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Exploring the Impact of School-Based Yoga and Mindfulness for Adolescents in a Highly Deprived Urban Area: A Mixed Methods Feasibility Study

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A PhD thesis awarded by the University of Westminster.

Exploring the Impact of School-Based Yoga and Mindfulness for Adolescents in a Highly Deprived Urban Area: A Mixed Methods Feasibility Study

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A thesis submitted in partial fulfilment of the
requirements of the University of Westminster
for the degree of Doctor of Philosophy

October 2021

Abstract

Background: Approximately 13% of children and adolescents in the UK have a mental health problem and these rates are higher rates for adolescents from areas of high deprivation. Schools have a significant role to play in supporting and promoting positive mental health and wellbeing for their pupils. Yoga and mindfulness interventions have grown in popularity and both interventions have been shown to positively impact the psychological, cognitive, interpersonal, and behavioural functioning of adolescents. However, most of the evidence base to date has been conducted in the United States and/or delivered the interventions to a targeted group of adolescents. Therefore, the current thesis aimed to explore the acceptability and effectiveness of universally delivered yoga and mindfulness with a UK-based cohort of vulnerable adolescents from a highly deprived urban area.

Methods: Across two years, 354 12-13-year-old pupils in a single secondary school in central London were randomly assigned by class to participate in ten weeks of yoga, mindfulness, or a control group (PSHE as usual). This research adopted a mixed methods approach. Surveys and cognitive tasks were conducted with adolescents' pre and post intervention ($n = 232$) to measure any changes in wellbeing or cognitive skills. Interviews with a subset of pupils $(n = 45)$ were conducted to explore their views, experiences, and perceived benefits of school-based yoga and mindfulness. Furthermore, interviews with professionals ($n = 16$; intervention facilitators and school staff) were conducted to explore facilitators and barriers to implementation and delivery. Findings from both methodologies were integrated using a triangulation protocol to highlight areas of agreement, disagreement, and silence.

Results: The quantitative findings indicated that there were significant improvements in short-term mood and cognitive skills after participation in yoga and mindfulness. However, there were minimal changes on validated measures of wellbeing, in comparison to the control group. In contrast, the qualitative findings highlighted a range of perceived benefits for adolescents' socioemotional health and concentration. For acceptability, both datasets demonstrated high levels of acceptability for school-based yoga and mindfulness; they were enjoyable, viewed as helpful, and adolescents held positive views about the intervention facilitators. Furthermore, several barriers and facilitators to implementation and delivery were raised by professionals, highlighting an overarching view that ten weeks was insufficient to enable meaningful change. Taken together, the findings emphasise the value of mixed methods research for exploring complex health interventions more comprehensively.

Conclusion: This research demonstrates the feasibility of conducting a three-arm RCT in a school setting in the UK, within a mixed methods paradigm. It has demonstrated the acceptability of universally delivered yoga and mindfulness interventions for a novel population; adolescents from an area of high deprivation in the UK. The interventions have potential to positively impact the wellbeing of vulnerable adolescents. Nevertheless, for interventions to be most effective, schools may need to further embed mind-body interventions into the school day, to increase the frequency and sustain any benefits over a longer-term. Consequently, this research will assist schools in finding practical solutions to promote and support the wellbeing of adolescents, which has become even more imperative in the context of increasing mental health and wellbeing problems exacerbated by the COVID-19 pandemic.

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Sumner, A.L.[1], Ballieux, H., Edginton, T., Khalsa, S.B.S., & Cartwright, T. (2021). The impact of school-based yoga and mindfulness interventions on adolescents' mental health and wellbeing: A qualitative study in a disadvantaged area. *Manuscript submitted for publication.*

Edwards, A.L., Ballieux, H., Edginton, T., Khalsa, S.B.S., & Cartwright, T. (2020, October). The impact of school-based yoga and mindfulness interventions on adolescents' mental health and wellbeing: A qualitative study in a disadvantaged area. Symposium on Yoga Research. *International Journal of Yoga Therapy* (2020) 30 (s1): 1-23. https://doi.org/10.17761/1531-2054-30.s1.1.
   *Awarded the Swami Kuvalyananda Research Abstract Award for Excellence and Innovation in Yoga Research

Edwards, A.L., Ballieux, H., Edginton, T., Khalsa, S.B.S., & Cartwright, T. (2020, August). The impact of school-based yoga and mindfulness interventions on adolescents' mental health and wellbeing: A qualitative study in a disadvantaged area. *European Health Psychology Society: Chartering New Territories in Health Psychology.* Slovakia, Bratislava. [cancelled due to COVID-19]

Edwards, A.L., Ballieux, H., Edginton, T., Khalsa, S.B.S., & Cartwright, T. (2020, June). The impact of school-based yoga and mindfulness interventions on adolescents' mental health and wellbeing: A qualitative study in a disadvantaged area. *Division of Health Psychology Annual Conference.* Bristol, UK. [cancelled due to COVID-19] (Poster presentation)

Edwards, A.L., Ballieux, H., Edginton, T., & Cartwright, T. (2019, May). Yoga and mindfulness in schools: Exploring the impact on young people's wellbeing. *Psychology Research Forum.* University of Westminster, London, UK.

Edwards, A.L. (2019, January). Yoga in Schools: The role of yoga in supporting young people's wellbeing. *Yoga Matters.* https://blog.yogamatters.com/yoga-in-schools/

Edwards, A.L., Ballieux, H., Edginton, T., & Cartwright, T. (2018, May). Mindfulness and Yoga in Schools: Exploring the Impact on Young People's Wellbeing and Executive Functions *Faculty of Science and Technology Doctoral Conference.* University of Westminster, London, UK.
   *Awarded second place award for best speaker.

