release ($M = 4.6$). The subscales are scored from 1 (not at all) to 5 (a very large amount). Please see Appendix Q for session-by-session EPYQ scores.

3.4 Discussion

3.4.1 Summary of findings

The main aim of this study was to explore whether yoga has the potential to be a feasible and acceptable intervention for the post-bariatric surgery population. Overall, participants rated the intervention highly in terms of its positive impact on their wellbeing, and the convenience of access. The vast majority reported that they would consider engaging in the intervention long-term, and that they would recommend the intervention to others. Similarly, all but one participant reported that they felt it would be beneficial to include yoga as part of an aftercare package for bariatric surgery patients, and more than half felt that if yoga was available as a treatment option in the NHS, they would have tried it before considering bariatric

surgery. Therefore, the feedback implies that the yoga intervention was experienced as acceptable and beneficial by the participants. The feedback also suggests that further exploration into the integration of yoga into the bariatric pathway is warranted.

The recruitment rate met the initial target which would suggest that yoga is appealing to the post-bariatric population. It is worth noting that 11.8% of the participants who signed up to the study did not meet criteria to take part based on having had undergone surgery less than two years ago. This suggests that the intervention was also appealing to people who had undergone surgery more recently. This supports the feedback from the current sample who reported that yoga should be considered part of the bariatric aftercare package. Out of the 60 participants invited to take part, 66% attended the first yoga session. Due to time constraints, it was not possible to follow-up on the participants who did not attend. Review of participant characteristics could have produced valuable insights therefore, it is recommended that future follow-up research investigates possible reasons for non-engagement.

Overall, out of the 40 participants who attended session1, 90% attended the first three sessions however, there was a 19.5% dropout between the third and fourth session. This resulted in an overall dropout rate of 27.5%. Although participants received two reminders (the first reminder was sent one week before the start of the intervention, and the other was sent a day before the intervention), it may have been beneficial for reminders to be sent before each session to increase participation. This should be considered in future research.

The intervention in this study was specifically designed to target the “yamas” and “niyamas” limbs (please see EPQY in Appendix Q and session plans in Appendix T). The main insights which emerged from the interview themes were consistent references to the benefit of how yoga practices were conducted, that is the “yamas” and “niyamas”. This provides preliminary support for the hypothesis that psychological benefits are the results of yoga ethics (“yamas” and “niyamas”) rather than the physical practices, or bottom-up mechanisms of change (Bennetts, 2022).

One of the key themes that emerged from the interviews was “compassion”. Based on findings, the most suitable conceptualisation would be based on Gilbert’s theory (Gilbert, 2014). Gilbert argues that compassion involves the ability to notice and make sense of suffering, and a commitment to learn and apply the skills and wisdom that will help to alleviate and prevent it (Gilbert, 2014). Compassion can flow in three directions: compassion from others, compassion towards others, and compassion towards our selves (Gilbert, 2014).

The qualitative findings illustrate all three flows; firstly, the participants indicated that they received compassion from the instructor by reporting that they valued the proposed

modifications which were aimed at helping participants engage in the practice by alleviating discomfort. Participants also reported that they felt they were given permission by the instructor to focus on themselves for the duration of the practice. Gilbert argues that compassion from others can facilitate self-compassion as people learn that they are worthy of kindness (Gilbert, 2009). Indeed, the findings show that participants were able to accept the difficulties encountered during the practice and they implemented the suggested adaptations to alleviate these difficulties to help them engage in the practice. Some participants also demonstrated compassion towards others by reporting that they were becoming more mindful of how they respond to others. According to Gilbert, compassion from others helps to activate the soothe system which helps people feel safe and connected, and results in people being more likely to respond with empathy and compassion towards others (Gilbert, 2009).

The quantitative findings align with the qualitative findings as they showed an increase on the motivated action subscale of the BCQ at post-intervention. Motivated action measures the urge to act compassionately towards one's body (Beadle et al., 2021). It is important to note that although statistically significant improvement was not found on the other subscales of the BCQ, or the overall score, all scores were higher at post-intervention thus suggesting that there may be potential for improvement with increased duration of yoga. Although causal conclusions cannot be drawn from these findings, they provide preliminary support for the existing theories of yoga which suggest that yoga could improve self-compassion (Bennetts, 2021; Kishida et al., 2018). These findings warrant further exploration, and it is recommended that future research employs more rigorous study designs to allow for causal inference between yoga and self-compassion.

Participants also reported improvements in emotion regulation thus providing preliminary support for the hypothesis that yoga can improve emotion regulation (Bennetts, 2022). These findings align with the definition of “brahmacharya” (sub-limb of “yamas”) which refers to the regulation of energy (Fox et al., 2024). Brahmacharya has been postulated to impact emotion regulation (Bennetts, 2022). An improvement in emotion regulation could also be a result of practicing pranayama (breath regulation) which is said to regulate physiological systems involved in emotional experience, and to increase awareness of inner experience (Bennetts, 2022). Pranayama was one of the limbs which featured most during the intervention and participants reported practicing it outside of the sessions. This suggests that pranayama could be a critical component to include when designing interventions for the post-bariatric surgery population for which emotion regulation may be an issue.

Participants also discussed that they noticed improvements in self-awareness, which is consistent with the definition of “svadhyaya” (sub-limb of “niyamas”) which translates to “self-

study” regarding one’s thoughts, behaviours, and psychological states (Fox et al., 2024). These experiences are also consistent with the definition of “asteya” (sub limb of “yamas”) which refers to “non-stealing” of emotions or experiences (Fox et al., 2024). Both sub-limbs have been postulated to improve interoception (Bennetts, 2022).

There was also a reported improvement in healthy eating and hydration which could be attributed to “saucha” (sub-limb of “niyamas”) which relates to cleanliness and purity (Schmidt et al., 2021). Quantitative findings also showed a significant improvement in unconditional permission to eat, at post-intervention. It is important to note that this subscale had the lowest scores on the IES2 at pre-intervention which would suggest greater difficulties in this area. Previous research suggests that lower scores on the UPE subscale are associated with greater instances of binge eating (Duarte et al., 2016). One explanation for this could be that because bariatric patients are advised by healthcare professionals to eat in a certain way following surgery (which usually involves restriction of different foods), they feel they lack permission to eat certain foods which subsequently leads to cravings and urges to eat foods that they have been restricting (Natvik et al., 2014). Indeed, food restriction has been shown to be a risk factor for binge eating (Waller et al., 2019).

An improvement in UPE has previously been linked to self-compassion whereby adopting a self-compassionate stance to difficult internal experiences related to the body has been shown to facilitate more intuitive eating (Schoenefeld & Webb, 2013). There is also current preliminary evidence which supports the hypothesis that higher levels of interoceptive awareness could result in higher levels of intuitive eating (Neukirch et al., 2019; Robinson et al., 2021). The findings of the current study are in line with existing research which shows an association between yoga practice and healthy eating (Telles et al., 2023; Watts et al., 2018). Taken together, “saucha” may be a key niyama to include and investigate in future interventions for this population. Future research should employ mediation designs to allow for inferences of causality to be made between the highlighted yoga limbs and the psychological processes postulated to be targeted by them.

Although the quantitative findings did not find a significant improvement in emotion regulation, it is important to note that pre-intervention scores on the DERS-16 were in the “low” range (except for the Clarity subscale which was “average”) suggesting that the sample did not experience difficulties with emotion regulation. The non-significant post-intervention results could subsequently be due to the initial low scores. It is also possible that participants may have underreported their difficulties because the items listed on the questionnaire tend to be stigmatised in our society. On the other hand, it could be argued that the DERS-16 was not the most appropriate measure to use with this population where there is a tendency to use food to

avoid and suppress emotions (Chesler, 2012). Upon reflection, the Emotional Eater Questionnaire (EEQ) (Garaulet et al., 2012) may be a more appropriate tool to use as it measures the link between emotion states and food intake. Future research should consider using the EEQ to understand whether emotional eating in this population would be better captured by this measure.

Participants also reported physical benefits as a result of engaging in the study, and these included reduced pain and improved sleep. These findings are in line with previous research (Bankar et al., 2013; Büssing et al., 2012; Tekur et al., 2012; Wang et al., 2020). It is argued that careful body movement coupled with mindfulness both strengthens spinal and abdominal muscles and promotes deeper relaxation thus resulting in reduced pain (Tekur et al., 2012). Sleep improvements are argued to be achieved through (1) engagement in physical postures which can cause exertion thus resulting in improved sleep, (2) breathing exercises which can help to strengthen the upper airway muscles resulting in greater oxygen intake and less sleep disturbances caused by snoring, and (3) a decrease in physiological arousal can also lead to less sleep disturbance (Bankar et al., 2013).

It is important to note that this study did not measure changes in pain or sleep therefore, this should be a consideration for follow-up research. The Pittsburgh Sleep Quality Index (PSQI) may be considered to measure changes in sleep; it has been validated for use with clinical populations, and it has shown good reliability (Shahid et al., 2011). To measure changes in pain, the Short-Form McGill Pain Questionnaire-2 should be considered which has been shown to be useful in patients with chronic pain, including low back pain (Dworkin et al., 2009; Trudeau et al., 2012) which was reported by participants in this study.

As a result of the reported benefits, participants stated that they continued to practice yoga outside of the sessions and that it was something that they would continue with. Research shows that initial motivations to engage in yoga practice in the West are often physical however, they often progress to more spiritual reasons (Park et al., 2014). This is in line with Gard et al.'s theory whereby they argue that regular yoga practice is motivated by ethical beliefs which promote benefits for oneself and others, including direct reward resulting from the practice (Gard et al., 2014). Future research would benefit from collecting follow-up measures to investigate whether there is an objective increase in wellbeing long-term.

Overall, the yoga intervention was deemed to be acceptable and beneficial amongst the study sample, and the results provide preliminary support for the theory of change in yoga (Bennetts, 2022) applied to the post-bariatric population therefore, follow-up research is warranted.

3.4.2 Clinical implications

Overall, the findings of this study suggest that yoga may be a feasible intervention for the post-bariatric population. In order for the field to progress, more rigorous research is needed which could compare the effectiveness of yoga against traditional talking therapies. In the meantime, it is recommended that mental health services consider piloting yoga pathways. Services could also consider liaising with third sector organisations for joint working which might require less resource thus resulting in fewer costs and potentially less delays. Based on the findings of the current study, yoga interventions for the post-bariatric population should consider observing the yamas and niyamas throughout the practices offered.

It is also recommended that services consider holistic assessment and intervention for post-bariatric surgery clients. Practitioners could consider incorporating physical practices within existing therapies, such as soothing rhythm breathing as part of CFT (Gilbert, 2014). This is supported by British Psychological Society (BPS) who report that the NHS is recognising the interconnectedness of physical and mental health, and that there is a need for more integrated services (Mason et al., 2018). The BPS propose that this could be implemented through clinicians offering simple yogic breathing and meditation techniques in their clinical practice (Mason et al., 2018). Clinicians working psychologically with post-bariatric patients could also consider using compassion and acceptance-based approaches such as ACT and CFT, as there are parallels between the ethos and practices of these therapies and yoga (Bennetts, 2022).

Participants in the current study voiced a preference for online yoga thus this would be a recommended mode of delivery. This could offer practical benefits for services including cost, resources, and logistics. Facilitators should consider sending out instructions for the online platform and perhaps demonstrating basic functions at the start of the first session to minimise the likelihood of technical issues. It is also recommended that an assistant is present in all sessions to manage any technical issues or messages from participants. It is recommended that participants are given the option to modify poses to make them easier, and that the use of a chair as a supporting prop is encouraged.

3.4.3 Strengths and limitations

The Medical Research Council has recently updated the Framework for Developing and Evaluating Complex Interventions (Skivington et al., 2021) therefore, the strengths and limitations of this study were considered in light of this guidance. “Context” is one of the six core elements of the guidance (Skivington et al., 2021) and it is something that has been considered throughout this study. The intervention was designed to take place online and participants were not required to have their cameras switched on during the intervention. This

aimed to increase uptake of the intervention and it was guided by research which found high levels of self-stigma amongst the population (Gastón-Panthaki et al., 2023). The recruitment reached the target number and the mode of the intervention was reported to be convenient and beneficial by the participants however, the findings are limited to this context only. Furthermore, an online intervention would have been less accessible to those with internet poverty.

Secondly, the study adhered to the “programme theory” guideline (Skivington et al., 2021) whereby the development of the study was guided by Bennetts’ (2022) theory of change in yoga practice. This meant that the findings provide insight into how the intervention may have produced the reported benefits. In line with the guidance (Skivington et al., 2021), “stakeholders”, which included healthcare professionals and members of the post-bariatric surgery population, were involved throughout the development of the study. This helped to ensure that the study would be acceptable to the target population. To address the “uncertainty” (Skivington et al., 2021) surrounding the impact of yoga on the post-bariatric population, a mixed methods design was chosen to provide qualitative information to help inform future decisions regarding intervention refinement. An important “refinement” (Skivington et al., 2021) to the intervention included the researcher being present during the intervention to support with technical issues.

“Economic considerations” (Skivington et al., 2021) were not formally analysed however, they were taken into consideration during study development. The online mode of the intervention meant that costs associated with studio rental and travel expenses would have been eradicated. Other benefits include time savings and convenience as well as environmental benefits associated with no travel.

Another major strength of this study is its sample which was male-dominant and ethnically diverse. Currently, males and people from ethnic minority backgrounds have been found to be less likely to access traditional talking therapies (Alam et al., 2024; Liddon et al., 2018) and this study suggests that online yoga may be a more accessible intervention for these populations.

One of the limitations of the current study includes the interview selection process whereby participants were selected on a first come, first served basis. This may have introduced bias into the findings whereby those with particular narratives may have responded more eagerly, resulting in alternative narratives being missed. Further limitations of the current study include a lack of a control group, and a short duration of the intervention. The lack of a control group means that it is not possible to determine whether the reported changes were due to the intervention or other external factors. More rigorous research is needed to increase confidence in the effects of the intervention.

Although an EPYQ was completed to help objectively report the yoga intervention, it was completed by the researcher thus the scores could be biased. It has been recommended that the EPYQ should be completed by an independent, trained rater to ensure reliability and validity (Park et al., 2018) therefore, this should be a consideration for future research.

Lastly, all of the participants were UK-based therefore, findings and recommendations are limited to the UK.

3.4.4 Future research

Future research considerations have been discussed throughout however, it is important to highlight the need for more rigorous research in the form of randomised controlled trials to reduce bias, and to increase certainty in the observed effects of the intervention. Future designs should also allow for inference regarding the specificity of components of yoga such as longitudinal designs with multiple measurement where mediation could be used to infer mechanisms of change.

3.5 Conclusion

Overall, findings from the present study suggest that yoga has the potential to be an acceptable and feasible intervention for the post-bariatric population thus warranting further exploration. The findings provide preliminary support for the proposed mechanisms of change targeted by yoga (Bennetts, 2022), applied to the post-bariatric population. Findings also suggest that men and people from ethnic minority backgrounds accessed the study more readily which is encouraging as it suggests that yoga could have the potential to help improve access to support for underrepresented groups in traditional talking therapies. In order for the field to progress, more rigorous research is needed to help increase confidence in the observed effects of the intervention. This, in turn, could lead to more reliable advice regarding the clinical applications of yoga for the post-bariatric surgery population.

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Appendix A CLARIFY Guidelines (Ward et al., 2022)

Consensus-generated 21-item CLARIFY checklist for the reporting of yoga research

No.	THEME: Subtheme	Item
1	TITLE	
1a	<i>Succinctly describe the yoga intervention.</i>	Include the word 'yoga' in the publication title.
2	THEORY	
2a	<i>Describe any rationale, theory or goal of the elements essential to the yoga intervention.</i>	Describe why the specific population was included in the study.
3	ACTIVITIES	
3a	<i>Describe the yoga practices or activities used in the intervention.</i>	Describe the duration of yoga practices within yoga session (eg, 20 min postures, 10 min breathing).
3b		Describe the type of yoga practices included (eg, postures/asana, breathing/pranayama, meditation, relaxation).
4	EXPERTISE	
4a	<i>Describe the expertise, background and training of those providing the yoga intervention.</i>	Describe the qualifications of the yoga instructor(s).
5	DELIVERY	
5a	<i>Describe how the yoga intervention was delivered (eg, class, video/audio) and whether it was provided individually or in a group.</i>	Describe the teaching approach including: visual demonstration, verbal guidance and/or hands on assistance.
6	DOSE	
6a	<i>Describe the number of times the yoga intervention was delivered and over what period,</i>	Describe the duration of each yoga session (in minutes).
6b	<i>including the number of sessions, their schedule and their duration and intensity.</i>	Describe the duration of the yoga intervention (eg, over 8 weeks).
6c		Describe the frequency of yoga sessions (eg, two times per week).
6d		Describe the number of yoga sessions.
7	HOME PRACTICE	
7a	<i>Describe aspects of home practice if any.</i>	Describe the duration and frequency of home practice (if any).
7b		Report whether yoga was available to participants during the follow-up period (if relevant), and list any recommendations made for home practice dose.
7c		Describe if and how adherence to home practice was measured.
8	PROTOCOL CHANGES	
8a	<i>If the yoga intervention was modified during the course of the study in ways not described in the</i>	Describe any changes to the yoga protocol during the study.
8b	<i>protocol, please describe the changes.</i>	Describe the rationale for changes to the yoga protocol during the study.
9	PARTICIPANT ADHERENCE	
9a	<i>If adherence to the yoga intervention was assessed, describe how and by whom and what, if any</i>	Describe if and how class/session attendance was measured.
9b	<i>strategies were used to maintain or improve adherence.</i>	Describe any strategies used to promote practice adherence.
10	INSTRUCTOR FIDELITY	
10a	<i>Describe the extent to which the yoga intervention was delivered as planned.</i>	Describe the assessment of protocol fidelity.
10b		Describe the reasons for deviation from study plan.
10c		Describe any differences between proposed programme and actual programme delivery.
10d		Describe when protocol was modified.