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[1] Amy Sumner (née Edwards); name changed September 2021.

Acknowledgements

The past four years have been filled with highs and lows throughout this adventure, but I know that I would not have made it through without the support of everyone I have met along the way. First and foremost, I would like to thank my supervisory team for their unwavering enthusiasm, support, guidance, and expertise. This project has certainly had its challenges, but you have always remained realistic, pragmatic, and positive. Even when I wasn't sure of the path forward, you were confident that we would find it. I would like to express my sincere gratitude to my Director of Studies, Dr Tina Cartwright, for your kindness, patience, and confidence boosts when I needed it most. Thank you.

I would like to thank the institutions and organisations who financially supported this PhD. Thanks to the University of Westminster Quintin Hogg PhD Scholarship, City University London for the funds for intervention delivery, and YogaMatters for funding the equipment.

I am grateful to the school that participated in this research. I will be forever thankful to the staff who took a leap of faith and replied to an email about this project. Your interest, enthusiasm, and dedication to making this research work in a challenging setting is inspirational. Thank you to all of the school staff who were integral in making this happen. Thank you also to the pupils who participated in the interventions, surveys, and interviews; it was a privilege to enter your world and learn what you thought of mind-body interventions at school. I hope I have done justice to your experiences.

For the delivery of the interventions, I would also like to extend my thanks to the yoga and mindfulness teachers who were involved in this research. Your passion for yoga and mindfulness came through in spades. Thank you for your commitment and patience within this project, delivering these interventions in ways you may not have done before. I hope you continue to inspire children and adolescents with your passion and knowledge.

To my PhD friends, you are the only ones who can truly understand this adventure! I've thoroughly enjoyed sharing an office (real-life and virtual) with you all over the last four years. Special thanks to Amy and Zoë, who I've looked up to for advice and guidance; and to my Day One's; Pippa, Rosa, and Zac, for starting and ending this journey with me. Extra special thanks to Pippa for always being my biggest cheerleader; I am so glad we've muddled through this together. I have made friends for life and am so grateful to have got through 'The Thing' with you all by my side. Thanks also to my amazing friends who have checked in and offered their support. Credit goes to Gemma for banning the word 'PhD' from our vocabulary!

To Richard, my fiancé and future husband (seven days and counting!), thank you for everything. From the minute I said I wanted to go back to University and do a PhD, you have been supportive, understanding, and interested. Thank you for always making me laugh, even on the worst day. You believed in me, even when I didn't. I truly could not have done this without your support and encouragement.

Finally, I would like to dedicate this thesis to my late parents, Allan and Christine Edwards. You didn't get to see this adventure, but I hope I have made you proud.

Author's Declaration

I declare that all the material contained in this thesis is my own work and has not been submitted to any other University.

Amy Louise Sumner, October 2021

List of Abbreviations

.b	Dot Be
ANOVA	Analysis of Variance
ASRI	Adolescent Self-Regulatory Inventory
ASWS	Adolescent Sleep-Wake Scale
BAME	Black, Asian, and Minority Ethnic
BPS	British Psychological Society
BRS	Brief Resilience Scale
CAMHS	Child and Adolescent Mental Health Services
CAMM	Child and Adolescent Mindfulness Measure
CD-RISC	Connor-Davidson Resilience Scale
COREQ	Consolidated Criteria for Reporting Qualitative Research
DfE	Department for Education
DoH	Department of Health
DoHSC	Department of Health and Social Care
DSST	Digit-Symbol Substitution Test
FOI	Fidelity of Implementation
HPA	Hypothalamic–Pituitary–Adrenal Axis
ID	Identifier
IMD	Index of Multiple Deprivation
MiSP	Mindfulness in Schools Project
NA	Negative Affect
NHS	National Health Service
PA	Positive Affect
PANAS-C	Positive and Negative Affect Scale for Children
PE	Physical Education

PNS	Parasympathetic Nervous System
PSCMM	Prosocial Classroom Mediational Model
PSHE	Personal, Social, Health and Economic Education
PSS	Perceived Stress Scale
RCT	Randomised Control Trial
SCS-C	Self-Compassion Scale for Children
SES	Socio-Economic status
SLCT	Six Letter Cancellation Task
SPSS	Statistical Package for the Social Science
UK	United Kingdom
US	United States
UREC	University Research Ethics Committee
WEMWBS	Warwick-Edinburgh Mental Wellbeing Scale
WHO	World Health Organisation

1. Introduction

1.1 Background

> "Today's young people may not be taking drugs, committing crime, and getting pregnant in the same numbers as yesterday's young people—but they are in another kind of trouble, which is arguably as serious. Britain has an adolescent mental health crisis."
>
> (Stroud & Brien, 2018, p. 19)

Adolescence is a developmental period characterised by physical, psychological, and social changes (Clarke et al., 2021; Farley, 2020). Even under optimal conditions, adolescence is considered a time of 'storm and stress' (Hall, 1904) associated with multiple stressors (Roberts et al., 2009; The Children's Society, 2020). Adolescents may be considered particularly vulnerable due to their developmental stage, which inherently affects their ability to make safe decisions and seek out support (Farley, 2020). Whilst most adolescents will experience some sort of interpersonal, familial, or academic stress, chronic stress during this developmental period is associated with an increased risk of mental health and wellbeing problems (Roberts et al., 2009).

The most recent representative survey of childhood and adolescent mental health and wellbeing issues in the United Kingdom (UK) highlighted that 13% of children and adolescents had a diagnosable mental health problem (Sadler et al., 2018). Currently, this equates to nearly four children in every classroom who are at risk of a range of adverse life outcomes (Colman et al., 2007; Fergusson et al., 2005; Goodman et al., 2011; Khan et al., 2015; Kim-Cohen et al., 2003; Sainsbury Centre for Mental Health, 2009). However, adolescents living in low-income or deprived households are two to three times more likely to be diagnosed with a mental health condition, compared to their more affluent peers (Reiss et al., 2019; Sadler et al., 2018). Therefore, it is vital that children and adolescents are equipped with preventative skills to help manage their emotions. As such, schools are considered well-placed to help support the mental health and wellbeing

of children and adolescents. Children and adolescents spend approximately 8000 hours at school (Cowburn & Blow, 2017), and interventions can be brought directly to pupils to address emotional and behavioural problems before they reach a clinical threshold (Clarke et al., 2021; NHS England and Department of Health [DoH] et al., 2015). Indeed, the prevention paradox principle posits that universal preventative initiatives that involve low-risk individuals may be more effective in reducing disease burden, in comparison to targeting only high-risk individuals (Rose, 1992). Furthermore, there has been increasing interest in universally delivered preventative mental health and wellbeing interventions for adolescents.

In England, health education is generally delivered through the Personal, Social, Health, and Economic (PSHE) education curriculum lesson, which has recently become mandatory in all local authority maintained schools (Department for Education [DfE], 2019). Consistent with the aims of health education, both yoga and mindfulness interventions help improve mental health knowledge, emotional literacy, and strategies for managing mental health and wellbeing. The introduction of this mandatory health education signals how seriously school leaders take in their role in supporting the mental health and wellbeing of pupils (Weare, 2015). Moreover, it highlights the value of supporting the holistic individual at school, as opposed to its focus on educational attainment. As Diamond (2010) stated, academic achievement and social-emotional functioning are fundamentally linked; the most effective way to foster either skill is to value and nurture both aspects of human development.

Therefore, exploring the acceptability and effectiveness of school-based mental health and wellbeing support is timely (Ayre, 2016), particularly within the context of mandatory physical and mental health education within schools. Given these recent policy changes in England, an increasing number of settings may choose to implement mind-body interventions to achieve the aims set out in the PSHE curriculum. Consequently,

this research comes at an opportune time to assist schools in finding practical solutions to support the mental health and wellbeing of their pupils, in line with calls from the government (DoH et al., 2017; NHS England and DoH et al., 2015).

1.2 Outline of Thesis

This thesis aims to explore the impact of school-based yoga and mindfulness interventions in a secondary school in an area of high deprivation in the UK. Following this short introduction, Chapter Two provides an overview of the literature surrounding childhood and adolescent mental health and wellbeing. Health and educational policies have begun to address this crisis, with new guidance for schools as uniquely placed to support mental health and wellbeing. As such, schools are increasingly turning to wellbeing interventions to better support their pupils. Therefore, this chapter provides an overview of the empirical evidence related to two such interventions, yoga and mindfulness. From this, the rationale for the current research is described.

Chapter Three sets out the methodological approach by describing the context of the research setting as a highly deprived urban school and considers the ethical implications of research within this setting. An overview of the two mind-body interventions is provided, including the development process of the Yoga4Schools curriculum and the adoption of the .b (dot-be) mindfulness curriculum. Furthermore, this chapter justifies the mixed methods approach through the two-phase explanatory sequential design adopted throughout this research.

Chapter Four builds upon the methodological approach and provides a detailed overview of the quantitative and qualitative methods utilised. Within the quantitative arm, the sample, measures, and inferential approach to data analysis are described. Within the qualitative methods, consideration is given to the power dynamics within interviews with children and adolescents, before proceeding to describe the samples (children and professionals), procedure, thematic analysis of the data, including key criterion for

increasing the trustworthiness of data. Lastly, the methodological approach to integration is described with the adoption of triangulation protocol to highlight agreement, dissonance, and silence between the quantitative and qualitative data.

Chapter Five briefly describes the importance of fidelity of implementation of interventions such as yoga and mindfulness. It provides the fidelity-related context of the extent to which interventions were implemented as intended, describing the quantitative results collected as a part of these measures. Overall, the Yoga4Schools curriculum was delivered with high fidelity in Year Two, as was the .b curriculum over both years of intervention rollout.

Chapter Six outlines the quantitative findings, comparing pre- to post-intervention changes for the control, yoga, and mindfulness groups. There were minimal statistical differences on wellbeing measures pre-post intervention; however, there were significant differences on cognitive measures and short-term mood measures. Comparisons between the control, yoga, and mindfulness groups were also conducted on acceptability measures to show high levels of enjoyment, rating of the teacher, and perceived benefits of the interventions. These findings are considered within the context of previous research.

Chapter Seven is the first of two chapters presenting the results from the qualitative methods. This chapter sets out the three themes identified when thematically analysing the views and experiences of adolescents who took part in school-based yoga and mindfulness interventions. Adolescents had heterogeneous expectations and assumptions of what yoga and mindfulness interventions would be like. They also highlighted the aspects of mind-body interventions that affected their engagement within intervention sessions, including the positive qualities of the intervention facilitator, agency over their participation, and a preference for interactive sessions. Adolescents also described experiencing key benefits from the interventions, centred around emotional regulation, cultivating positivity and self-confidence, and developing their

focus and concentration skills. After outlining the main findings, these are integrated with the existing evidence base.