Appendix B Complementary Therapies in Clinical Practice Guide for Authors

Your paper your way

We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

The Editor of *Complementary Therapies in Clinical Practice* invites authors to submit articles on all aspects of individual therapies, international news, book reviews, multimedia reports and correspondence.

As a service to the community, this journal makes available online the accepted manuscripts as soon as possible after acceptance. At this stage, the author's accepted manuscript (in both full-text and PDF) is given a Digital Object Identifier (DOI) and is fully citable, and searchable by title, author(s) name and the full-text. The article also carries a disclaimer noting that it is an unedited manuscript which has not yet been copyedited, typeset or proofread. When the fully copyedited version is ready for publication, it simply replaces the author accepted manuscript version.

Page charges

This journal has no page charges.

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print

Graphical Abstracts / Highlights files (where applicable)

Supplemental files (where applicable)

Further considerations:

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed

For further information, visit our [Support Centre](#).

Ethics in publishing

Please see our information on [Ethics in publishing](#).

Studies in humans and animals

If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with [The Code of Ethics of the World Medical Association](#) (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the [Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals](#) and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms [sex and gender](#) should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

Complementary Therapies in Clinical Practice does not accept studies using animal models for experimentation or investigation. Please note CTCP does, however, consider studies that involve animals as part of a therapeutic intervention. This may be described by terms including animal assisted intervention; animal assisted activities; animal assisted therapy and should comply with the [ARRIVE guidelines](#) and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, [EU Directive 2010/63/EU for animal experiments](#), or the National Research Council's [Guide for the Care and Use of Laboratory Animals](#) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Declaration of interest

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double anonymized) or the manuscript file (if single anonymized). If there are no interests to declare then please state this: 'Declarations of interest: none'. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is

important for potential interests to be declared in both places and that the information matches. [More information](#).

Declaration of generative AI in scientific writing

The below guidance only refers to the writing process, and not to the use of AI tools to analyse and draw insights from data as part of the research process.

Where authors use generative artificial intelligence (AI) and AI-assisted technologies in the writing process, authors should only use these technologies to improve readability and language. Applying the technology should be done with human oversight and control, and authors should carefully review and edit the result, as AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. AI and AI-assisted technologies should not be listed as an author or co-author, or be cited as an author. Authorship implies responsibilities and tasks that can only be attributed to and performed by humans, as outlined in Elsevier's [AI policy for authors](#).

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Statement: During the preparation of this work the author(s) used [NAME TOOL / SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication

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Use of inclusive language

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blocklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Reporting sex- and gender-based analyses

Reporting guidance

For research involving or pertaining to humans, animals or eukaryotic cells, investigators should integrate sex and gender-based analyses (SGBA) into their research design according to funder/sponsor requirements and best practices within a field. Authors should address the sex and/or gender dimensions of their research in their article. In cases where they cannot, they should discuss this as a limitation to their research's generalizability. Importantly, authors should explicitly state what definitions of sex and/or gender they are applying to enhance the precision, rigor and reproducibility of their research and to avoid ambiguity or conflation of terms and the constructs to which they refer (see Definitions section below). Authors can refer to the [Sex and Gender Equity in Research \(SAGER\) guidelines](#) and the [SAGER guidelines checklist](#). These offer systematic approaches to the use and editorial review of sex and gender information in study design, data analysis, outcome reporting and research

interpretation - however, please note there is no single, universally agreed-upon set of guidelines for defining sex and gender.

Definitions

Sex generally refers to a set of biological attributes that are associated with physical and physiological features (e.g., chromosomal genotype, hormonal levels, internal and external anatomy). A binary sex categorization (male/female) is usually designated at birth ("sex assigned at birth"), most often based solely on the visible external anatomy of a newborn. Gender generally refers to socially constructed roles, behaviors, and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society. Sex and gender are often incorrectly portrayed as binary (female/male or woman/man) and unchanging whereas these constructs actually exist along a spectrum and include additional sex categorizations and gender identities such as people who are intersex/have differences of sex development (DSD) or identify as non-binary. Moreover, the terms "sex" and "gender" can be ambiguous--thus it is important for authors to define the manner in which they are used. In addition to this definition guidance and the SAGER guidelines, the [resources on this page](#) offer further insight around sex and gender in research studies.

Author contributions

For transparency, we require corresponding authors to provide co-author contributions to the manuscript using the relevant CRediT roles. The [CRediT taxonomy](#) includes 14 different roles describing each contributor's specific contribution to the scholarly output. The roles are: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; and Writing - review & editing. Note that not all roles may apply to every manuscript, and authors may have contributed through multiple roles. [More details and an example](#).

Authorship

All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Clinical trial results

In line with the position of the International Committee of Medical Journal Editors, the journal will not consider results posted in the same clinical trials registry in which primary registration resides to be prior publication if the results posted are presented in the form of a brief structured (less than 500 words) abstract or table. However, divulging results in other circumstances (e.g., investors' meetings) is discouraged and may jeopardise consideration of the manuscript. Authors should fully disclose all posting in registries of results of the same or closely related work.

Randomised controlled trials

Quantitative experimental studies should be double-blind randomised controlled trials with an appropriate placebo or sham control condition that prevents the participants from identifying which group they have been allocated to. In addition, a third arm for a non-intervention control group, or treatment-as-usual control group is a valuable addition. Any other quantitative design will only be considered if it has been fully justified and explained.

Systematic reviews and meta-analyses

Systematic reviews and meta-analyses should be registered in advance of the work being undertaken with an appropriate agency, e.g. PROSPERO, OSF or INPLASY, and the registration number should be given in the manuscript.

Reporting clinical trials

Randomized controlled trials should be presented according to the CONSORT guidelines. At manuscript submission, authors must provide the CONSORT checklist accompanied by a flow diagram that illustrates the progress of patients through the trial, including recruitment, enrolment, randomization, withdrawal and completion, and a detailed description of the randomization procedure. The [CONSORT checklist and template flow diagram](#) are available online.

Registration of clinical trials

Registration in a public trials registry is a condition for publication of clinical trials in this journal in accordance with [International Committee of Medical Journal Editors](#) recommendations. Trials must register at or before the onset of patient enrolment. The clinical trial registration number should be included at the end of the abstract of the article. A clinical trial is defined as any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects of health outcomes. Health-related interventions include any intervention used to modify a biomedical or health-related outcome (for example drugs, surgical procedures, devices, behavioural treatments, dietary interventions, and process-of-care changes). Health outcomes include any biomedical or health-related measures obtained in patients or participants, including pharmacokinetic measures and adverse events. Purely observational studies (those in which the assignment of the medical intervention is not at the discretion of the investigator) will not require registration.

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scientific English may wish to use the [Language Editing service](#) available from Elsevier's Language Services.

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Please submit the names and institutional e-mail addresses of several potential reviewers.

You should not suggest reviewers who are colleagues, or who have co-authored or collaborated with you during the last three years. Editors do not invite reviewers who have potential competing interests with the authors. Further, in order to provide a broad and balanced assessment of the work, and ensure scientific rigor, please suggest diverse candidate reviewers who are located in different countries/regions from the author group. Also consider other diversity attributes e.g. gender, race and ethnicity, career stage, etc. Finally, you should not include existing members of the journal's editorial team, of whom the journal are already aware.

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Preparation

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As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or lay-out that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

References

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

Formatting requirements

There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

Figures and tables

Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

Peer review

This journal operates a double anonymized review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. Editors are not involved in decisions about papers which they have written themselves or have been written by family members or colleagues or which relate to products or services in which the editor has an interest. Any such submission is subject to all of the journal's usual procedures, with peer review handled independently of the relevant editor and their research groups. [More information on types of peer review](#).

Double anonymized review

This journal uses double anonymized review, which means the identities of the authors are concealed from the reviewers, and vice versa. [More information](#) is available on our website. To facilitate this, please include the following separately:

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Anonymized manuscript (no author details): The main body of the paper (including the references, figures, tables and any acknowledgements) should not include any identifying information, such as the authors' names or affiliations.

Revised submissions

This section describes the revised submissions process for this journal.

Use of word processing software

Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the [Guide to Publishing with Elsevier](#)). See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

LaTeX

You are recommended to use the [latest Elsevier article class](#) to prepare your manuscript and [BibTeX](#) to generate your bibliography.

Our [Guidelines](#) have full details.

Article structure

This section describes the article structure for this journal.

Sections

Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

Introduction

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Theory/calculation

A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

Results

Results should be clear and concise.

Discussion

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Authors are encouraged to provide a short biography for each contributor. These should not exceed 75 words per person, and may each be accompanied by a small photograph.

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- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

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Highlights

Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the [example Highlights](#).

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

Abstract

Abstract should in structured format with distinct, labelled sections as follows:

Original Research: Background and Purpose; Materials and Methods; Results; Conclusion.

Reviews: Background and Purpose; Methods; Results; Conclusion.

Case Studies: Background; Patient Presentation; Conclusion.

Abstracts should not exceed 250 words.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, it is recommended to include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Units

Follow internationally accepted rules and conventions: use the international system of units (SI). If other units are mentioned, please give their equivalent in SI.

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Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y . In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by $\exp$. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

Artwork

This section describes the artwork for this journal.

Electronic artwork

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.

- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
- Please note that individual figure files larger than 10 MB must be provided in separate source files.

A detailed [guide on electronic artwork](#) is available.

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats

Regardless of the application used, when your electronic artwork is finalized, please 'save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings. Embed the font or save the text as 'graphics'.

TIFF (or JPG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.

TIFF (or JPG): Bitmapped line drawings: use a minimum of 1000 dpi.

TIFF (or JPG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.

Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.
- **Colour artwork**

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable colour figures then Elsevier will ensure, at no additional charge, that these figures will appear in colour online (e.g., ScienceDirect and other

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Figure captions

Ensure that each illustration has a caption. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References

This section describes the references for this journal.

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

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As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

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Text: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

Example: '..... as demonstrated [3,6]. Barnaby and Jones [8] obtained a different result'

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.

Examples:

Reference to a journal publication:

[1] J. van der Geer, J.A.J. Hanraads, R.A. Lupton, The art of writing a scientific article, J. Sci. Commun. 163 (2010) 51-59. <https://doi.org/10.1016/j.Sc.2010.00372>.

Reference to a journal publication with an article number:

[2] J. van der Geer, J.A.J. Hanraads, R.A. Lupton, 2018. The art of writing a scientific article. Heliyon. 19, e00205. <https://doi.org/10.1016/j.heliyon.2018.e00205>.

Reference to a book:

[3] W. Strunk Jr., E.B. White, The Elements of Style, fourth ed., Longman, New York, 2000.

Reference to a chapter in an edited book:

[4] G.R. Mettam, L.B. Adams, How to prepare an electronic version of your article, in: B.S. Jones, R.Z. Smith (Eds.), Introduction to the Electronic Age, E-Publishing Inc., New York, 2009, pp. 281-304.

Reference to a website:

[5] Cancer Research UK, Cancer statistics reports for the UK. <http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/>, 2003 (accessed 13 March 2003).

Reference to a dataset:

[dataset] [6] M. Oguro, S. Imahiro, S. Saito, T. Nakashizuka, Mortality data for Japanese oak wilt disease and surrounding forest compositions, Mendeley Data, v1, 2015. <https://doi.org/10.17632/xwj98nb39r.1>.

Reference to software:

[7] E. Coon, M. Berndt, A. Jan, D. Svyatsky, A. Atchley, E. Kikinzon, D. Harp, G. Manzini, E. Shelef, K. Lipnikov, R. Garimella, C. Xu, D. Moulton, S. Karra, S. Painter, E. Jafarov, S. Molins, Advanced Terrestrial Simulator (ATS) v0.88 (Version 0.88), Zenodo, March 25, 2020. <https://doi.org/10.5281/zenodo.3727209>.

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Appendix C Search Strategy

Database	Search strategy
AMED, APA PsychArticles, APA PsychInfo, CINAHL, MEDLINE (via EBSCO)	Yoga OR “yoga intervention*” OR “yoga practice*” OR “yoga session*” OR “yoga class*” OR “yoga therap*” OR asana OR pranayama OR meditation AND compassion* OR (self N1 compassion*) OR (self N1 kindness) OR "common humanity" OR mindful* AND Child OR child* OR "young person" OR "young people" OR "young adult*" OR adolescent* OR adolescen* OR youth OR teen*
Cochrane Library, PubMed, EMBASE (via OVID)	Yoga OR “yoga intervention*” OR “yoga practice*” OR “yoga session*” OR “yoga class*” OR “yoga therap*” OR asana OR pranayama OR meditation AND compassion* OR (self N1 compassion*) OR (self N1 kindness) OR "common humanity" OR mindful* AND Child OR child* OR "young person" OR "young people" OR "young adult*" OR adolescent* OR adolescen* OR youth OR teen*
Web of Science	Yoga OR “yoga intervention*” OR “yoga practice*” OR “yoga session*” OR “yoga class*” OR “yoga therap*” OR asana OR pranayama OR meditation AND compassion* OR (self NEAR/1 compassion*) OR (self NEAR/1 kindness) OR "common humanity" OR mindful* AND

Appendix C

	Child OR child* OR "young person" OR "young people" OR "young adult*" OR adolescent* OR adolescen* OR youth OR teen*
ProQuest	Yoga OR “yoga intervention*” OR “yoga practice*” OR “yoga session*” OR “yoga class*” OR “yoga therap*” OR asana OR pranayama OR meditation AND compassion* OR (self NEAR/1 compassion*) OR (self NEAR/1 kindness) OR "common humanity" OR mindful* AND Child OR child* OR "young person" OR "young people" OR "young adult*" OR adolescent* OR adolescen* OR youth OR teen*

Appendix D Quality Assessment Tool for Quantitative Studies (EPHPP; Thomas et al., 2004)

Selection Bias	
Q1. Are the individuals selected to participate in the study likely to be representative of the target population?	1 Very likely 2 Somewhat likely 3 Not likely 4 Can't tell
Q2. What percentage of selected individuals agreed to participate?	1 80 - 100% agreement 2 60 – 79% agreement 3 less than 60% agreement 4 Not applicable 5 Can't tell
Total Score	
Study design	
Indicate the study design	1 Randomized controlled trial 2 Controlled clinical trial 3 Cohort analytic (two group pre + post) 4 Case-control 5 Cohort (one group pre + post (before and after) 6 Interrupted time series 7 Other specify _____ 8 Can't tell
Was the study described as randomized? If NO, go to Component C.	
If Yes, was the method of randomization described? (See dictionary)	

Appendix D

If Yes, was the method appropriate? (See dictionary)	
Total Score	
Confounders	
Q1. Were there important differences between groups prior to the intervention?	1 Yes 2 No 3 Can't tell
Q2. If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	1 80 – 100% (most) 2 60 – 79% (some) 3 Less than 60% (few or none) 4 Can't Tell
Total Score	
Blinding	
Q1. Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	1 Yes 2 No 3 Can't tell
Q2. Were the study participants aware of the research question?	1 Yes 2 No 3 Can't tell
Total Score	
Data collection methods	
Q1. Were data collection tools shown to be valid?	1 Yes 2 No 3 Can't tell
Q2. Were data collection tools shown to be reliable?	1 Yes 2 No 3 Can't tell
Total Score	
Withdrawals and drop-out	
Q1. Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	1 Yes 2 No

Appendix D

	3 Can't tell 4 Not Applicable (i.e. one time surveys or interviews)
Q2. Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	1 80 -100% 2 60 - 79% 3 less than 60% 4 Can't tell 5 Not Applicable (i.e. Retrospective case-control)
Total Score	
Intervention Integrity	
Q1. What percentage of participants received the allocated intervention or exposure of interest?	1 80 -100% 2 60 - 79% 3 less than 60% 4 Can't tell
Q2. Was the consistency of the intervention measured?	1 Yes 2 No 3 Can't tell
Q3. Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	4 Yes 5 No 6 Can't tell
Analyses	
Q1. Indicate the unit of allocation (circle one)	community organization/institution practice/office individual
Q2. Indicate the unit of analysis (circle one)	community organization/institution practice/office individual
Q3. Are the statistical methods appropriate for the study design?	1 Yes 2 No 3 Can't tell

Q4. Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	1 Yes 2 No 3 Can't tell
Global Rating	

Accompanying Guide:

The purpose of this dictionary is to describe items in the tool thereby assisting raters to score study quality. Due to under-reporting or lack of clarity in the primary study, raters will need to make judgements about the extent that bias may be present. When making judgements about each component, raters should form their opinion based upon information contained in the study rather than making inferences about what the authors intended. Mixed methods studies can be quality assessed using this tool with the quantitative component of the study.