Chapter Eight presents qualitative data from professionals (intervention facilitators and school staff) involved in delivering and implementing yoga and mindfulness interventions. Within this data, four key themes were identified. The drivers of implementation describe the dichotomy between adolescents needs and school resources to support mental health. Building trusting relationships sets out the importance of strategies to promote positive teacher-pupil relationships and collaborative teacher-facilitator relationships to deliver intervention sessions effectively. The practical barriers and considerations are addressed, including pupils' behaviour, the inclusivity of the intervention content, and the physical space of the setting. Lastly, the sustainability of the interventions and the potential benefits are discussed, with some concern that ten weeks is insufficient for yoga and mindfulness interventions. These four themes are considered within past research exploring barriers and facilitators to the implementation of school-based interventions.

Chapter Nine combines the quantitative and qualitative findings outlined in Chapters Six to Eight to address the initial research questions. For each research question, a convergence coding matrix sets out the extent to which the quantitative and qualitative data agrees (or disagrees), contributing a mixed methods approach to answering the original research questions. Within this, the advantages of conducting mixed methods research were evident from the agreement, dissonance, and silence within the data. This chapter acts as a summary of the key findings of the thesis.

Chapter Ten provides an overarching discussion of how the key findings from this research contribute to three prominent debates within the school-based mental health and wellbeing field. These debates centre around optimal delivery of school-based interventions, with consideration of who participates in interventions (universal versus

targeted delivery), how long interventions should last (sufficient dosage), and who facilitates the interventions (internal versus external facilitator). Next, the strengths and weaknesses of the current research are presented, providing learning for future research. This is followed by consideration of the practical and research implications, focusing on the impact of COVID-19 on adolescent mental health and wellbeing problems and considerations for future school-based research, before a final conclusion is proffered.

1.3 Personal Reflections

"A researcher's background and position will affect what they choose to investigate, the angle of investigation, the methods judged most adequate for this purpose, the findings considered most appropriate, and the framing and communication of conclusions."

(Malterud, 2001, p. 483-484)

The importance of reflexivity within the qualitative research process is considered in Chapter 4 (Section 4.3.6). Therefore, during the process of undertaking this research, I have continuously considered how my background, knowledge, experience, and biases have shaped this research from inception to dissemination. This section will provide a summary of notes logged in my reflective journal over the course of this research project, summarising key points of reflection, considerations, and challenges.

For me, it is evident how my previous experience led to and influenced decision-making processes in the planning of this project. After completing a BSc in Psychology and MSc in Forensic Psychology, I began working for a charity that supported gang-affected adolescents in London. In seeing the vital work that was being done and how passionate the staff were about what they were doing, I was surprised to learn that there was no research being undertaken to evidence the impact of the support for adolescents. From this, I developed a passion for research that explores the benefits of interventions and demonstrates the impact on adolescent outcomes. For the next four years I worked at a children's charity, researching the effectiveness of various interventions for children

and adolescents including school breakfast clubs, school-based counselling, and the support of school nurses. In visiting various schools across the country, I was acutely aware of how tight resources were and how passionate staff were about promoting positive mental health and wellbeing to their pupils. To me, this passion was particularly acute in more deprived schools, where children and adolescents generally faced harder life circumstances. Coming from this background, this inevitably influenced the setting of the school that participated in the research, which was a school in a highly deprived area. I believe that this is arguably where wellbeing interventions may be most beneficial. Therefore, with the funding awarded through this PhD, I chose to equip a school with the resources to deliver yoga and mindfulness interventions for two terms (across two years).

I believe that my past research experience also influenced the design in terms of the mixed methodology adopted. My previous research spanned both quantitative and qualitative methods and I had seen the benefits that each could bring when exploring the effectiveness of interventions. Whilst decision-makers may like the 'hard numbers' that quantitative methods offer, in order to explore how and why interventions might work, it is important to listen to the people experiencing them; what did they like, what did they not like, what could be improved? Listening to children and adolescents in this context is very important. So often schools introduce new workshops, programmes, or classes and do not ask the children and adolescents how they perceived them. Given schools operate on such tight budgets, having this insight is important to better understand what types of interventions they, themselves, perceive as helpful.

In contrast to my experience in school-based and mixed methods research, my experience in terms of yoga and mindfulness was limited. Before embarking upon this research, I had only been to a handful of yoga classes and listened to the HeadSpace app for a few weeks. I would consider myself a novice. Whilst I was originally concerned that this did not qualify me to conduct research in this field, in reading the available literature,

I came to appraise my relative objectivity in a fairly positive light; I was not going into this research project with any preconceived notions or personal investment in these interventions 'working'. Instead, I went in with an open mind, which on reflection, I believe enabled equal and unbiased probing for both positive and negative views and experiences within the qualitative interviews with adolescents and professionals.

Within the interview process, I was motivated to consider my identity (my age, gender, ethnicity, and profession) and how these demographic factors affected the dynamics within the interviews. These dynamics were different in my interviews with adolescents, in comparison to professionals. In my interviews with groups of adolescents, I was very aware of going in and positioning myself as a 'curious adult' who simply wanted to learn from them. This was helped by my novice status in the yoga and mindfulness world, which helped to place the participant as the 'expert' which fitted well with the curious adult standpoint. From my past experiences and in reading around the power dynamics that exist in researcher-child dynamics I was also confident that my age and gender would be an advantage in helping adolescents to see me as approachable and comfortable offering their honest opinions. Furthermore, adopting group interviews helped to put the power in the hands of adolescents. However, it was challenging for me at times to allow adolescents to openly discuss their experiences whilst trying to keep them on topic, given I only had up to 45 minutes to talk to them.

In contrast, I was very aware of my age in my interviews with professionals; I was conscious that some of them may have viewed me as inexperienced, which may have affected how they interacted with me. My novice status in the yoga and mindfulness world was a larger concern to me when interviewing intervention facilitators in particular, who sometimes used terminology that I was not familiar with. Nevertheless, I continued to adopt my curious researcher standpoint with these participants, asking them to clarify and/or elaborate on their points. Whilst initially I was worried about how this lack of

knowledge would be perceived, intervention facilitators responded well to my questions. Indeed, having analysed the data in depth, I am confident that I gleaned comprehensive, relevant, and interesting data from my interviews with both adolescents and professionals.

With participants giving up their valuable time to talk to me and having spent over thirty hours interviewing adolescents and professionals, I was highly motivated to do justice to participants' accounts of their experiences of the interventions within the analysis process. Given the highly individualised nature of mind-body interventions for adolescents, I recognised the importance of drawing out divergences in experiences; what works for some, does not work for everyone. However, I did feel that there were some tensions in the data; most notably where adolescents commented about one intervention facilitator demonstrating reactive practices. On the one hand, I was grateful that the adolescents felt comfortable discussing more negative experiences and felt that this was owed to my curious adult stance. On the other hand, I felt like this put me in an awkward position, holding knowledge about certain facilitators. I was particularly conscious that I didn't want this knowledge to unduly influence my interpretation of the data. Similarly, there were some tensions in the qualitative data provided by professionals, where intervention facilitators and school staff held different positions on key issues such as behavioural management policies. I was acutely conscious that both views were equally valid and deserved to be explored and considered. This required sensitive handling and writing up of the data to communicate these findings in a non-judgemental way, owing to the expertise of both sets of professionals.

When analysing the professionals' qualitative data in particular, I felt myself connecting with the viewpoint of school staff. Ultimately, most school staff held positive expectations about what mind-body interventions could achieve for adolescents and were open to these benefits becoming a reality. However, they were also realistic and grounded in their stance, reflecting on the challenges of resources, staff time, and change within the

school context. On a personal level, I felt like I shared this viewpoint and appreciated the honesty in their reflections regarding organisational barriers. Whilst their viewpoint resonated with me, having not worked in a school, I cannot fully appreciate their frustrations. Nevertheless, I feel like it echoed my previous school-based research where good intentions can be affected by organisational barriers. However, it has also made me appreciate the variation between settings; each school has its own hierarchies, dynamics, and community, which inevitably affect why and how interventions such as these are adopted.

In reflecting on my personal experiences of conducting this research, there have been notable highs and lows. I feel incredibly honoured and proud to have helped a school to develop its wellbeing provision for adolescents, particularly in the context of rising mental health and wellbeing issues exacerbated by the COVID-19 pandemic. However, I have moral and ethical reservations about providing the school with interventions that may help for only two terms, without any more long-term support. With the help of the interventional facilitators involved in Year Two, there were attempts to try and teach school staff some basic practices that they could use with their pupils. However, I am sceptical that one short training session provides school staff with the skills and confidence to integrate these practices into their everyday teaching. Despite this, I am aware that some of the yoga and mindfulness intervention facilitators reached out and offered their services to the school for a highly discounted rate (or free). I am hopeful that the school takes up these offers to enable the continuation of mind-body interventions.

My lasting take-away from conducting this research is that interventions that promote and support the mental health and wellbeing of adolescents are needed now, more than ever. I hope that this research may inspire other schools to implement interventions such as these, and future researchers to explore the impact of mind-body interventions with a wider range of UK-based schools.

2. Literature Review

2.1 Overview of Chapter

This chapter begins with an overview of mental health and wellbeing problems in childhood and adolescence in the UK, covering the apparent increase in the prevalence of mental health issues, the intersection between mental health and deprivation, and the impact on life-course outcomes. In response, the support available for childhood and adolescent mental health and wellbeing problems is described, with high clinical thresholds and long waiting times reducing the efficiency of health services. As such, recent health and educational policies have focused on the role of schools in preventative mental health and wellbeing support. Two interventions, namely yoga and mindfulness, have gained popularity in recent years as appropriate school-based interventions due to their positive impact on a range of outcome measures. An overview of this research is provided, highlighting key strengths and limitations of the evidence base to date. Building upon the gaps within the yoga and mindfulness field, the rationale for the current research is provided, contributing an exploration of these interventions with a new and diverse population.

2.2 Adolescents Mental Health and Wellbeing

2.2.1 Definitions of Mental Health and Wellbeing

> "Health is a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity."

> (World Health Organisation [WHO], 1946, para 1)

Over 75 years ago, the WHO (1946) proposed a definition of health, which put physical, mental, and social wellbeing at the heart of what it means to be healthy. Prior to World War II, the dominant view of health was related to absence of illness or disease,

(Cooke et al., 2016). However, the WHO's definition moved beyond this, including positive mental health wellbeing as a central tenet of health.

Varying conceptualisations of wellbeing have been proposed; arguably the most influential are eudaimonic and hedonic approaches to wellbeing (Lent, 2004; Ryan & Deci, 2001). Hedonic wellbeing is focused on pleasure and happiness (Kahneman et al., 1999; Ryan & Deci, 2001). This is also conceptualised as subjective wellbeing, which has various definitions but is generally considered to include mood and emotions, as well as global judgements of life satisfaction (Diener et al., 1999), synonymous with positive mental health (Ruggeri et al., 2020). In addition, eudaimonic approaches are focused on fulfilling one's potential and flourishing (Lent, 2004; Ryff & Keyes, 1995). This is also conceptualised as psychological wellbeing which proposes that wellbeing is informed by life purpose, personal growth, mastery of the environment, autonomy, self-acceptance, and positive relationships with others (Ryff, 1989; Ryff & Keyes, 1995). Other approaches to defining wellbeing focus on quality of life (Frisch, Cornell, Villanueva, & Retzlaff, 1992) and wellness (Dunn, 1961 as cited in Palombi, 1992).