A) SELECTION BIAS

(Q1) Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely). They may not be representative if they are referred from a source (e.g. clinic) in a systematic manner (score somewhat likely) or self-referred (score not likely).

(Q2) Refers to the % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups.

B) STUDY DESIGN

In this section, raters assess the likelihood of bias due to the allocation process in an experimental study. For observational studies, raters assess the extent that assessments of exposure and outcome are likely to be independent.

Generally, the type of design is a good indicator of the extent of bias. In stronger designs, an equivalent control group is present and the allocation process is such that the investigators are unable to predict the sequence.

Randomized Controlled Trial (RCT)

An experimental design where investigators randomly allocate eligible people to an intervention or control group. A rater should describe a study as an RCT if the randomization sequence allows each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. If the investigators do not describe the allocation process and only use the words 'random' or 'randomly', the study is described as a controlled clinical trial.

See below for more details.

Was the study described as randomized?

Score YES, if the authors used words such as random allocation, randomly assigned, and random assignment.

Score NO, if no mention of randomization is made.

Was the method of randomization described?

Score YES, if the authors describe any method used to generate a random allocation sequence.

Score NO, if the authors do not describe the allocation method or describe methods of allocation such as alternation, case record numbers, dates of birth, day of the week, and any allocation procedure that is entirely transparent before assignment, such as an open list of random numbers of assignments.

If NO is scored, then the study is a controlled clinical trial.

Was the method appropriate?

Score YES, if the randomization sequence allowed each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. Examples of appropriate approaches include assignment of subjects by a central office unaware of subject characteristics, or sequentially numbered, sealed, opaque envelopes.

Score NO, if the randomization sequence is open to the individuals responsible for recruiting and allocating participants or providing the intervention, since those individuals can influence the allocation process, either knowingly or unknowingly.

If NO is scored, then the study is a controlled clinical trial.

Controlled Clinical Trial (CCT)

An experimental study design where the method of allocating study subjects to intervention or control groups is open to individuals responsible for recruiting subjects or providing the intervention. The method of allocation is transparent before assignment, e.g. an open list of random numbers or allocation by date of birth, etc.

Cohort analytic (two group pre and post)

An observational study design where groups are assembled according to whether or not exposure to the intervention has occurred. Exposure to the intervention is not under the control of the investigators. Study groups might be non-equivalent or not comparable on some feature that affects outcome.

Case control study

A retrospective study design where the investigators gather 'cases' of people who already have the outcome of interest and 'controls' who do not. Both groups are then questioned or their records examined about whether they received the intervention exposure of interest.

Cohort (one group pre + post (before and after))

The same group is pretested, given an intervention, and tested immediately after the intervention. The intervention group, by means of the pretest, act as their own control group.

Interrupted time series

A time series consists of multiple observations over time. Observations can be on the same units (e.g. individuals over time) or on different but similar units (e.g. student achievement scores for particular grade and school). Interrupted time series analysis requires knowing the specific point in the series when an intervention occurred.

Other:

One-time surveys or interviews

C) CONFOUNDERS

By definition, a confounder is a variable that is associated with the intervention or exposure and causally related to the outcome of interest. Even in a robust study design, groups may not be balanced with respect to important variables prior to the intervention. The authors should indicate if confounders were controlled in the design (by stratification or matching) or in the analysis. If the allocation to intervention and control groups is randomized, the authors must report that the groups were balanced at baseline with respect to confounders (either in the text or a table).

D) BLINDING

(Q1) Assessors should be described as blinded to which participants were in the control and intervention groups. The purpose of blinding the outcome assessors (who might also be the care providers) is to protect against detection bias.

(Q2) Study participants should not be aware of (i.e. blinded to) the research question. The purpose of blinding the participants is to protect against reporting bias.

E) DATA COLLECTION METHODS

Tools for primary outcome measures must be described as reliable and valid. If ‘face’ validity or ‘content’ validity has been demonstrated, this is acceptable. Some sources from which data may be collected are described below:

Self-reported data includes data that is collected from participants in the study (e.g. completing a questionnaire, survey, answering questions during an interview, etc.).

Assessment/Screening includes objective data that is retrieved by the researchers. (e.g. observations by investigators).

Medical Records/Vital Statistics refers to the types of formal records used for the extraction of the data.

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

F) WITHDRAWALS AND DROP-OUTS

Score **YES** if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs.

Score **NO** if either the numbers or reasons for withdrawals and drop-outs are not reported.

Score **NOT APPLICABLE** if the study was a one-time interview or survey where there was not follow-up data reported.

The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups).

G) INTERVENTION INTEGRITY

The number of participants receiving the intended intervention should be noted (consider both frequency and intensity).

For example, the authors may have reported that at least 80 percent of the participants received the complete intervention. The authors should describe a method of measuring if the intervention was provided to all participants the same way. As well, the authors should indicate if subjects received an unintended intervention that may have influenced the outcomes. For example, co-intervention occurs when the study group receives an additional intervention (other than that intended). In this case, it is possible that the effect of the intervention may be over-estimated. Contamination refers to situations where the control group accidentally receives the study intervention. This could result in an under-estimation of the impact of the intervention.

H) ANALYSIS APPROPRIATE TO QUESTION

Was the quantitative analysis appropriate to the research question being asked?

An intention-to-treat analysis is one in which all the participants in a trial are analyzed according to the intervention to which they were allocated, whether they received it or not. Intention-to-treat analyses are favoured in assessments of effectiveness as they mirror the noncompliance and treatment changes that are likely to occur when the intervention is used in practice, and because of the risk of attrition bias when participants are excluded from the analysis.

Component Ratings of Study:

For each of the six components A – F, use the following descriptions as a roadmap.

A) SELECTION BIAS

Strong: The selected individuals are very likely to be representative of the target population (Q1 is 1) **and** there is greater than 80% participation (Q2 is 1).

Moderate: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 1 or 2); **and** there is 60 - 79% participation (Q2 is 2).
'Moderate' may also be assigned if Q1 is 1 or 2 and Q2 is 5 (can't tell).

Weak: The selected individuals are not likely to be representative of the target population (Q1 is 3); **or** there is less than 60% participation (Q2 is 3) **or** selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 5).

B) DESIGN

Strong: will be assigned to those articles that described RCTs and CCTs.

Moderate: will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series.

Weak: will be assigned to those that used any other method or did not state the method used.

C) CONFOUNDERS

Strong: will be assigned to those articles that controlled for at least 80% of relevant confounders (Q1 is 2); **or** (Q2 is 1).

Moderate: will be given to those studies that controlled for 60 – 79% of relevant confounders (Q1 is 1) **and** (Q2 is 2).

Weak: will be assigned when less than 60% of relevant confounders were controlled (Q1 is 1) **and** (Q2 is 3) **or** control of confounders was not described (Q1 is 3) **and** (Q2 is 4).

D) BLINDING

Strong: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); **and** the study participants are not aware of the research question (Q2 is 2).

Moderate: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); **or** the study participants are not aware of the research question (Q2 is 2).

Weak: The outcome assessor is aware of the intervention status of participants (Q1 is 1); **and** the study participants are aware of the research question (Q2 is 1); **or** blinding is not described (Q1 is 3 and Q2 is 3).

E) DATA COLLECTION METHODS

Strong: The data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have been shown to be reliable (Q2 is 1).

Moderate: The data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have not been shown to be reliable (Q2 is 2) **or** reliability is not described (Q2 is 3).

Weak: The data collection tools have not been shown to be valid (Q1 is 2) **or** both reliability and validity are not described (Q1 is 3 and Q2 is 3).

F) WITHDRAWALS AND DROP-OUTS - a rating of:

Strong: will be assigned when the follow-up rate is 80% or greater (Q1 is 1 and Q2 is 1).

Moderate: will be assigned when the follow-up rate is 60 – 79% (Q2 is 2) **OR** Q1 is 4 or Q2 is 5.

Weak: will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q1 is No or Q2 is 4).

Not Applicable: if Q1 is 4 or Q2 is 5

Appendix E Quality Assessment Ratings for Each Study

	Beck et al	Brandao et al	Cox et al	Erkin & Aykar	Gard et al	Karmer & Cuccolo	Kearns	Uebelacker et al
Selection Bias								
Q1. Are the individuals selected to participate in the study likely to be representative of the target population?	2	3	3	3	3	3	3	2
Q2. What percentage of selected individuals agreed to participate?	1	1	1	1	1	5	2	1
Total Score	2	3	3	3	3	3	3	1
Study design								
Indicate the study design	3	1	5	5	2	5	5	1
Was the study described as randomized? If NO, go to Component C.	NO	Yes	NO	NO	NO	NO	NO	Yes
If Yes, was the method of randomization described? (See dictionary)		Yes						Yes
If Yes, was the method appropriate? (See dictionary)		No						Yes

Appendix E

Total Score	2	1	2	2	1	2	2	1
Confounders								
Q1. Were there important differences between groups prior to the intervention?	1	1	N/A	N/A	1	N/A	N/A	1
Q2. If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	2	4			2			4
Total Score	2	3	N/A	N/A	2	N/A	N/A	3
Blinding								
Q1. Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	1	1	1	1	1	1	1	1
Q2. Were the study participants aware of the research question?	3	3	1	3	3	3	3	3
Total Score	3	3	3	3	3	3	3	3
Data collection methods								
Q1. Were data collection tools shown to be valid?	1	1	1	1	1	1	1	1
Q2. Were data collection tools shown to be reliable?	1	1	1	1	1	1	1	1

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Total Score	1	1	1	1	1	1	1	1
Withdrawals and drop-out								
Q1. Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	1	1	2	2	1	1	1	1
Q2. Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	1	1	4	4	2	2	3	1
Total Score	1	1	3	3	2	2	3	1
Intervention Integrity								
Q1. What percentage of participants received the allocated intervention or exposure of interest?	1	1	1	1	1	2	3	1
Q2. Was the consistency of the intervention measured?	1	2	2	2	2	2	2	1
Q3. Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	6	6	6	6	6	6	6	6
Analyses								
Q1. Indicate the unit of allocation (circle one)	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual
Q2. Indicate the unit of analysis (circle one)	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual

Appendix E

Q3. Are the statistical methods appropriate for the study design?	1	1	1	1	1	1	1	1
Q4. Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	2	2	2	2	2	2	2	2
Global Rating	3	3	3	3	3	3	3	3

Note. Please refer to the assessment tool in Appendix B for the corresponding explanations for each rating

Appendix F CLARIFY guidelines checklist (Ward et al., 2022) – scores for each study

Study	Item 1	Item 2	Item 3a	Item 3b	Item 4	Item 5	Item 6a	Item 6b	Item 6c	Item 6d	Item 7a	Item 7b	Item 7c	Item 8a	Item 8b	Item 8c	Item 9a	Item 9b	Item 10a	Item 10b	Item 10c
Becket al	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Yes	No	Yes	Yes	n/a
Brandao et al	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Yes	Yes	No	Yes	n/a
Cox et al	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	n/a	No	No	No	n/a	n/a
Erkin & Aykar	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	n/a	n/a	n/a	n/a	No	No	No	n/a	n/a
Gard et al	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	n/a	n/a	n/a	n/a	n/a	n/a	No	No	No	n/a	n/a
Karmer & Cuccolo	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Yes	No	No	n/a	n/a
Kearns	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Yes	No	No	Yes	Yes
Uebelacker et al	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	n/a	n/a	n/a	n/a	No	Yes	Yes	Yes	Yes

Appendix G ERGO Ethics Approval

Approved by Faculty Ethics Committee - ERGO II 94614



ERGO II – Ethics and Research Governance Online <https://www.ergo2.soton.ac.uk>

Submission ID: 94614

Submission Title: An exploration into participant experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample

Submitter Name: Daria Stephani

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

-
- Just a quick note - please make sure the date in the header of your consent form is updated before you begin your study, as it currently says May 2023. Other than that, I'm happy to approve, good luck with your study!

[Click here to view the submission](#)

T/d:

23011_Email_to_submitter__Approval_from_Faculty_Ethics_committee_cat_B__C_
Id: 872046 D.Gorcowska@soton.ac.uk coordinator

Appendix H Participant Information Sheet and Consent Statements

Participant Information Sheet

Study Title: An exploration into participant experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample

Researcher: Daria Stephani

ERGO number: 94614

Version and date: V4 (16/10/2024)

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

The researcher is a trainee on the Doctorate in Clinical Psychology course at the University of Southampton, and this research project is part of a Doctoral Thesis.

This research study is looking to explore how a Hatha yoga intervention is experienced by people who have undergone bariatric surgery.

The reason behind this research study is the felt need for alternative forms of therapy for people who have undergone bariatric surgery. It is known that people who struggle with obesity tend to experience social stigma which has a negative impact on mental health that can persist despite weight loss following bariatric surgery.

Yoga is a holistic approach to treatment which means that it emphasises the connection between the body, mind and spirit. Hatha yoga means that the practice incorporates meditation, breathing exercises and physical movements alongside yoga philosophy. Existing research has found yoga to be beneficial for symptoms of anxiety and depression. It has also been found to develop greater self-compassion.

We are interested in understanding how Hatha yoga is experienced by people who have previously undergone bariatric surgery. Our longer-term aim is to inspire follow-up research in this area to understand whether Hatha yoga would be an effective alternative to traditional talking therapies for those who have undergone bariatric surgery.

Yoga myth busting:

Yoga can often be misrepresented in the Western world and on social media. We tend to be presented with images of young, slim women, twisting their bodies into challenging positions, which can often discourage people from trying yoga.

Despite what you may have heard, yoga is not a form of physical exercise rather, it is a philosophy and a way of life. It focuses on the connection between the body, the mind and the spirit, aiming to improve overall wellbeing. You can be of any gender, age, you can have any body type and you do not need to be able to touch your toes to engage in yoga practice and to be able to experience its benefits.

Why have I been asked to participate?

We are looking for 30 participants to take part in our Hatha yoga intervention as we are keen to understand how it is experienced by those who have previously undergone bariatric surgery and whether it would be a beneficial alternative therapy option.

You have been asked to take part in this research as you are 18+ and you have undergone bariatric surgery a minimum of 2 years ago.

We are specifically recruiting those who had surgery at least 2 years ago because this is a point at which NHS support tends to stop. We are interested in understanding whether further support at this stage would be beneficial.

What will happen to me if I take part?

Firstly, you will be asked to sign a consent form to indicate that you give your consent to take part in the study. This will include self-certifying that you are medically fit to take part in the intervention. If you have any physical health conditions, we encourage you to speak to a relevant healthcare professional prior to taking part in the study.

You will then be presented with eligibility questions and you will be asked to provide brief information about yourself. We collect this information in order to be able to describe the type of population which took part in the study.

We will also ask you to provide your contact details so that we can get in touch with you to set up the intervention (dates, times etc.).

The first part of the study involves completing 4 online questionnaires. As part of this, the system will present you with a 4-digit number sequence which will be your pseudo-ID. Please take a note of this as you will need to quote it should you wish to withdraw from the study so that your data can be identified and destroyed.

The yoga intervention will take place online via Microsoft Teams (you will be emailed the link to the sessions ahead of time). You will be offered 4, weekly sessions which will last 1 hour and they will be led by a qualified yoga teacher. We would like to ask that you attend from a quiet and comfortable space, and please ensure that you have a reliable internet connection. You are welcome to keep your cameras switched off if this would feel more comfortable for you. You can use your pseudo-ID as your name on Microsoft Teams to help maintain your confidentiality.

Please note that the yoga teacher will be using a separate device to record herself during the sessions. Only the yoga teacher will be visible on the recording. The purpose of this is so that the sessions can be evaluated against a questionnaire which measures the amount of essential properties of yoga that were used in the sessions. This is important for the purposes of writing the research report so that it can support follow up research and potential clinical applications.

The yoga intervention will involve meditation and breath work alongside some gentle physical movements that will be pitched at a beginner's level therefore, no prior experience of yoga is required.

We would like to ask that you attend all sessions in order to get the full experience, and the full potential benefit, of the intervention.