Despite the different approaches to wellbeing, there is still a lack of consensus as to how it is defined and what constitutes wellbeing (Forgeard et al., 2011; Selwyn & Wood, 2015). Nevertheless, given the overlap in the conceptualisations of wellbeing, there is overarching agreement that wellbeing can be considered multidimensional (Kern et al., 2015; Ruggeri et al., 2020). Therefore, the current thesis aligns itself with the definition of wellbeing proposed by Weare (2015), which highlights this multi-dimensional understanding:

> "A state of positive mental health and wellness. It involves a sense of optimism, confidence, happiness, clarity, vitality, self-worth, achievement, having a meaning and purpose, engagement, having supportive and satisfying relationships with others and understanding oneself, and responding effectively to one's own emotions."

(Weare, 2015, p. 3)

Whichever definition is adopted, there is growing acceptance that wellbeing plays a crucial role in mental health and is increasingly acknowledged alongside mental health. The term wellbeing is also favoured in some settings, such as universal education and health services, where there is a focus on promoting wellbeing and preventing mental ill-health (Powell et al., 2015).

2.2.2 Prevalence of Mental Health and Wellbeing Problems in Childhood and Adolescence

There is growing acceptance that mental health is just as important as physical health and is integral for children to grow up into healthy, well-rounded adults. However, a review conducted by UNICEF (2007) revealed that British pupils were amongst the most unhappy in the western world. Ten years later, the Good Childhood Report (The Children's Society, 2017) revealed that the happiness levels of children and adolescents in the UK were at their lowest since 2010. Compared with 23 other European countries, it was observed that the UK ranked lowest for the proportion of children and adolescents with high life satisfaction (The Children's Society, 2020). Consistent with the downward happiness trajectory, there is considerable evidence that children and adolescents have increasing rates of mental health and wellbeing issues (Hagell, 2012). Indeed, the NHS routinely measures the prevalence of childhood and adolescent mental health and wellbeing problems through a nationally representative survey in the UK. Over a decade ago, 11.5% of children and adolescents aged between 11 and 16 years old had a mental health condition, with the most common conditions being conduct disorders, anxiety, and depression (Green et al., 2005). This survey was conducted again in 2017[2], to find that 13% of children and adolescents had a mental health problem (Sadler et al., 2018).

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[2] A more recent version of the survey was conducted in 2020, in the midst of the COVID-19 pandemic, which revealed a higher rate of mental health and wellbeing issues. This is described in Chapter 10, Section 10.4.1.

Particularly, emotional disorders had become more common over the past twenty years for those aged between 5-15 years old (Sadler et al., 2018).

This nationally representative data is consistent with the perceptions of professionals working with children and adolescents. Youth organisations and medical professionals have reported a perceived growth in mental health issues from 2011 to 2016 (Association for School and College Leaders & National Children's Bureau, 2016; Powell et al., 2015). Indeed, 90% of school staff reported witnessing an increase in the number of pupils experiencing anxiety or stress. This was in addition to 84% perceiving an increase in low mood or depression and similar proportion describing increases in cyberbullying (81%) and self-harm and suicidal ideation (79%; Association for School and College Leaders & National Children's Bureau, 2016).

A systematic review exploring childhood and adolescent mental health and wellbeing problems in the 21st century further contributed to the literature pointing to an increase in rates of mental health problems, exploring changes in internalising symptoms (Bor et al., 2014). Internalising symptoms include sadness, anxiety, depression, hypersensitivity, and loneliness (in contrast to externalising problems, such as hyperactivity, antisocial behaviour, and aggression; Levesque, 2011; Weeks et al., 2016). Internalising symptoms have a negative impact quality of life, mental health, and wellbeing (Schulte-Körne, 2016). In their systematic review of the literature, Bor et al., (2014) observed that there was an increasing symptom burden for internalising symptoms in recent cohorts of adolescents, especially for adolescent girls (Bor et al., 2014). As such, it can be concluded that there are specific observable increases in mental health and wellbeing problems for children and adolescents in the 21st century. Despite these estimates of mental health prevalence, it is difficult to accurately assess increases in mental health problems. Instead, the changing trajectory of mental health problems is

dependent on several factors, including symptom types, gender, and developmental stage (Bor et al., 2014).

2.2.3 Intersection Between Mental Health and Socioeconomic Status

Mental health and wellbeing problems are on the rise for children and adolescents generally, however research has identified various factors that put individuals at heightened risk of developing mental health problems. To this end, socioeconomic status (SES) has been repeatedly linked with mental health outcomes. Indeed, low SES affects many areas of life, including access to education, housing quality, income distribution, physical health, and healthcare utilisation (Reiss, 2013). Subsequently, there is a negative association between SES and mental health; low levels of SES are associated with higher rates of mental health and wellbeing issues (Ayre, 2016; McLaughlin et al., 2012; Mcleod & Shanahan, 1993; Patalay & Fitzsimons, 2018; Rutter, 2003).

Consistent with this, adolescents living in poverty have reported poorer wellbeing; they have reported feeling less useful, they are less positive about their future, feel like a failure more often in comparison to their more affluent peers (Ayre, 2016) and report feeling more worthless (Heshmat et al., 2016). Similarly, the most recent sweep of the longitudinal UK-based Millennium Cohort study (MCS) observed that one in four girls and one in ten boys reported high levels of depressive symptoms at age 14, with low family income found to be a significant predictor of poorer mental health and wellbeing (Patalay & Fitzsimons, 2018). While both of these studies explored family or household income, research has also highlighted the link between low SES neighbourhoods and mental health problems. This may be partly related to the violence and crime within low SES neighbourhoods, where children and adolescents are more likely to be exposed to violence (either as victims, witnesses, or perpetrators) in comparison to high SES areas (Buckner et al., 2004). These increased levels of neighbourhood violence have been

associated with increased depression and anxiety for adolescents (Buckner et al., 2004; Fitzpatrick et al., 2005).

Considering these findings, research has sought to quantify the increased risk of low SES. To this end, the most recent nationally representative survey of mental health prevalence rates in the UK showed that children and adolescents living in low-income households were twice as likely as their more affluent peers to be diagnosed with a mental health condition (Sadler et al., 2018). These rates were consistent with a systematic review, which concluded that children from low SES backgrounds were two to three times more likely to develop mental health problems (Reiss, 2013). This association was persistent across all age groups and genders; however, SES was more strongly associated with mental health problems in children and pre-adolescents (under 12 years). Longitudinal studies specifically highlighted that children and adolescents who lived in persistent disadvantage were more susceptible to mental health problems (Reiss, 2013).

There are a number of proposed theories to account for the association between SES and mental health. Primarily these theories relate to indirect effects of SES, adversely affecting physical and psychosocial resources (Bøe et al., 2018; Dearing, 2008), in line with social causation views of SES influence (Conger & Donnellan, 2007). The first indirect pathway may be through the increase in environmental and household risk factors. The Family Stress Model proposes that economic hardship causes additional stressors within the household (Conger & Donnellan, 2007). Consistent with this, research has shown that stressful life events are more common for low SES families; these may include financial crises, loss of employment, parental mental health, divorce or separation, childhood problems at school, and/or criminal activity. Therefore, children and adolescents living in low SES households may be exposed to increased chaos, unpredictability, and instability in comparison to high SES households. Further evidencing this relationship, Reiss et al. (2019) highlighted that the number of stressful

life events was positively correlated with increased childhood and adolescent mental health problems over the course of two years. This is consistent with previous research that has shown the significance of cumulative negative events in explaining the relationship between SES and mental health (Appleyard et al., 2005; Bøe et al., 2018). Therefore, this suggests the negative impact of poverty-related factors on the mental health of adolescents, particularly for those living in chronic poverty.

In addition to increasing environmental and household risk factors, the relationship between low SES and mental health may be partially mediated by familial interpersonal relationships and resources. The Family Investment Model theorises that parents from low SES have less financial capital and lower levels of education and/or occupations, which reduces their ability to provide the optimal material conditions and engage in positive parenting behaviours with their children (Conger & Donnellan, 2007). In support of this theory, research has observed that low SES parents are more likely to experience mental health problems themselves, which may negatively impact upon their parenting (Devenish et al., 2017; Ponnet et al., 2013). In addition to parental mental health problems, parenting style was also implicated in the association between adolescent mental health and SES (Devenish et al., 2017; White et al., 2015). In line with this, research has was observed that low SES mothers displayed less maternal care and warmth, which was associated with higher levels of adolescent depression (Kirby et al., 2020; Xu et al., 2019). This body of research supports the indirect effects of low SES on adolescent mental health, mediated by the effects of the parent-child relationship. Nevertheless, not all low SES families display these patterns; for example, in a study of families living in extreme poverty in the UK, family cohesion, cultural identity, and warm parent-child relationships were identified as protective factors that appeared to buffer the effects of chronic poverty on mental health and wellbeing (Stansfeld et al., 2004).

2.2.4 Impact of Childhood and Adolescent Mental Health Problems

Given the increasing rates of childhood and adolescent mental health problems and additional risk factors for those from low SES, it is important to consider the long-term impact of these issues on adolescents' development and life chances. Indeed, mental health problems in childhood and adolescence can have longstanding negative impacts (Colman et al., 2007; Fergusson et al., 2005). Utilising UK birth cohort studies, research has consistently shown that childhood mental health issues are associated with an increased risk of school absence and disrupted education, which is linked to a higher risk of poor educational attainment (Goodman et al., 2011; Sainsbury Centre for Mental Health, 2009).

In addition to poorer educational attainment, research has observed a strong relationship between mental health problems in childhood and further impact on professional outcomes. From longitudinal data, it was revealed that children and adolescents with conduct disorder were more likely to be economically inactive in later life, in comparison to their peers without conduct problems (Colman et al., 2007; Sainsbury Centre for Mental Health, 2009). Goodman, Joyce, and Smith (2011) further evidenced this link, to find that childhood psychological problems, not just conduct problems, were associated with a net loss of up to 28% of family earnings. Children and adolescents with emotional problems were also found to be at heightened risk of involvement in criminal activity, with increased odds of a past arrest or court conviction for individuals with a history of childhood or adolescent conduct problems (Sainsbury Centre for Mental Health, 2009). Khan et al. (2015) estimated the odds in relation to the general population and suggested that individuals with childhood mental health and wellbeing problems were up to 20 times more likely to end up in prison.

Moreover, there is substantial evidence that mental health issues that present during childhood and adolescence persist into adulthood (Kim-Cohen et al., 2003).

Colman et al. (2007) found that adolescent-onset depression was associated with recurrent depression throughout adulthood; only 14% of the sample did not show persisting emotional problems into adulthood. Clark, Rodgers, Caldwell, Power and Stansfeld (2007) estimated that adolescent emotional problems doubled the risk of a clinical depressive or anxiety episode in adulthood. In addition to emotional problems in adulthood, these individuals were also found to be at an increased risk of mortality. Childhood externalizing and internalizing behaviours were found to predict increased mortality between 11 and 46 years of age; thus, individuals with high levels of problem behaviours in childhood had a heightened risk of mortality in adulthood (Jokela et al., 2009). In comparison to their healthy peers, it was estimated that children with emotional problems were six times more likely to die before age 30 (Khan et al., 2015), which is well below half of the average life expectancy in the UK.