Once the intervention comes to an end, you will be asked to complete 4 online questionnaires and a feedback form relating to the intervention.

If you agree, you will then be contacted by the researcher to set up a date and time to complete an online interview to discuss your experiences of the intervention. The online interview will take place via Microsoft Teams and it will last up to 1 hour. You are welcome to keep your camera switched off if this would make you feel more comfortable. The interview will be recorded to enable the researcher to transcribe the content of the interview. The transcript will be anonymised to protect your confidentiality. Once the interview has been transcribed, the video recording will be deleted.

You will receive a £25 Amazon voucher for your participation in the study.

Please note that places for the intervention are limited and are capped at 30. Places will be confirmed on a first come, first served basis. Places for the interviews are also limited and will be confirmed on a first come, first served basis.

Are there any benefits in my taking part?

We would expect that you would notice an improvement in your general wellbeing as a result of participating in the yoga intervention however, we cannot say this for certain.

Your participation in this research will help to generate new knowledge regarding the use of Hatha yoga as an intervention for people who had undergone bariatric surgery in the past, and this can subsequently inspire follow-up research.

You will receive a £25 Amazon voucher for taking part in the intervention.

Are there any risks involved?

Although the intervention will be pitched at beginners' level, you may experience some physical discomfort during and after the intervention. This may apply particularly to those who are new to yoga.

The intervention is likely to make you more aware of your body which could potentially be psychologically distressing especially if you have been consciously avoiding awareness of your body.

We ask that you look after yourself throughout the intervention and that you take the necessary steps to maintain your wellbeing. You can stop at any time if you experience any discomfort or if you need to take medication.

The interview could potentially uncover difficult themes which could lead to some psychological discomfort. You will be offered a debrief session with the researcher following the completion of the study, and you will be provided with contact details for emotional support services, should you require further support.

Should taking part in this study cause you any discomfort or distress, you can contact the following organisations for support:

Your GP

NHS Talking Therapies <https://www.nhs.uk/service-search/mental-health/find-an-NHS-talking-therapies-service/>

Mind <https://www.mind.org.uk/>

Samaritans – Tel. No 116 123

What data will be collected?

We will collect your demographic data: your age, your gender, your ethnicity, the length of time since your bariatric surgery and any previous experience of yoga. This information will be used to describe who took part in our study. It will also enable us to uncover any trends.

We will also collect your contact details which will be shared with the research team. Your contact details will be uploaded onto a password protected document and each member of the research team will be using a password protected laptop. Your contact details will be deleted once the project has been completed and the voucher has been paid.

Your questionnaire responses will be collected and stored online using Qualtrics, which is a cloud-based platform that helps to collect, measure and analyse data. Once your response has been submitted, your email address will be removed and stored

separately which means that we will no longer know who the data belongs to therefore, should you wish to withdraw from the study, you will need to provide your pseudo-ID as this will enable us to locate your data to destroy it. We therefore ask that you take a note of your pseudo-ID when it is generated for you.

The yoga teacher will be recording herself during the sessions on a separate device. Only the yoga teacher will be visible on the recording. As discussed above, this is for the purposes of evaluation. The video recordings will be stored securely on the yoga teacher's password protected device and they will be made available to the research team. Once the research report has been produced, the recordings will be deleted.

The interview will take place online via Microsoft Teams and it will be recorded. The recording will be stored securely on the researcher's Microsoft Teams account until an anonymised transcript (all identifiable information will be deleted) is produced. Once the transcript has been finalised, the recording will be deleted. The anonymised transcript will be stored on a password protected document and it will be destroyed once the research report has been produced.

The questionnaire and interview data will be shared with the research team and it will be stored securely on a password protected document file.

Once the report has been published, the anonymised data will be deposited at Southampton Repository where it will be stored securely for a minimum of 10 years, as per university guidance.

Will my participation be confidential?

Your participation and the information we collect about you during the course of the research will be kept strictly confidential. Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Please note that anonymised quotes from the interviews will be used in the report and publication.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw from the study at any point without giving a reason and without your participant rights being affected. Please be aware that it may not be possible to remove your data once your personal information is no longer linked to the study data. You can ask for your data to be destroyed within 2 weeks of your participation in the study. This is because once the data has been analysed, it will become anonymous and thus we would not be able to identify it in order to destroy it.

If you would like to withdraw from the study and would like your data destroyed, please email the researcher on: dg3n22@soton.ac.uk quoting your pseudo-ID.

What will happen to the results of the research?

Your personal details will remain strictly confidential. As mentioned above, anonymised quotes from the interviews will be used in the report and publication. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

The anonymised data will be available to be shared with other researchers, upon request. This can be beneficial for the development of further knowledge within this research area.

Once the report has been published, the anonymised data will be deposited at Southampton Repository where it will be stored securely for a minimum of 10 years, as per university guidance.

Where can I get more information?

Should you require more information, please contact the researcher on:

dg3n22@soton.ac.uk.

You can also get in touch with the research team on: l.a.cant@soton.ac.uk or

a.bennetts@soton.ac.uk.

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researcher who will do their best to answer your questions.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Head of Research Ethics and Clinical Governance (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at [this link](#)

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you.

Thank you for taking the time to read the information sheet and considering taking part in our research.

CONSENT FORM

Study Title: An exploration into participant experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample

Ethics/ERGO number: 94614

IRAS number: N/A

Version and date: V4 (26/09/2024)

Thank you for your interest in this study. Prior to taking part, we ask that you read the below Consent Form. Please take some time to carefully consider the information below and tick (check) the consent box next to each statement only if you agree to participate in this research and understand what this will mean for you.

Please tick (check) the consent boxes below if you agree with the statements:

- ☐ I confirm that I have read the Participant Information Sheet version 2 dated 02/08/2024 explaining the study above and I understand what is expected of me.
- ☐ I was given the opportunity to consider the information and ask questions about the study.
- ☐ I agree to take part in this study and understand that data collected during this research project will be used for the purpose of this study.
- ☐ I understand that my participation is voluntary and that I am free to withdraw from this study at any time without giving a reason.
- ☐ I confirm that I have discussed any physical health conditions with a relevant healthcare professional and I confirm that I am medically fit to take part in the study.
- ☐ I understand that the interviews will be recorded via Microsoft Teams. I understand that I am allowed to have my camera switched off. I understand that the interview is being recorded for the purposes of creating a transcript. I understand that once the transcript has been produced, it will be anonymised and the recording will be deleted.

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- ☐ I understand that the yoga teacher will be recording herself during the sessions on a separate device and that only the yoga teacher will be visible on the recording. I understand that this is for purposes of evaluation and subsequent reporting of the study.
- ☐ I understand that if I withdraw from the study, it may not be possible to remove my data once my personal information is no longer linked to the study data. I understand that I can withdraw my data from the use in this study within 2 weeks following my participation. I understand that my anonymised data collected during this study will be archived in a data repository so that it can be used for future research and learning.
- ☐ I understand that all personal information collected about me (e.g., my name and contact details) will be kept confidential (i.e., will not be shared beyond the study team) and it will be deleted once the study has been completed and my voucher has been paid.

Appendix I Recruitment Poster



ERGO Number: 94614.A3
Version: 4
Date: 15/11/2024



**HAVE YOU HAD BARIATRIC SURGERY
OVER 2 YEARS AGO AND ARE OVER 18?**

PARTICIPANTS NEEDED!

**WE WOULD LIKE TO INVITE YOU TO TAKE
PART IN OUR YOGA INTERVENTION – AND
NO, YOU DON'T HAVE TO BE ABLE TO
TOUCH YOUR TOES TO TAKE PART!**

WHAT'S INVOLVED?

- Completion of 4 online questionnaires before and after the intervention
- 4 online yoga sessions (1hr each, once weekly)
- 1 online interview following the intervention to share your experiences (up to 1hr)



WHAT ARE THE BENEFITS?

Yoga has been found to increase general wellbeing.

There is very little research into yoga for people who had undergone bariatric surgery. You will be contributing new knowledge which could help inspire future interventions for this group of people.

YOU WILL RECEIVE A £25 AMAZON VOUCHER FOR YOUR PARTICIPATION

Please note that this advert will close on 09/01/2025 at 11pm

For more information, or if you would like to take part, please scan the QR code above.

If you would like to get in touch with us directly, please contact Daria Stephani (researcher) on: dg3n22@soton.ac.uk

Appendix J Recruitment Strategy

Places contacted	Agreed to share/ did not respond/ declined
Healthier Weight Community (FB group) – email: enquiry@healthierweight.co.uk	Agreed to post on FB group
Weight Wise - Bariatric Psychological Support (FB group)	Agreed to post on FB
Support Group - Mr Zaher Toumi - Weight Loss Surgeon - zahertoumisurgery@gmail.com	Agreed to post on FB and Instagram
Gastric Bypass & Sleeve Support Group (UK MEMBERS ONLY!) (FB group)	Agreed to post on FB
notice boards – Tesco and Sainsburys	Agreed to advertise
Redit group – briathletes	Agreed to advertise
Redit group – gastric sleeve	Agreed to advertise
Redit group – gastric bypass	Agreed to advertise
London Obesity Group (thelondonobesitygroup.co.uk) - info@thelondonobesitygroup.co.uk	Did not respond
Centre For Bariatric Support - Info@centreforbariatricsupport.com	Did not respond
Bariatric Support Gastric Sleeve/Bypass UK (FB group)	Did not respond
Weight Loss Surgery Group (SE) (FB group)	Did not respond
Obesity UK Bariatric And Metabolic Surgery Support Group (FB group) – email: enquiries@wlsinfo.org.uk	Did not respond
Bariatric Support Group UK (FB group)	Did not respond

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UK bariatric support. food inspiration too	Did not respond
Bariatric recipes UK (FB group)	Did not respond
UK bariatric women's support group (FB group)	Did not respond
bariatric support UK (FB group)	Did not respond
Worcestershire Bariatric Support Group (FB group)	Did not respond
ABL Health Bariatric Support Group (FB group)	Did not respond
Gastric band UK (FB group)	Did not respond
The bariatric group (FB group)	Did not respond
British Obesity & Metabolic Surgery Society	Did not respond
International bariatric club	Did not respond
British Wheel of Yoga	Did not respond
Ramsay Health Care - https://www.ramsayhealth.co.uk/treatments/weight-loss-surgery/your-aftercare	Did not respond
Weight watchers	Did not respond
Pure gym Southampton	Did not respond
The gym group	Did not respond
David Lloyd Southampton	Did not respond
Snap fitness Southampton	Did not respond
Fit4her gym Southampton	Did not respond

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The Bariatric Group Support@personalweightloss.co.uk	Did not respond
Redit group - post bariatric support	Did not respond
Redit group – bariatric recipes	Did not respond
Redit group – bariatric support	Did not respond
Redit group – WLS	Did not respond
Redit group – WLS support	Did not respond
community boards Rushmoor	Declined to advertise
Slimming world	Declined to advertise
Redit group – bariatric surgery	Declined to advertise

Appendix K Eligibility Questions

Eligibility Questions

Please complete the below questions to confirm you are eligible to take part in the study.

Are you aged 18 or over?

☐ Yes

☐ No

Have you undergone bariatric surgery a minimum of 2 years ago?

☐ Yes

☐ No

Are you currently residing in the UK?

☐ Yes

☐ No

Are you medically fit to take part in the yoga intervention?

☐ Yes

☐ No

Appendix L Demographic Questions

Demographic Questions

Your answers will help us describe who took part in the study and they can also help us uncover any trends.

Q12

What is your age?

Q13

What gender do you best identify with?

- ☐ Female
- ☐ Male
- ☐ Non-binary
- ☐ Transgender
- ☐ Prefer not to say
- ☐ Other (please specify)

Which best describes your ethnicity?

- ☐ **Asian or Asian British;** Indian
- ☐ **Asian or Asian British;** Pakistani
- ☐ **Asian or Asian British;** Bangladeshi
- ☐ **Asian or Asian British;** Chinese
- ☐ **Asian or Asian British;** Any other Asian background
- ☐ **Black, Black British, Caribbean or African;** Caribbean
- ☐ **Black, Black British, Caribbean or African;** African
- ☐ **Black, Black British, Caribbean or African;** Any other Black, Black British, or Caribbean background
- ☐ **Mixed or multiple ethnic groups;** White and Black Caribbean
- ☐ **Mixed or multiple ethnic groups;** White and Black African
- ☐ **Mixed or multiple ethnic groups;** White and Asian
- ☐ **Mixed or multiple ethnic groups;** Any other Mixed or multiple ethnic background
- ☐ **White;** English, Welsh, Scottish, Northern Irish or British Irish
- ☐ **White;** Irish
- ☐ **White;** Gypsy or Irish Traveller
- ☐ **White;** Roma
- ☐ **White;** Any other White background
- ☐ **Other ethnic group;** Arab
- ☐ **Other ethnic group;** Any other ethnic group

Q15

When did you undergo bariatric surgery? Please enter this as (MM/YYYY)

Q16

Do you currently practice yoga or have you done so in the past?

- ☐ Yes
- ☐ No

Appendix M Body Compassion Questionnaire (BCQ; Beadle et al., 2021)

To the right of each item, indicate how often you behave or feel in the stated manner, using the following scale ranging from 1 = *Almost never* to 5 = *Almost always*:

		Almost never		Almost always		
		1	2	3	4	5
1	I like my body in spite of small inadequacies	1	2	3	4	5
2	Body image is something that most people have issues with.	1	2	3	4	5
3	I am trying to become more accepting of my body	1	2	3	4	5
4	Everyone has mixed feelings about their body	1	2	3	4	5
5	I do not really think a lot about my body, I accept this is me.	1	2	3	4	5
6	Everyone has something they do not like about their body	1	2	3	4	5
7	I accept the flaws in my body, even if I don't like them	1	2	3	4	5
8	I try my best to accept my body	1	2	3	4	5
9	I have stopped worrying about weight and body shape	1	2	3	4	5
10	I am sure everyone has insecurities about their bodies	1	2	3	4	5
11	I try to be kind to myself about my body	1	2	3	4	5
12	There are people who have the same or even worse thoughts about their body image than I do	1	2	3	4	5
13	I am really grateful for the way my body is	1	2	3	4	5
14	I am working on making myself feel better about the way I look	1	2	3	4	5
15	I do not think anyone is completely satisfied with their body	1	2	3	4	5
16	I am thankful for the way I look	1	2	3	4	5
17	Nearly everyone has some negative feelings about their bodies	1	2	3	4	5
18	I need to be more accepting of my body	1	2	3	4	5
19	I feel ok with my body the way it is	1	2	3	4	5

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20	I try to empathise with myself and say I am ok and that I am happy with my body	1	2	3	4	5
21	I accept my body the way it is and am comfortable in my own skin	1	2	3	4	5
22	The way I feel about my body is probably a normal thing for everyone	1	2	3	4	5
23	I am quite comfortable in my body	1	2	3	4	5

To calculate overall body compassion, a mean score is calculated from all 23 items (overall mean score should be between 1 and 5)

To compute subscales scores, a mean score is calculated from the items in each subscale (mean subscale scores should all be between 1 and 5):

- *Body kindness (BK)* refers to expressing kindness and understanding towards one's body, without criticism or judgement. It includes elements of gratitude, acceptance and comfort in one's own skin.
 - Mean of items 1, 5, 7, 9, 13, 16, 19, 21, 23 (9 items)
- *Common humanity (CH)* refers to the realisation/understanding that one's feelings are not just experienced by you, but by all humans, and that they are common among peers, family and strangers.
 - Mean of items 2, 4, 6, 10, 12, 15, 17, 22 (8 items)
- *Motivated action (MA)* refers to motivation and actual attempts to change one's feelings and accept the positive as well as the negative.
 - Mean of items 3, 8, 11, 14, 18, 20 (6 items)

Appendix N Difficulties in Emotion Regulation Scale – 16 item version (DERS-16; Bjureberg et al., 2016)

Difficulties in Emotion Regulation Scale - 16 item version (DERS-16)

Instructions:

Please indicate how often the following statements apply to you by selecting the appropriate option for each item.

		Almost Never	Sometimes	About half the time	Most of the time	Almost always
1	I have difficulty making sense out of my feelings	1	2	3	4	5
2	I am confused about how I feel	1	2	3	4	5
3	When I am upset, I have difficulty getting work done	1	2	3	4	5
4	When I am upset, I become out of control	1	2	3	4	5
5	When I am upset, I believe that I will remain that way for a long time	1	2	3	4	5
6	When I am upset, I believe that I'll end up feeling very depressed	1	2	3	4	5
7	When I am upset, I have difficulty focusing on other things	1	2	3	4	5
8	When I am upset, I feel out of control	1	2	3	4	5
9	When I am upset, I feel ashamed with myself for feeling that way	1	2	3	4	5
10	When I am upset, I feel like I am weak	1	2	3	4	5
11	When I am upset, I have difficulty controlling my behaviours	1	2	3	4	5
12	When I am upset, I believe that there is nothing I can do to make myself feel better	1	2	3	4	5
13	When I am upset, I become irritated with myself for feeling that way	1	2	3	4	5
14	When I am upset, I start to feel very bad about myself	1	2	3	4	5
15	When I am upset, I have difficulty thinking about anything else	1	2	3	4	5
16	When I am upset, my emotions feel overwhelming	1	2	3	4	5

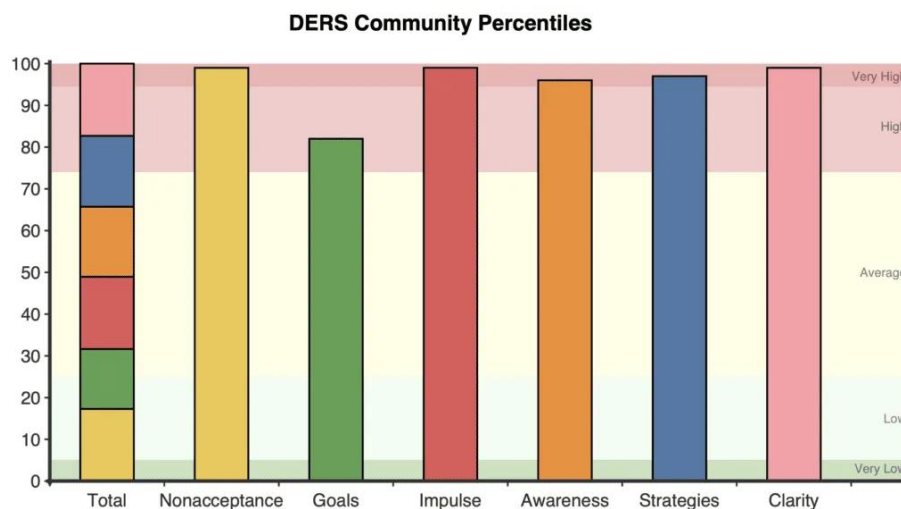
Appendix N

The total score ranges from 16-80 with higher scores indicating more difficulties with emotion regulation. Subscale raw scores have several ranges listed below:

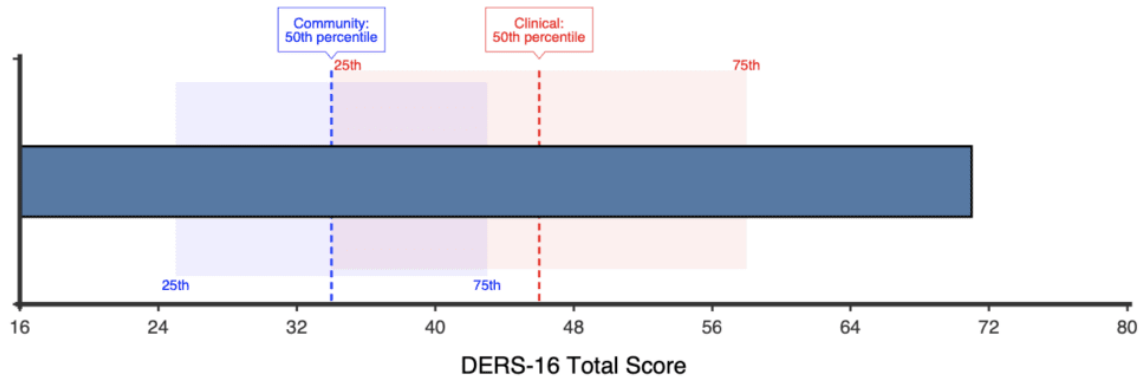
- Non-acceptance (3 items: 9, 10, 13): The Nonacceptance of Emotional Responses subscale assesses negative secondary responses to negative emotions and non-accepting reactions to distress (range 3-15)
- Goals (3 items: 3, 7, 15): The Difficulties Engaging in Goal-Directed Behavior subscale measures difficulties concentrating and accomplishing tasks when experiencing negative emotions (range 3-15)
- Impulse (3 items: 4, 8, 11): The Impulse Control Difficulties subscale reflects difficulties remaining in control of behavior when experiencing negative emotions (range 3-15)
- Strategies (5 items: 5, 6, 12, 14, 16): The Limited Access to Emotional Regulation Strategies subscale assesses the belief that little can be done to regulate emotions effectively when upset (range 5-25)
- Clarity (2 items: 1, 2): The Lack of Emotional Clarity subscale reflects the degree to which individuals know and understand the emotions they experience (range 2-10)

On first administration, a stacked bar graph shows the total and each of the six subscale scores in clinical percentiles. Percentiles give context to a client's score, showing how they compare to their peers. For example, a percentile of 50 represents the typical level of difficulties with emotional regulation among treatment seeking adults.

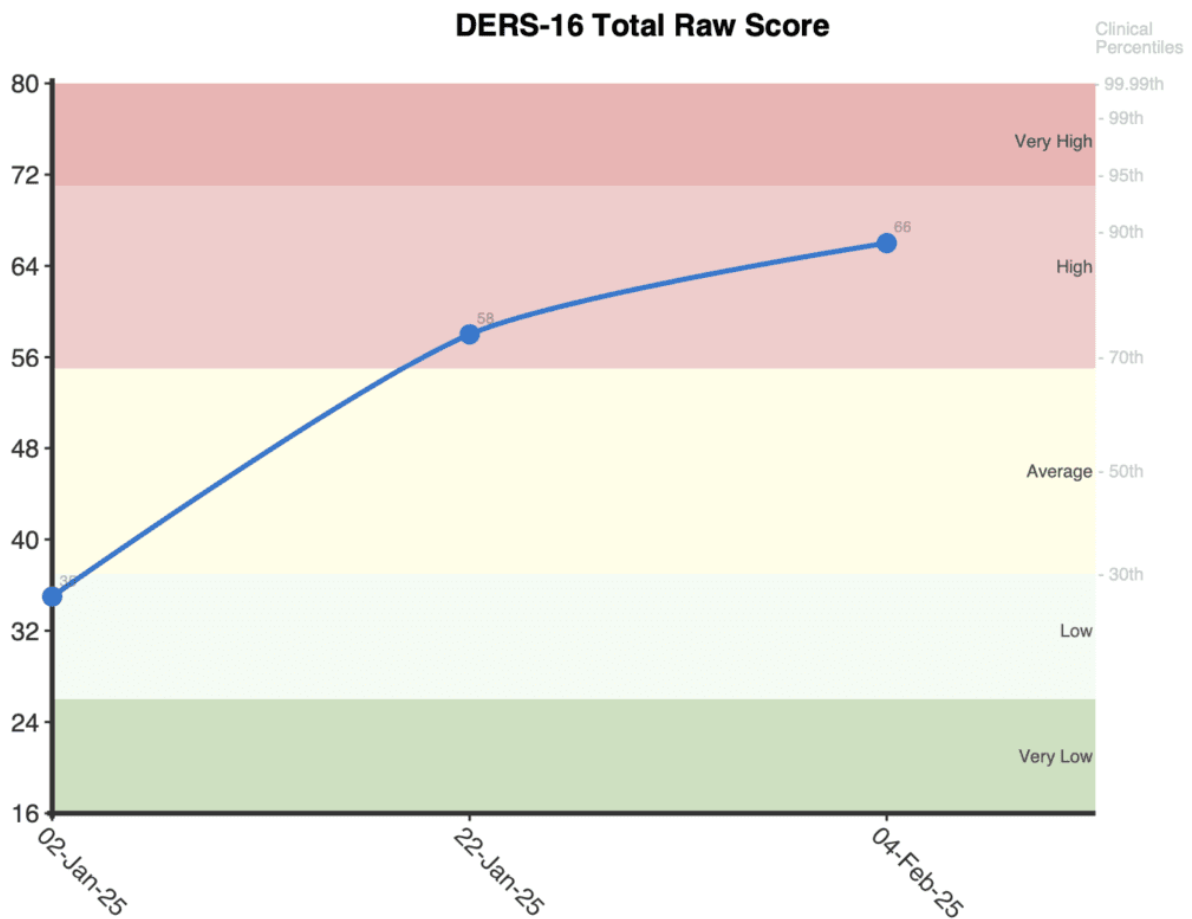
A horizontal comparison graph is also presented showing the respondent's score in comparison to the normative community and clinical samples.



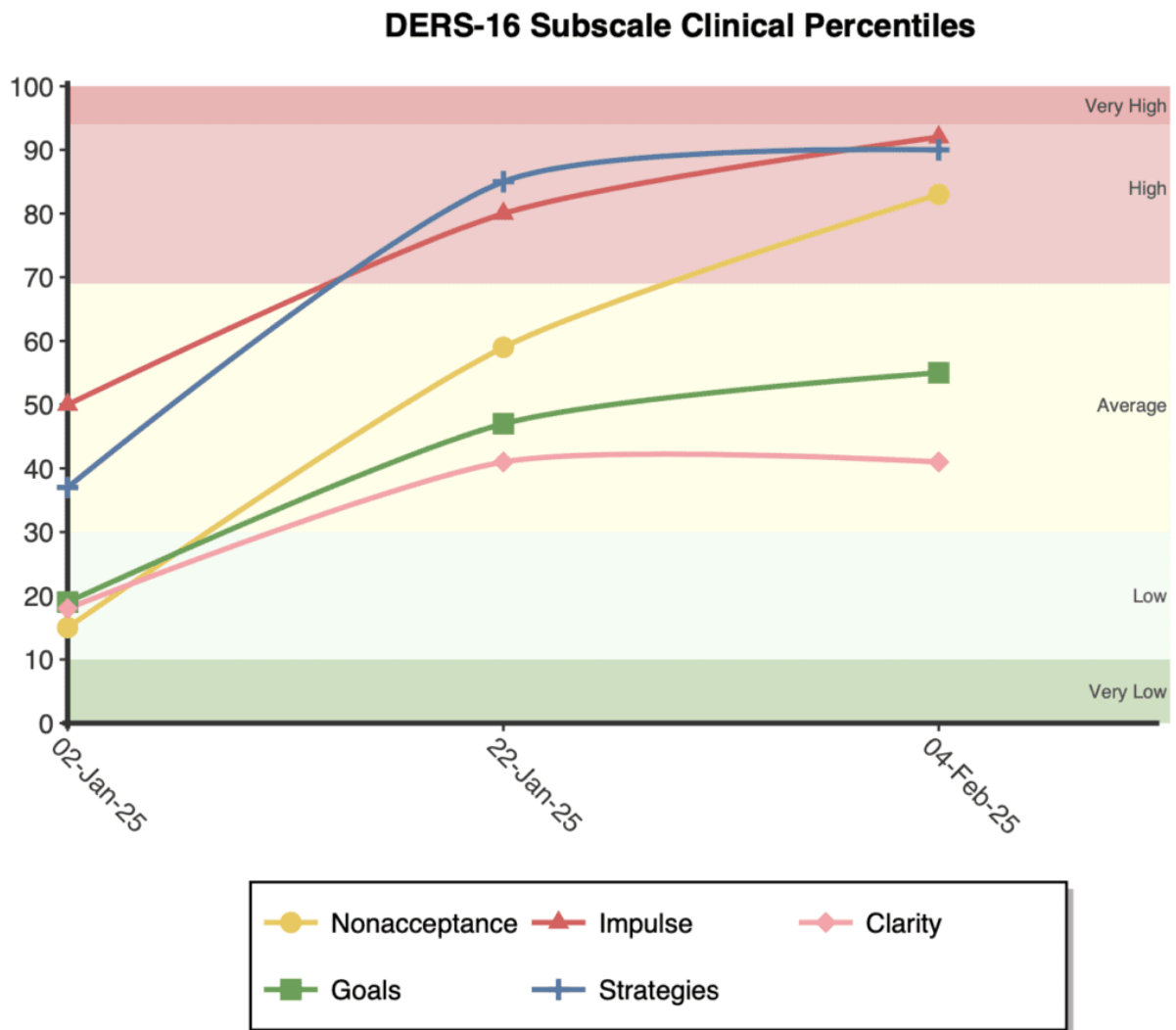
DERS-16 Score Compared to Community and Clinical Populations



When administered more than once, a line graph is presented for the raw total score with clinical percentile labels on the right.



A second line graph is presented plotting each of the five subscales in clinical percentile terms.



Significant improvements or deterioration in the total score are indicated by shifts of half a standard deviation or greater (approximately 7.5 total score points or more) following the guidelines of the Minimally Important Difference (Turner et al., 2010).

Severity categories were created based on clinical percentiles from NovoPsych (2025) and in consideration of community percentiles derived from Bjureberg et al. (2016):

- Percentiles 1st-10th = “Very Low”
- Percentiles 11th-30th = “Low”
- Percentiles 31st-70th = “Average”
- Percentiles 71st-94th = “High”
- Percentiles 95th+ = “Very High”

Appendix O Weight Self-Stigma Questionnaire

(WSSQ; Lillis et al., 2010)

Weight Self-Stigma Questionnaire

If you are obese or overweight and are finding it difficult to manage feelings of shame or guilt about your body, then the Weight Self-Stigma Questionnaire (WSSQ; Lillis, Luoma, Levin, & Hayes, 2010) is presented here for you.

It contains questions designed to evaluate how much you fear the judgments of others, as well as what kinds of things your mind has been saying to you about your weight or body shape. Maybe you notice yourself hesitating to post your picture on your favorite social network, for fear of putting yourself out there. Perhaps holiday dinners with your loved ones elicit feelings of anxiety or panic about how to navigate different food choices. You might be tired of explaining your feelings about being overweight to your uncle or aunt who can't be bothered to listen.

As you know, *A Liberated Mind* walks through all of the psychological flexibility processes that make up ACT. I also included a section on specifically applying these skills to your own efforts related to diet and exercise. Importantly, my colleagues and I can say that there is data to suggest that the WSSQ printed here seems to move in response to an ACT related intervention (Lillis, Hayes, Bunting, & Masuda, 2009). I hope that you see your scores improve as you incorporate more and more psychological flexibility about your weight and body into your life.

Appendix O

Question	Completely Disagree Completely Agree				
I'll always go back to being overweight.	1	2	3	4	5
I caused my weight problems.	1	2	3	4	5
I feel guilty because of my weight problems.	1	2	3	4	5
I became overweight because I am a weak person.	1	2	3	4	5
I would never have any problems with weight if I was stronger.	1	2	3	4	5
I don't have enough self-control to maintain a healthy weight.	1	2	3	4	5
I feel insecure about others' opinions of me.	1	2	3	4	5
People discriminate against me because I've had weight problems.	1	2	3	4	5
It's difficult for people who haven't had weight problems to relate to me.	1	2	3	4	5
Others will think I lack self-control because of my weight problems.	1	2	3	4	5
People think that I am to blame for my weight problems.	1	2	3	4	5
Others are ashamed to be around me because of my weight.	1	2	3	4	5

To find your score, simply sum all of your responses. None of your responses need to be reverse scored. Higher scores mean that you experience more shame related to your weight or body shape, while lower scores indicate that you experience less.

Appendix P Intuitive Eating Scale-2 (IES-2; Tylka & Kroon Van Diest, 2013)

Intuitive Eating Scale-2 (23 items)

Permission to use this measure is not required. However, I do request that you notify me via email if you use the Intuitive Eating Scale in your research.

Directions for participants: For each item, please circle the answer that best characterizes your attitudes or behaviors. (note to experimenter: use “check” in lieu of “circle” if survey is online)

1. **I try to avoid certain foods high in fat, carbohydrates, or calories.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. **I have forbidden foods that I don't allow myself to eat.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. **I get mad at myself for eating something unhealthy.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. **If I am craving a certain food, I allow myself to have it.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. **I allow myself to eat what food I desire at the moment.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. **I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. **I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. **I find myself eating when I am lonely, even when I'm not physically hungry.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. **I use food to help me soothe my negative emotions.**

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10. I find myself eating when I am stressed out, even when I'm not physically hungry.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12. When I am bored, I do NOT eat just for something to do.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

13. When I am lonely, I do NOT turn to food for comfort.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

14. I find other ways to cope with stress and anxiety than by eating.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

15. I trust my body to tell me when to eat.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

16. I trust my body to tell me what to eat.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

17. I trust my body to tell me how much to eat.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

18. I rely on my hunger signals to tell me when to eat.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

19. I rely on my fullness (satiety) signals to tell me when to stop eating.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

20. I trust my body to tell me when to stop eating.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

21. Most of the time, I desire to eat nutritious foods.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

22. I mostly eat foods that make my body perform efficiently (well).

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

23. I mostly eat foods that give my body energy and stamina.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Scoring Procedure:

1. Reverse score Items 1, 2, 3, 7, 8, 9, and 10
2. *Total IES-2 Scale Score:* Add together all items and divide by 23 to create an average score.
3. *Unconditional Permission to Eat subscale:* Add together Items 1, 2, 3, 4, 5, and 6; divide by 6 to create an average score.
4. *Eating for Physical Rather than Emotional Reasons subscale:* Add together Items 7, 8, 9, 10, 11, 12, 13, and 14; divide by 8 to create an average score.
5. *Reliance on Hunger and Satiety Cues subscale:* Add together Items 15, 16, 17, 18, 19, and 20; divide by 6 to create an average score.
6. *Body-Food Choice Congruence subscale:* Add together Items 21, 22, and 23; divide by 3 to create an average score.

Appendix Q Essential Properties of Yoga

Questionnaire (EPYQ) (Park et al., 2018) –

Section 1 (session-by-session scores)

EPYQ Scale	Session 2	Session 3	Session 4	Total
Acceptance/ compassion	4.6	4.8	4.8	4.73
Q1. Setting intentions or goals for the class	3	4	4	3.66
Q2. Acceptance of your body while doing yoga	5	5	5	5
Q3. General thoughts of gratitude, love, kindness, etc.	5	5	5	5
Q4. Self-compassion (kindness/warmth toward yourself)	5	5	5	5
Q5. Acceptance of things as they are	5	5	5	5
Breathwork	4.8	5	5	4.93
Q6. Placing one's focus on the breath	5	5	5	5
Q7. Deep breathing (full inhalation and exhalation)	4	5	5	4.66
Q8. Linking breathing with movement	5	5	5	5
Q9. Instruction of a breathing technique (pranayama)	5	5	5	5

Appendix Q

Q10. Instruction about why breathing is important	5	5	5	5
Physicality	2.25	2.25	2.75	2.42
Q11. Physical balance	4	4	5	4.33
Q12. Physical flexibility	2	2	2	2
Q13. Physical strength	3	3	4	3.33
Q14. Vigorous activity or physical exertion	1	1	2	1.33
Q15. Being in constant motion (vinyasa or flow)	2	2	2	2
Q16. Challenging one's physical balance ("finding one's edge" in regard to physical balance)	2	2	2	2
Q17. Challenging one's physical flexibility ("finding one's edge" in regard to physical flexibility)	2	2	2	2
Q18. Challenging one's physical strength ("finding one's edge" in regard to physical strength)	2	2	3	2.33
Postures, active	2.75	4.25	3.25	3.52
Q19. Alignment, form, and/or correct posture	5	5	5	5
Q20. Modifications to increase the difficulty of a pose	1	2	2	1.66
Q21. Holding poses (longer than a few seconds)	3	2	4	3
Q22. Inverted poses (poses where the head is below the heart or hips)	2	5	2	3
Postures, restorative	3.8	5	3.8	4.2
Q23. Resting between poses	4	5	3	4

Appendix Q

Q24. Modifications to make a pose easier	4	4	4	4
Q25. Recovery-type poses (poses used to rest or recover after more difficult poses)	4	5	4	4.33
Q26. Restorative yoga poses (totally supported/relaxing poses typically held for a longer period)	4	5	4	4.33
Q27. Savasana (corpse pose/the final resting pose)	1	1	4	2
Body locks	2.3	2.66	3.33	2.76
Q28. Engaging muscles at the pelvic floor/region (mula bandha)	2	2	3	2.33
Q29. Engaging muscles at the core/abdominal region (uddiyana bandha)	3	2	4	3
Q30. Engaging jalandhara bandha (drawing chin back and lengthening the back of the neck)	2	4	3	3
Body awareness	5	5	5	5
Q31. Body awareness/paying attention to one's body	5	5	5	5
Q32. Asking students to concentrate on postural alignment	5	5	5	5
Q33. Asking students to concentrate on bodily sensations (e.g., lightness, softness, and muscle awareness)	5	5	5	5
Mental & emotional awareness/release	4.4	4.8	4.6	4.6

Appendix Q

Q34. Allowing or being present to emotions or feelings that come up while doing yoga	5	5	5	5
Q35. Physical relaxation (“letting go” of physical tensions)	5	5	5	5
Q36. Mental relaxation (“letting go” of mental tensions, worries, or mental stress)	5	5	5	5
Q37. Emotional release (“letting go” of emotions)	5	5	5	5
Q38. Visualization or guided imagery	2	4	3	3
Health Benefits	3.25	3.75	4.25	3.75
Q39. Physical health benefits of yoga	3	3	5	3.66
Q40. Emotional health benefits of yoga	4	5	5	4.66
Q41. Mental health benefits of yoga	5	5	5	5
Q42. Spiritual benefits of yoga	1	2	2	1.66
Individual Attention	n/a	n/a	n/a	n/a
Q43. Giving individual attention or feedback (instructor or assistants)				
Q44. Physically assisting students with poses (aligning, pressing, or stretching a student in a pose)				
Q45. Physical support/adjustment of students during savasana (e.g., light facial massage, pressing shoulders, or pulling feet)				

Appendix Q

Social Aspects	n/a	n/a	n/a	n/a
Q46. Partner Yoga (2+ persons connecting/touching in a posture)				
Q47. Time for introductions or greetings				
Q48. Teacher-facilitated social interaction during the session				
Spirituality	2.25	2.25	3.25	2.58
Q49. Chanting and/or reciting mantras or saying “om”	1	2	2	1.66
Q50. Spiritual readings, quotes, sayings, teachings, or ideas	3	3	4	3.33
Q51. Energy (prana, chakras, energy meridians, or nadis)	4	3	5	4
Q52. Reference to a connection to a higher power or something greater than oneself (Spirit, God, Universe)	1	1	2	1.33
Meditation & mindfulness	4.33	5	4.8	4.71
Q53. Quieting the mind	3	5	5	4.33
Q54. Mindfulness (nonjudgmental awareness of one’s thoughts, feelings, or movements)	5	5	5	5
Q55. Meditation during the session	5	5	4	4.66
Q56. Meditation (dhyana: deep absorptive meditation)	4	5	5	4.66
Q57. Withdrawal of the senses (pratyahara: directing the attention from the external toward an internal awareness)	5	5	5	5

Appendix Q

Q58. Concentration (dharana: a state of complete absorption or concentration/focus of the mind)	4	5	5	4.66
Yoga philosophy	4.33	5	4.6	4.64
Q59. Ethical principles (yamas: compassion, truthfulness, nonstealing, moderation, nongreediness)	5	5	5	5
Q60. Personal observances (niyamas: purity/cleanliness, diligence/focused effort, contentment, self-study, attuning oneself to the divine)	4	5	4	4.33
Q61. Union with the divine or “pure awareness” (samadhi)	4	5	5	4.66

Note. 1 = Not at all; 2 = A little bit; 3 = A moderate amount; 4 = Quite a bit; 5 = A very large amount

Appendix R Essential Properties of Yoga

Questionnaire (EPYQ) (Park et al., 2018) –

Section 2

A) General Context and Physical Space

3. Specify the total number of yoga participants in the study.

40 (total number of yoga participants)

3a. Maximum number of persons allowed in an individual yoga session?

N/A (maximum number of persons allowed per session)

3b. Actual number of enrolled participants in an individual yoga session?

Session 1 = 40
Session 2 = 39
Session 3 = 36
Session 4 = 29

 (actual number of persons enrolled per session)

3c. Average attendance across all yoga sessions (average number of participants per session)?

36 (average # of participants per session)

4. Specify the duration of the yoga session in minutes.

60 (minutes)

5. Specify the type/style of yoga utilized in this yoga intervention. Check ALL that apply.

- | | |
|--|--|
| ☐ Ananda Yoga (1) | ☐ Kundalini Yoga (18) |
| ☐ AntiGravity Yoga (2) | ☐ Laughter Yoga (19) |
| ☐ Anusara Yoga (3) | ☐ Moksha Yoga (20) |
| ☐ Ashtanga Yoga (4) | ☐ Power Yoga (21) |
| ☐ Baptiste Yoga (5) | ☐ Partner Yoga (22) |
| ☐ Bikram Yoga (6) | ☐ Restorative Yoga (23) |
| ☐ Chair Yoga (7) | ☐ Sahaja Yoga (24) |
| ☐ Christian Yoga (8) | ☐ Silver Age Yoga (25) |
| ☐ Forrest Yoga (9) | ☐ Sivananda Yoga (26) |
| ☒ Hatha Yoga (10) | ☐ Sudarshan Kriya Yoga (SKY) (27) |
| ☐ Integral Yoga (11) | ☐ Svaroopa Yoga (28) |
| ☐ Integral Science of Hatha and Tantric Arts (ISHTA) (12) | ☐ Tantric Yoga (29) |
| ☐ Iyengar Yoga (13) | ☐ Tibetan Yoga (30) |
| ☐ Jivamukti Yoga (14) | ☐ Viniyoga (31) |
| ☐ Kali Ray TriYoga (15) | ☐ Vinyasa (32) |
| ☐ Kripalu Yoga (16) | ☐ Vivekananda (33) |
| ☐ Krishnamacharya (17) | ☐ White Lotus Yoga (34) |
| | ☐ Yin Yoga (35) |
| | ☐ Yoga Nidra (36) |
| | ☐ Yogic Breathing (37) |
| | ☐ Don't Know (38) |
| | ☐ Other (39) |

5a. If other, please name and describe the type of yoga. _____

6. Was the yoga session adapted for a specific population?

- ☒ Yes (1)
☐ No (2)
☐ Don't Know (3)

6a. If yes, please describe the population and how the yoga was adapted.

.Post-bariatric surgery population – use of chair and modifications to make poses easier

Appendix R

7. Indicate which of the following items were used or occurred during the yoga sessions. Check ALL that apply.

- ☐ Recorded music (1)
- ☐ Live music (2)
- ☒ No music (3)
- ☐ Natural light only (4)
- ☐ Overhead or other electric lighting (5)
- ☐ Candles (6)
- ☐ Yoga mats (7)
- ☐ Yoga straps (8)
- ☐ Blocks (9)
- ☐ Bolsters (10)
- ☒ Chairs (for seated postures) (11)
- ☐ Blankets (12)
- ☐ Incense (13)
- ☐ Aroma Therapy / Essential Oils (14)
- ☐ Eye pillows (15)
- ☐ Sound / singing / crystal bowls (16)
- ☐ Bells / Chimes (17)
- ☐ Noise disturbances (i.e. traffic, sirens, misc. outside noise) (18)
- ☐ Other: (19) _____

7a. If other, please specify: _____

B) Physicality

8. Specify the total number of postures participants moved through during each yoga session. Include every repetition of the same posture in the total count (e.g., if Child's Pose was repeated 3 times, include 3 into the total count).

- ☐ 0-9 (1)
- ☐ 10-19 (2)
- ☐ 20-29 (3)
- ☐ 30-39 (4)
- ☐ 40-49 (5)
- ☒ 50-59 (6)
- ☐ 60-69 (7)
- ☐ 70-79 (8)
- ☐ 80-89 (9)
- ☐ 90-99 (10)
- ☐ More than 100 (11)
- ☐ Not sure/Don't Know (12)

9. Estimate (on average) how long individual postures were held throughout the yoga session (excluding time in Savasana).

20-30 (seconds)

10. On average, how long was Savasana held during the yoga session (in minutes)?

Record the TIME IN MINUTES in the box below. If repeated more than once, input the average number of minutes Savasana was held. Please enter N/A if not applicable.

10 mins - only used in final session (average # of minutes in Savasana per session)

C) Facilitation / Instruction

11. Indicate the method used for facilitation/instruction of the yoga session(s).

- ☐ By an instructor (1)
- ☐ A pre-recorded video (such as a DVD or video phone application) (2)
- ☐ A pre-recorded sound recording (such as a CD, ipod, or MP3) (3)
- ☐ Yoga cards / book / booklet / or pamphlet (4)
- ☒ Live video feed (such as Skype or other remote viewing option) (5)
- ☐ Self-directed (practicing from memory) (6)
- ☐ Other: (7) _____

11a. If other, please specify: _____

12. How often were the poses modeled by an instructor or an assistant?

- ☒ Always (1)
- ☐ Usually (2)
- ☐ Sometimes (3)
- ☐ Never (4)

13. If facilitated by an instructor, indicate how many (not including assistants) were present in each individual yoga session.

- ☒ 1 (1)
- ☐ 2 (2)
- ☐ 3 (3)
- ☐ 4 (4)
- ☐ 5 (5)
- ☐ Other: (6) _____

13a. If other, please specify: _____

13b. How many different yoga instructors taught yoga sessions for the overall intervention/study?

- ☒ 1 (1)
☐ 2 (2)
☐ 3 (3)
☐ 4 (4)
☐ 5 (5)
☐ More than 5, please specify number _____ (6)

14. What is the gender of the primary instructor?

- ☒ Female (1)
☐ Male (2)
☐ Other (3) _____

15. Was the primary instructor a certified yoga instructor?

- ☒ Yes (1)
☐ No (2)
☐ Unsure (3)
☐ Other: (4) _____

15a. If other, please specify: _____

15b. What type of certification(s) does the primary instructor have?

- ☐ RYT200 (1) 500 hours with British Wheel of Yoga, plus, 300 Hours with Sivananda Yoga,
☐ RYT300 (2) plus a 100 hour Essential Breath Course plus DCT training 2 years (Diploma
☐ RYT500 (3) Course Tutor Training)
☐ Other US certification: (4) _____
☐ Other International certification: (5) _____

15c. If other, please specify: _____

15d. How many years of teaching experience does the primary instructor have?

_____ 30 _____ (years teaching)

15e. How many years has the primary instructor been practicing yoga?

_____ 36 _____ (years of practicing yoga)

15f. What type(s) of yoga was the primary instructor trained in? Select all that apply.

- | | |
|---|---|
| ☐ Ananda Yoga (1) | ☐ Kundalini Yoga (18) |
| ☐ AntiGravity Yoga (2) | ☐ Laughter Yoga (19) |
| ☐ Anusara Yoga (3) | ☐ Moksha Yoga (20) |
| ☐ AAshtanga Yoga (4) | ☐ Power Yoga (21) |
| ☐ Baptiste Yoga (5) | ☐ Partner Yoga (22) |
| ☐ Bikram Yoga (6) | ☐ Restorative Yoga (23) |
| ☐ Chair Yoga (7) | ☐ Sahaja Yoga (24) |
| ☐ Christian Yoga (8) | ☐ Silver Age Yoga (25) |
| ☐ Forrest Yoga (9) | ☐ Sivananda Yoga (26) |
| ☒ Hatha Yoga (10) | ☐ Sudarshan Kriya Yoga (SKY) (27) |
| ☐ Integral Yoga (11) | ☐ Svaroopaa Yoga (28) |
| ☐ Integral Science of Hatha and Tantric Arts (ISHTA) (12) | ☐ Tantric Yoga (29) |
| ☐ Iyengar Yoga (13) | ☐ Tibetan Yoga (30) |
| ☐ Jivamukti Yoga (14) | ☐ Viniyoga (31) |
| ☐ Kali Ray TriYoga (15) | ☐ Vinyasa (32) |
| ☐ Kripalu Yoga (16) | ☐ Vivekananda (33) |
| ☐ Krishnamacharya (17) | ☐ White Lotus Yoga (34) |
| | ☐ Yin Yoga (35) |
| | ☐ Yoga Nidra (36) |
| | ☐ Yogic Breathing (37) |
| | ☐ Don't Know (38) |
| | ☐ Other (39) _____ |

15g. If other, please specify: _____

15h. Is the primary instructor a yoga therapist or a yoga teacher?

- ☐ Yoga Therapist (1)
- ☒ Yoga Teacher (2)
- ☐ Unsure (3)

16. Indicate the number of assistants, if any:

- ☐ 1 (1)
- ☐ 2 (2)
- ☐ 3 (3)
- ☐ 4 (4)
- ☐ 5 (5)
- ☐ 6 (6)
- ☐ 7 (7)
- ☐ 8 (8)
- ☐ 9 (9)
- ☐ 10 (10)

D: Overall Intervention

17. Please describe the overall research study design. within-subjects, pre post design

18. How frequently did the yoga sessions meet during the intervention?

_____ per day
1x per week
 _____ per month

19. Total number of yoga sessions in the intervention?

4 (total number of yoga sessions)

body awareness (M = 5), breathwork (M = 4.93), acceptance/ compassion (M = 4.73), meditation & mindfulness (M = 4.71), yoga philosophy (M = 4.64), and mental & emotional awareness/ release (M = 4.6).

20. What were the main components of the yoga intervention?

21. If the intervention followed a unique frequency pattern, please describe it in detail below (e.g., Mondays and Thursdays of each week at 7pm). Thursdays at 6-7pm

22. Did the yoga session follow a prescribed set of sequences and/or yoga postures?

- ☒ Yes (1)
☐ No (2)

22a. If yes, please describe the format.

23. Was a "home practice" specifically recommended, suggested, or prescribed as part of the yoga intervention?

- ☐ Yes (1)
☒ No (2)

23a. If yes to 23, how many minutes of "home practice" were recommended per week?

_____ (minutes/week)

23b. If yes to 23, how many times per week was "home practice" recommended?

- ☐ 1 (1)
☐ 2 (2)
☐ 3 (3)
☐ 4 (4)
☐ 5 (5)
☐ 6 (6)
☐ 7 (7)
☐ Other (8) _____

23c. If other, please specify:

23d. If “home practice” was prescribed, was there support provided (such as a DVD or home practice manual)? Check ALL that apply.

- ☐ No additional support (1)
- ☐ Audio recording (CD, MP3, or other) (2)
- ☐ Online videos or DVD (3)
- ☐ Written materials (manual, pamphlet) (4)
- ☐ Other (5) _____

23e. Are there any other important details about the “home practice” that was prescribed as part of the intervention that is unique to your study? If so, please describe:

24. Is there a check of instructor fidelity to the intervention protocol?

- ☒ Yes (1)
- ☐ No (2)

24a. If yes, please describe. _____

24b. If yes, how frequently? _____

25. How were participants recruited? Check ALL that apply.

- ☐ By individual referral (1)
- ☐ By individual invitation (2)
- ☐ Posted fliers (3)
- ☐ Email distribution lists (4)
- ☒ Social media (Facebook, Twitter, etc.) (5)
- ☐ TV or radio advertising/announcements (6)
- ☐ ResearchMatch or other research participant pool (7)
- ☐ Other (8) _____

25a. If other, specify: _____

26. Did participants receive an incentive for their participation in the study and/or yoga intervention?

- ☒ Yes (1)
☐ No (2)

26a. If yes, describe the compensation(s) given to participants for involvement in the study. Check ALL that apply.

- ☐ a. Cash or check (1)
☒ b. Gift card (2)
☐ c. Token gift (3)
☐ d. Chance to win money or prize (4)
☐ e. Other (5) _____

26b. If other, please describe: _____

27. The yoga groups were... (Check ALL that apply).

- ☐ Open to anyone (1)
☐ Open to members only (2)
☒ Open to a specific population only (3)
☒ Open to consented study participants (4)
☐ Open yoga class where people could begin the intervention at any time (5)
☒ Restricted to the same beginning and end date for all participants (6)
☐ Other (7) _____

27a. If other, specify: _____

Appendix S Email to ineligible participants

Hello ...,

Thank you for getting back to me.

I'm really sorry if the information you were given was unclear, but we are only able to offer the yoga intervention to people who had surgery over 2 years ago.

The reason behind this is because we are interested in finding out whether holistic support would be beneficial to people at a later stage following their surgery. We are interested in this because NHS support tends to be withdrawn after 2 years despite people continuing to struggle with their wellbeing and their mental health.

I'm sorry if this is disappointing.

We really appreciate you showing an interest as well as your willingness to contribute to our research.

Best wishes,

Daria

Daria Stephani (she/her)

Trainee Clinical Psychologist

University of Southampton

Appendix T Yoga Session Plans

Post Bariatric Surgery Course Plan

MODIFICATIONS always option to use a chair and this will be suggested.

Session One	Kindness, Love & Compassion
WHAT IS YOGA?	• Have a chair for sitting, a firm cushion for sitting on the floor (yoga is for all!) • Music of your choice. • Connection (body, mind, heart and breath) • Listen to the body
Intro/tune in	Stillness, feeling into body, short talk, warm up *****<i>(always the same for familiar beginning...long exhale, Spine extension, Spine flexion, Side with extended arms, arm/aura sweep, Easy twist to both sides)</i>
Philosophy/ topic	• Modes of love (from another, to another, from ourselves) • Ahimsa (non-violence. Body & thoughts) • 5 things we are grateful for.
Start Breath	2 part breath. 1 part lower body, 2 part heart and chest. Exhale mouth
Asana	HEART OPENING • Tadasana (simple standing and namaste (palms together) • Chest opening breath with arms add hug • Interlace hands behind back and standing backbend/chest opener. • Single arm side stretch. Kneeling ; • Arms from frame to self-hug with breath. • cat/cow • Anahata asana (heart opening pose) • Lunge and hamstring stretch. • Down Dog • Cobra

	Sitting; • Hands back, knees bent, open chest. Standing; • Warrior one vinyasa with breath to open chest • Shoulder opening sequence SIT IN CHAIR OR FLOOR
Meditation	I am enough
End breath	The nurturing breath
Body Scan	From feet, ending at the heart
Quote	‘There is a place that has never been hurt, never been harmed and that is the truth of who you are’

Session Two	Negative & Positive Mind
Intro/tune in	Stillness, feeling into body, short talk, warm up
Philosophy/ topic	Negative mind huge/Positive mind small. Negativity Bias. 100 people in a room 99 say good things, 1 bad (we remember the bad) Negative train, gathers speed. Just thoughts. Neutral mind The pull of opposites.
Start Breath	Left Nostril Breathing Right Nostril Breathing
Asana	OPPOSITES/AYSEMETRIC • Cat/cow (last session) • Tiger (progression) • Down Dog (bend alternate knees) • Lunge low (with single arm circles) Standing; • Sivananda side stretch. • Chair • Chair with twist to side Kneeling; • Cows face arms • Dandasana (with feet and hand opposite movements) Reclined; • Twist

	• Hip opener
Meditation	Head tapping (head energy clearing)
Breath	Blowing into hands (cloud/ shadow moving breath)
Body Scan	Right side v's Left side
Quote	'Honey bee and the Fly'

Session Three	Present mind, space and Calm
Intro/tune in	Stillness, feeling into body, short talk, warm up
Philosophy/ Topic	Agency when we create space. Space to be present. React or Respond?
Start Breath	Resonance breath with hands fist and outstretched.
Asana	YIN APPROACH (staying longer) Sitting; • Neck exercises. • Lion Breath Standing; • Swaying Palm side stretch • Uttanasana (with chair option) Reclined; • Banana pose • Bridge Sitting; • Side to side sway with spine • Legs wide, stay over leg (hamstring) • Same but down centre
Meditation	So Hum
Breath	In Mouth/ex nose. In nose/ex mouth
Body Scan	Head to feet
Quote	'Between the stimulus and response there is a space....'

Session Four	Energy Body & Endocrine Body
Intro/tune in	Stillness, feeling into body, short talk, warm up
Philosophy/ Topic	The Koshas, Pranamaya Kosha, breath, nadis. The stress system; Endorphins and Serotonin
Start Breath	Belly Breath/ chest breath (faster than session 1) 4 part inhale/4 part exhale

Asana	ACTIVE FLOW Standing; • Body Rub • Infinity Breath Kneeling; • Dynamic Tiger • Flow, cat/ cow, down dog, prayer pose Reclined; • Full body stretch, single knee to chest • Shaking, to feel energy Standing; • Goddess (up and down with cactus arms) • Warrior 1 (up and down with cactus arms) • Sun Breath
Meditation	I am more than just a body
Breath	Alternate Nostril Breath (no hold)
Body Scan	Sensation appreciating

Through meditations, affirmations, philosophy and asana, things like;

- The negative/positive mind.
- Self compassion.
- Body positivity.
- The space behind emotions and thoughts.

Appendix U Feedback Form

Feedback Form

1) How many sessions did you attend?

1

2

3

4

2) How beneficial did you find the intervention to your wellbeing?

0 1 2 3 4 5 6 7 8 9 10

Not at

Extremely

all beneficial

beneficial

3) How beneficial was it for you to have the sessions running online?

0 1 2 3 4 5 6 7 8 9 10

Not at

Extremely

all beneficial

beneficial

Please add any comments you have about the format of the sessions:

4) Would you consider participating in this intervention longer-term?

Yes

No

Not sure

Please explain what influences whether you would participate long-term:

5) Would you recommend the intervention to others?

Yes

No

Not sure

Please explain your reasons for this:

6) Do you think that it would be beneficial to have this intervention as part of an aftercare package for bariatric surgery patients?

Yes

No

Not sure

Please explain why:

7) If this intervention was available in the NHS, would you have considered it before choosing to undergo bariatric surgery?

Yes

No

Not sure

Please explain why:

8) Please provide any further feedback:

Appendix V Feedback Form Results

Q1. How beneficial did you find the intervention to your wellbeing?

Likert score (0 = not at all beneficial - 10 = extremely beneficial)	Frequency	Percent	Valid Percent	Cumulative Percent
2	1	2.6	2.6	35.9
6	2	5.1	5.1	41.0
7	4	10.3	10.3	51.3
8	13	33.3	33.3	84.6
9	6	15.4	15.4	100.0
10	13	33.3	33.3	33.3
Total	39	100.0	100.0	

Q2. How beneficial was it for you to have the sessions running online?

Likert score (0 = not at all beneficial – 10 = extremely beneficial)	Frequency	Percent	Valid Percent	Cumulative Percent
6	1	2.6	2.6	33.3
7	4	10.3	10.3	43.6
8	13	33.3	33.3	76.9
9	9	23.1	23.1	100.0
10	12	30.8	30.8	30.8
Total	39	100.0	100.0	

Q2. Please add any comments you have about the format of the sessions:

Appendix V

Comment	Frequency	Percent	Valid Percent	Cumulative Percent
Convenience	1	2.6	2.6	17.9
Convenience was very good	1	2.6	2.6	20.5
Fantastic	1	2.6	2.6	23.1
Good	1	2.6	2.6	25.6
Having never done any yoga I would have welcomed a bit of an introduction to it especially this type of yoga. This might have been my bad technical skills but I couldn't get the screen to focus just on the teacher so it was a bit hard to follow. I don't know how much the sessions were aimed at bariatric patients or whether they were the same as for anyone else.	1	2.6	2.6	28.2
I enjoyed all the sessions	2	5.1	5.1	33.3
I enjoyed the format, especially the breathing parts as it really made you take time to sit and take in your own thoughts, etc. I also liked the fact that there was "easier" movements using the chair	1	2.6	2.6	35.9
I enjoyed the four sessions	1	2.6	2.6	38.5
I just practically missed the sessions. There should have been reminders in some form, I attended the first session and was thinking the other sessions	1	2.6	2.6	41.0

Appendix V

will be later in February. More communication would have been helpful as we all live busy lives.				
I love the sessions, because it really helped me a lot in every aspect.	1	2.6	2.6	43.6
I really enjoyed that it was done online and I could remotely participate	1	2.6	2.6	46.2
I really love how the interview was conducted.	1	2.6	2.6	48.7
I will love to have such meetings on Zoom next time.	1	2.6	2.6	51.3
It was easy to join and convenient	1	2.6	2.6	53.8
It was really effective and practical demonstrated which really allowed me focus and participate completely.	1	2.6	2.6	56.4
It's a very good format because it helped me as I didn't have to always be in person for the sessions, felt good doing this from the comfort of my home	1	2.6	2.6	59.0
NIL	1	2.6	2.6	61.5
The fact that the yoga facilitator explains what every moves meant and lead by example made it an amazing sessions	1	2.6	2.6	64.1
The format was good. I love the settings and the entire process	1	2.6	2.6	66.7

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The format was great. It was very convenient time also being at home doing in a private home was great	1	2.6	2.6	69.2
The format was very good	1	2.6	2.6	71.8
There were times I kept disconnecting and it kicked me off the session and had to reenter numerous times. also wasn't able to fully see the extent of the posture/position to follow	1	2.6	2.6	74.4
They were very convenient	1	2.6	2.6	76.9
Very convenient	3	7.7	7.7	84.6
Very good	2	5.1	5.1	89.7
Very good and convenient	1	2.6	2.6	92.3
Very good no cost very convenient at my house	1	2.6	2.6	94.9
Very well organised	1	2.6	2.6	97.4
Was very good and convenient	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Q3. Would you consider participating in this intervention longer-term?

	Frequency	Percent	Valid Percent	Cumulative Percent
Not sure	1	2.6	2.6	2.6
Yes	38	97.4	97.4	100.0
Total	39	100.0	100.0	

Q3. Please explain what influences whether you would participate long-term:

Comment	Frequency	Percent	Valid Percent	Cumulative Percent
Because I learnt allot from the previous ones	1	2.6	2.6	7.7
Because I really had a nice time while the sessions and can see some improvement in my body physic	1	2.6	2.6	10.3
Because it keeps my body healthy	1	2.6	2.6	12.8
Continuing to participate in an intervention long-term provides help individuals maintain progress, develop skills, and achieve sustainable change over time.	1	2.6	2.6	15.4
Convenience	1	2.6	2.6	17.9
Convenient	1	2.6	2.6	20.5
For me it would be down to cost and times of classes	1	2.6	2.6	23.1
Help in burning calories	1	2.6	2.6	25.6
I believe help me create more self awareness and consciousness.	1	2.6	2.6	28.2
I enjoyed the practice and health benefits experienced	1	2.6	2.6	30.8
I felt rejuvenated	1	2.6	2.6	33.3
I found it very convenient and helpful	1	2.6	2.6	35.9
I liked the session	1	2.6	2.6	38.5
I love the session it was just too good	1	2.6	2.6	41.0
I need a program to keep me in check to maintain a habit of doing the right thing.	1	2.6	2.6	43.6

Appendix V

I would love to have more sessions like that.	1	2.6	2.6	46.2
I'll like go participate long-term due to the fact that I felt more relaxed and comfortable about my body and the session made me feel better generally.	1	2.6	2.6	48.7
I'd stick with it if I see clear health benefits, it fits into my routine, and it offers reliable, personalized support.	1	2.6	2.6	51.3
If the format remains the same	1	2.6	2.6	53.8
If the session are run under the same format or online one on one	1	2.6	2.6	56.4
It keeps my body more comfortable and healthy	1	2.6	2.6	59.0
It promotes healing and mobility	1	2.6	2.6	61.5
It was generally beneficial and I helped me cope with some factors and issues concerning my emotional wellbeing	1	2.6	2.6	64.1
Same mode of yoga administration	1	2.6	2.6	66.7
Since the mode of delivery is very easy	1	2.6	2.6	69.2
The experience was very nice	1	2.6	2.6	71.8
The long term benefits and more practice	1	2.6	2.6	74.4
The mindfulness and body awareness fostered through yoga could support sustainable lifestyle changes, making it more likely that the weight loss would be maintained over time. T	1	2.6	2.6	76.9
The relaxation and control I was able to develop due to participating in the previous sessions	1	2.6	2.6	79.5

Appendix V

Time it is offered. If it is charged for, how much it would cost.	1	2.6	2.6	82.1
To change my lifestyle	1	2.6	2.6	84.6
To further help in my healing and flexibility	1	2.6	2.6	87.2
To help improve my flexibility and mental strength	1	2.6	2.6	89.7
To help them	1	2.6	2.6	92.3
To make it a lifestyle for my weight and health welfare	1	2.6	2.6	94.9
Very engaging and helpful	1	2.6	2.6	97.4
Yoga is something everyone can do, the movements explained were very simple. Yoga lessons would help to manage everyday stress factors.	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Q4. Would you recommend the intervention to others?

	Frequency	Percent	Valid Percent	Cumulative Percent
No	1	2.6	2.6	2.6
Yes	38	97.4	97.4	100.0
Total	39	100.0	100.0	

Q4. Please explain your reasons for this:

	Frequency	Percent	Valid Percent	Cumulative Percent
As above - stress control	1	2.6	2.6	7.7
Because it increases flexibility	1	2.6	2.6	10.3

Appendix V

Because many out there like myself needs sessions and programmes like this for a healthy living of their soul mind and body.	1	2.6	2.6	12.8
because this program is very important in building confidence and general acceptance of one's body plus it helps individuals to do better than the usual.	1	2.6	2.6	15.4
Come and experience	1	2.6	2.6	17.9
feel good	1	2.6	2.6	20.5
For health reason only	1	2.6	2.6	23.1
For its health benefits, adaptability to different fitness levels, emphasis on the mind-body connection, sense of community support, versatility in styles, and long-term positive effects on physical and mental well-being.	1	2.6	2.6	25.6
For them to have an experience	1	2.6	2.6	28.2
For them to have experience	1	2.6	2.6	30.8
Found it helpful	1	2.6	2.6	33.3
Help them in recovery	1	2.6	2.6	35.9
I did see the benefit to my well being	1	2.6	2.6	38.5
I enjoyed the classes, i certainly think this would be beneficial for anyone as it felt good and I felt refreshed	1	2.6	2.6	41.0
I felt positive throughout each experience. It wasn't difficult to carry out any exercise or procedure. Simple and straightforward.	1	2.6	2.6	43.6
I found it helpful so it would also help them	1	2.6	2.6	46.2
I found it very helpful	1	2.6	2.6	48.7
I found the sessions to be great	1	2.6	2.6	51.3
I found them very helpful	1	2.6	2.6	53.8

Appendix V

I found very helpful even to my physiological wellbeing which would be helpful to them	1	2.6	2.6	56.4
I think bit would help them in their recovery	1	2.6	2.6	59.0
I was happy with the outcome of the previous session on my mental and emotional wellbeing	1	2.6	2.6	61.5
I'd recommend it because it offers clear, tangible benefits	1	2.6	2.6	64.1
Integrating this intervention as part of an aftercare package for bariatric surgery patients could be highly beneficial in supporting their long-term success and overall wellness.	1	2.6	2.6	66.7
It is very helpful	1	2.6	2.6	69.2
It was really enjoyable and relaxing. It was good to have a chance to focus on my body in this way.	1	2.6	2.6	71.8
It went well.... smoothly regardless of weight and others	1	2.6	2.6	74.4
It's really amazing for everyone to have.	1	2.6	2.6	76.9
It's Beneficial	1	2.6	2.6	79.5
Share the experience	1	2.6	2.6	82.1
The experience was really helpful	1	2.6	2.6	84.6
The sessions will impact on having self awareness which will impact individual senses of satisfaction with them self	1	2.6	2.6	87.2
To also experience the healing and mobility	1	2.6	2.6	89.7
To ensure they have a sustainable Lifestyle	1	2.6	2.6	92.3
To have an experience too	1	2.6	2.6	94.9
To help them too	1	2.6	2.6	97.4
Weight maintenance reason	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Q5. Do you think that it would be beneficial to have this intervention as part of an aftercare package for bariatric surgery patients?

	Frequency	Percent	Valid Percent	Cumulative Percent
Not sure	1	2.6	2.6	2.6
Yes	38	97.4	97.4	100.0
Total	39	100.0	100.0	

Q5. Please explain why:

	Frequency	Percent	Valid Percent	Cumulative Percent
As a bariatric patient I feel this would have beneficial to do from straight after the surgery as I feel getting into good practices is the best way to work. It may have helped me to not gain some of the weight back	1	2.6	2.6	10.3
Because it beneficial to everyone that cares about their body size and weight	1	2.6	2.6	12.8
Because it helps to regulate weight	1	2.6	2.6	15.4
because it improves mobility and flexibility also improves stress and anxiety, self awareness and acceptance	1	2.6	2.6	17.9
Because it keeps body more healthy	1	2.6	2.6	20.5
Because it will expose them to a routine best for them to be able to check themselves in check.	1	2.6	2.6	23.1
Because with this, it be helping to maintain the weight of the body.	1	2.6	2.6	25.6
could be a beneficial addition to bariatric aftercare due to its potential to improve physical health (flexibility, strength) and mental well-being (stress reduction, body image). It's a gentle, adaptable exercise that can support long-term healthy habits.	1	2.6	2.6	28.2

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For long-term sustainability	1	2.6	2.6	30.8
Help in body adaptation	1	2.6	2.6	33.3
Help in healing	1	2.6	2.6	35.9
Help in recovery	2	5.1	5.1	41.0
Helps in burning calories after the surgery	1	2.6	2.6	43.6
Helps in recovery	1	2.6	2.6	46.2
I didn't receive a good aftercare package	1	2.6	2.6	48.7
I think it could help with controlling and managing eating disorders	1	2.6	2.6	51.3
I think it's a useful experience all round and doesn't necessarily need to come after a surgery	1	2.6	2.6	53.8
It can help bariatric surgery patients maintain weight loss, improve flexibility and strength, reduce stress, and enhance mindfulness	1	2.6	2.6	56.4
It could help the healing process	1	2.6	2.6	59.0
It could really help patients adjust to lifestyle changes, maintain healthy habits, and manage any challenges that arise after surgery.	1	2.6	2.6	61.5
It is a way to focus in on the body.	1	2.6	2.6	64.1
It will also serve as a good therapy session	1	2.6	2.6	66.7
It would help both in physical recovery and psychological recovery	1	2.6	2.6	69.2
it's great	1	2.6	2.6	71.8
The depression and PTSD associated with the procedure can be outlived with therapy such as yoga.	1	2.6	2.6	74.4
To ensure I get an efficient healing	1	2.6	2.6	76.9
To ensure one has a complete healing both physically and psychologically	1	2.6	2.6	79.5

Appendix V

To have a balanced healing	1	2.6	2.6	82.1
To have a holistic recovery	1	2.6	2.6	84.6
To help in body recovery	1	2.6	2.6	87.2
To help in recovery and body adaptation	1	2.6	2.6	89.7
To help in recovery and stress reduction	1	2.6	2.6	92.3
To help my body reconcile with my mind	1	2.6	2.6	94.9
To help with the body	1	2.6	2.6	97.4
Would be beneficial to learn how to listen and feel the new to body.	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Q6. If this intervention was available in the NHS, would you have considered it before choosing to undergo bariatric surgery?

	Frequency	Percent	Valid Percent	Cumulative Percent
No	3	7.7	7.7	7.7
Not sure	12	30.8	30.8	38.5
Yes	24	61.5	61.5	100.0
Total	39	100.0	100.0	

Q6. Please explain why:

	Frequency	Percent	Valid Percent	Cumulative Percent
it would complement the overall goal of achieving a healthier body and mind after bariatric surgery	1	2.6	2.6	30.8
100%, it would have been even better to get into the routine prior to the surgery to avoid any complications and get into good movement routine	1	2.6	2.6	33.3

Appendix V

As above	1	2.6	2.6	35.9
Because it would have exposed me to what I should have known and how I can discipline myself on the right thing to do.	1	2.6	2.6	38.5
Cost implication	1	2.6	2.6	41.0
Coverage by insurance	1	2.6	2.6	43.6
For long-term sustainability	1	2.6	2.6	46.2
Help in reduce recovery stress	1	2.6	2.6	48.7
I don't know how much specific benefit it would have in terms of the decision making process. But depending on the way it was delivered yoga might help people deal with their weight issues. Although that said, I think by the time people need bariatric surgery it might be too late!	1	2.6	2.6	51.3
I just trust that health provider recommendations will be good until proven otherwise.	1	2.6	2.6	53.8
I prefer exploring non-surgical options first, especially if they provide lasting health benefits and the right support to make sustainable changes.	1	2.6	2.6	56.4
I will	1	2.6	2.6	59.0
I would consider it as it could help me improve my physical and mental well-being, manage stress, and support my weight loss journey in a holistic way.	1	2.6	2.6	61.5
I would have considered it because I went through different options of weight loss before the surgery. None of those options lived up to expectations and I feel like Hatha Yoga might have just been the thing	1	2.6	2.6	64.1
It can help in mind relaxation	1	2.6	2.6	66.7
It really worked for me	1	2.6	2.6	69.2
no	1	2.6	2.6	71.8
Now I would before it was no	1	2.6	2.6	74.4

Appendix V

Recovery	1	2.6	2.6	76.9
Reduce amount of stress after the surgery	1	2.6	2.6	79.5
The cost implication	2	5.1	5.1	84.6
To be able to loose some weights before the surgery	1	2.6	2.6	87.2
To have a complementary healing	1	2.6	2.6	89.7
What it would involve	1	2.6	2.6	92.3
Would be helpful in stress reduction and healing	1	2.6	2.6	94.9
Yes, I would have considered it.	1	2.6	2.6	97.4
yes. the intervention would have made me consider a lot and prepare better	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Q7. Please provide any further feedback:

	Frequency	Percent	Valid Percent	Cumulative Percent
As above, thank you	1	2.6	2.6	71.8
Honestly, I enjoyed all the four sessions and I will still keep it up.	1	2.6	2.6	74.4
I love the sessions	1	2.6	2.6	76.9
I think this intervention is awesome and a great job from the organizers.	1	2.6	2.6	79.5
I will love to participate in the future studies	1	2.6	2.6	82.1
I'm interested in the idea that the NHS might/could offer yoga as I think this would be a long way into the future. That is just based on my experience of using the NHS over many years and not just in the last few years when it really has gone into crisis.	1	2.6	2.6	84.6

Appendix V

It was nice to be part of the intervention	1	2.6	2.6	87.2
N/A	1	2.6	2.6	89.7
no	1	2.6	2.6	92.3
No	1	2.6	2.6	94.9
None	1	2.6	2.6	97.4
The session was really helpful and effective and I'm glad to be part of it.	1	2.6	2.6	100.0
Total	39	100.0	100.0	

Appendix W Interview Topic Guide

Topic Guide

Title: An exploration into participant experiences of a Hatha yoga intervention amongst a post bariatric surgery sample

Keywords: body compassion, emotion regulation and intuitive eating

Questions:

1. What interested you in this research project?

2. How did you find the Hatha yoga intervention, overall?

Prompts: have you practiced yoga previously?

If yes – how long have you been practicing for? In what way was it similar/ different to your previous experience?

If no – did you have any expectations? In what way was the intervention similar / different to your expectations?

3. What was beneficial to you about the intervention?

4. What did you find challenging?

5. How did you experience the mindfulness aspect of the intervention? (provide an explanation of mindfulness)

Prompts: explore whether there were any difficulties with this and what the barriers may have been

6. What did you experience in relation to being aware of your body during the intervention?

Prompts: explore thoughts, feelings and behaviours in relation to body awareness.

Explore whether there was any body avoidance. Was this any different compared to how you would normally relate to your body?

7. What kind of an impact has the intervention had on you?

Prompts: explore whether there have been any changes in how they are relating to their bodies, how they are responding to emotions and whether there have been any changes to their eating behaviours.

8. Would you consider continuing this practice going forwards?

9. Is there anything else that you feel we may have missed, that would be important for us to discuss?

Appendix X Coding Manual Extract

Name	Description	Illustrative quote	Differentiation between codes
Eating regularly	Participants reported that they are now eating more regularly	"I'm eating better and being more mindful of eating regularly and consistently." (Participant 8) "Yeah, like I eat at the normal time I'm supposed to eat. Breakfast, lunch and dinner. Like before, where I find it difficult to, like, eat breakfast, and then when I have lunch, I can't also have dinner again." (Participant 3)	
Comparisons	Participants reported that they struggled with making comparisons prior to the intervention	"I don't like feeling different" (Participant 14) "One of my biggest issues is comparison" (Participant 11)	
Practicing yoga principles in day-to-day life	Participants reported that they practice the principles they learnt in the yoga sessions, in their day-to-day life	"I get to practice those things, she said in class. Not only leave it for the class alone doesn't stay only in the class it extends beyond the classes." (Participant 4)	
Weight gain post-surgery	Participants reported that they gained weight following bariatric surgery	"(...) since working from <u>home</u> the last year and a half, out of the almost five stone that I lost in weight, I've gained back two. Which is obviously a bit frustrating" (Participant 11)	

Name	Description	Illustrative quote	Differentiation between codes
		"I found it difficult to execute some of the poses because I wasn't flexible enough" (Participant 6)	
Eating less convenience food	Participants reported that they noticed a reduction in their cravings for convenience food	"I just noticed my cravings for junks are reduced over time" (Participant 1) "I no longer take those junks that just keep me <u>kinda</u> tight, you know, a lot of sugar resting in my body and all I just want to do is probably sit and lazy around, so rather I just want to stay active" (Participant 4)	
No appetite before yoga intervention	Participants discussed that their appetite was poor post-surgery and prior to engaging in the study	"I remember at some point, like before the whole yoga thing, I don't eat well. Like I don't feed well. I find it very difficult to eat" (Participant 4)	
Eating healthier	Participants reported that they are eating healthier since taking part in the study	"I've been a bit more conscious of trying to be a bit more natural with my foods" (Participant 11) "It just helped me eat healthy basically." (Participant 1)	

Appendix Y Thematic Map

Compassion	Reported benefits	Increased awareness, and encouragement, of yoga practice	Reasons for engagement in the study	Difficulties following surgery	Difficulties in sessions
Demonstration of self-compassion during yoga sessions Acceptance of difficulties associated with beginner status Determination to continue Yoga is not about perfection No difficulties with body awareness Awareness of own abilities Increase in self-acceptance Greater appreciation for body Improved body image More accepting of body Self-acceptance Not concerned with other people's	Physical benefits: Felt re-energised Increased appetite Improved breathing Improved posture Improved strength Improvement in pain Enhanced flexibility Noticed weight loss Improved sleep Greater awareness of feelings Sustained practice helps with mobility Consistency in practice eases physical discomfort Emotional benefits: Feeling relaxed Felt calm	They would recommend the intervention to others More people should be aware of yoga Yoga as part of bariatric surgery care package	Hope for weight loss Expectation of benefit Looking for an opportunity to engage in physical activity	Healthy habits deteriorated after surgery No appetite before yoga intervention Comparisons Weight gain post-surgery Back pain	Wandering of attention during mindfulness Inability to engage in some physical postures at the beginning Technical issues

Appendix Y

opinions about their body	Improvement in stress and anxiety				
Adaptations were welcomed	Improved wellbeing				
Adaptations	Improved emotion regulation				
Adaptations were helpful	Enjoyment				
Chair was a helpful tool	Positive effects increase with practice				
Permission					
Permission to take time out	Psychological benefits				
	Mental clarity				
Permission to be mindful	Feeling more in control of themselves				
Permission to look after oneself					
	Behavioural benefits				
Permission to check in with oneself	Improved hydration				
They enjoyed sitting with themselves	Eating less convenience food				
	Eating healthier				
	Eating regularly				
	No changes in eating habits				
	Interpersonal benefits				
	Consistency is important for improvement				

Appendix Y

	Continued yoga practice They would like to continue with online yoga Breathing helps to manage stressful situations Mindfulness applied to daily situations Practicing yoga principles in day-to-day life Reflection Convenience				
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Appendix Z Debrief Form



Debriefing Form

Study Title: An exploration into participant experiences of a Hatha yoga intervention amongst a post-bariatric surgery sample

Ethics/ERGO number: 94614

Researcher(s): Daria Stephani, Dr Lisa Cant, Dr Alison Bennetts

University email(s): dg3n22@soton.ac.uk, a.bennetts@soton.ac.uk, l.a.cant@soton.ac.uk

Version and date: Version 2, 05/08/2024

Thank you for taking part in our research project. Your contribution is very valuable and greatly appreciated.

Purpose of the study

The aim of this research was to hear about your experiences of the Hatha yoga intervention.

We were also interested in measuring whether there have been any changes in your body compassion levels, emotion regulation and intuitive eating as a result of engaging in the intervention. We measured these concepts using the online questionnaires. We chose not to openly share this with you at the start of the study as we did not want this information to influence your answers.

It is expected that people would report a general sense of wellbeing as a result of engaging in the intervention. We also expect that body compassion and emotion regulation would improve as a result of engaging in the intervention. We were also interested to see whether there would be any changes in intuitive eating.

Your data will help our understanding of how Hatha yoga is experienced by people who had previously

undergone bariatric surgery. Your answers will also help us understand whether any changes need to be made to the intervention, for it to be more beneficial. Your data will also help us understand whether Hatha yoga has an impact on body compassion, emotion regulation and intuitive eating behaviours. In the longer-term, through the use of follow-up research, we hope to produce significant evidence for the benefit of yoga in this population with the aim of introducing it as an alternative treatment option to traditional talking therapies.

Confidentiality

Results of this study will not include your name or any other identifying characteristics. The report will include some quotes from the interviews however, they will be anonymised.

Study results

If you would like to receive a copy of the final report when it is completed, please let us know by using the contact details provided on this form.

Further support

If taking part in this study has caused you discomfort or distress, you can contact the following organisations for support:

- Your GP
- NHS Talking Therapies <https://www.nhs.uk/service-search/mental-health/find-an-NHS-talking-therapies-service/>
- Mind <https://www.mind.org.uk/>
- Samaritans – Tel. No 116 123

Further reading

If you would like to learn more about this area of research, you can refer to the following resources:

Halliwell, E., Dawson, K., & Burkey, S. (2019). A randomized experimental evaluation of a yoga-based body image intervention. *Body Image*, 28, 119-127. <https://doi.org/10.1016/j.bodyim.2018.12.005>

Webb, J. B., Padro, M. P., Thomas, E. V., Davies, A. E., Etzel, L., Rogers, C. B., & Heredia, N. I. (2022). Yoga at Every Size: A Preliminary Evaluation of a Brief Online Size-Inclusive Yoga and Body Gratitude Journaling Intervention to Enhance Positive Embodiment in Higher Weight College Women. *Frontiers in Global Women's Health*, 3, 852854. <https://doi.org/10.3389/fgwh.2022.852854>

Further information

If you have any concerns or questions about this study, please contact Daria Stephani at dg3n22@soton.ac.uk who will do their best to help.

If you remain unhappy or would like to make a formal complaint, please contact the Head of Research Integrity and Governance, University of Southampton, by emailing: rgoinfo@soton.ac.uk, or calling: + 44 2380 595058. Please quote the Ethics/ERGO number which can be found at the top of this form. Please note that if you participated in an anonymous survey, by making a complaint, you might be no longer anonymous.

Thank you again for your participation in this research.