Notwithstanding the costs to individuals affected by childhood mental health and wellbeing problems, there is also a substantial impact on the health service and national economy (Murphy & Fonagy, 2013). In the financial year ending in April 2013, NHS expenditure on child and adolescent mental health disorders was estimated to be over £700 million (NHS England and DoH et al., 2015). Per child, the estimated spend was estimated to be between £11,030 and £59,000 annually for those with mental health problems (Murphy & Fonagy, 2013). Furthermore, the cost of adult mental health problems, many of which continue on from childhood, was estimated to be over £1 billion (Centre for Mental Health, 2009). Such high figures point to the benefits of early intervention and prevention strategies, which help reduce crisis points and avoid expensive treatment interventions through into adulthood (NHS England and DoH et al., 2015).

2.2.5 Support for Childhood and Adolescent Mental Health Problems

Despite the wealth of evidence regarding the growing prevalence of mental health and wellbeing problems and the detrimental effect these can have on life outcomes, not all children and adolescents get the support they need. It is estimated that only 30-40% of children and adolescents who have experienced clinically significant difficulties have had support at an early age (NHS England and DoH et al., 2015). For those who did receive a referral to support, rejected referrals and long waiting times affected their help-seeking pursuits. Over a quarter of children and adolescents referred to child and adolescent mental health services (CAMHS) were not allocated a service (Children's Commissioner, 2016; Frith, 2017). This is possibly due to high clinical thresholds, meaning that only sufficiently severe cases could access CAMHS (Children's Commissioner, 2016). For those who were eligible, waiting times ranged from 14 to 200 days (Children's Commissioner, 2016). When looking at the averages, the typical waiting times were found to be 33 days for assessment and 56 days for treatment, however there was large variation across the country. Indeed, children and adolescents in London were amongst the individuals who had to wait the longest time for treatment to start (100 days+; Frith, 2017). Long waiting timings could significantly impact and worsen symptoms of mental ill-health (Brown et al., 2002; Williams et al., 2008).

In addition to CAMHS related barriers, children and adolescents themselves are active agents in the support offered to them, yet many were reluctant to seek professional help (Rickwood et al., 2007). This pattern of help seeking behaviour is consistent with theories of brain development, which specify adolescence as a time of emotionally charged thinking patterns and risky behaviour choices (Casey et al., 2008; Dahl, 2004). Subsequently, even at the highest levels of anxiety and depression symptoms, less than a third of children and adolescents sought help from a professional (Zachrisson et al., 2006). When children and adolescents did seek professional help, this was most likely to be from

a familiar source, such as a school-based professional (Rickwood et al., 2007), which points to the importance of familiarity in the mental health help-seeking behaviours of children and adolescents.

Given the limited access and willingness to engage in help seeking behaviours, The Children and Young People's Mental Health and Wellbeing Taskforce was established in 2014, with the aim of making it easier for children and their parents or carers to access much-needed help and support (NHS England and DoH et al., 2015). As a part of this task force, the report *Future in Mind* was published, which drew out three overarching principles for addressing children and adolescents' mental health and wellbeing: (1) the promotion of good mental health, wellbeing and resilience by supporting children and families to develop behaviours that support good mental health; (2) the prevention of mental health problems by taking early action; and (3) early identification of need to ensure children and adolescents are supported in a timely manner to try and prevent more serious problems developing (NHS England and DoH et al., 2015).

In line with these overarching principles, universal services were emphasised as crucial for achieving progress in regard to the promotion of wellbeing (White et al., 2017). Schools were recognised as uniquely placed to play a vital role in promoting wellbeing and preventing the development of mental health problems for children and adolescents (NHS England and DoH et al., 2015), as well as early identification and intervention (DoH et al., 2017). Subsequently, research has highlighted that almost all schools and colleges felt they had an ethos that promoted mutual care and concern, and two-thirds felt the promotion of mental health and wellbeing was integrated into the school day (DfE et al., 2017). Thus, schools recognised the importance of supporting the mental health and wellbeing of pupils. However, financial barriers were acknowledged by nearly three-quarters of schools in their efforts to integrate mental health and wellbeing provision into

their school, particularly for mainstream schools (DfE et al., 2017). As such, cost-effective interventions are needed to reduce the burden on schools.

In line with the policy context and moving away from treating specific mental health problems separately, schools have begun to adopt universal interventions that promote mental health and wellbeing more generally (NHS England and DoH et al., 2015). Universal interventions are those that target general population groups (O'Connor et al., 2018); in a school this may be where all children and adolescents within certain communities (e.g., a whole class, year group, or school population) are eligible to participate in interventions. This contrasts with targeted interventions, which are only delivered to specific groups of individuals who have been identified as having a particular characteristic or need (e.g., anxiety, depression, disrupted behaviour, risk of school drop-out etc.). One of the main ways that schools in England have reported implementing universal approaches to mental health and wellbeing is through the PSHE education curriculum (Taggart et al., 2014). As of September 2020, health education (as a part of PSHE) became compulsory in all state-funded schools in England (DfE, 2019). The DfE (2019) issued specific guidance about the objectives of mental health and wellbeing education for secondary school pupils, including teaching adolescents how to talk about emotions and equipping them with the vocabulary to do this, common types of mental health problems, the impact of certain actions on the mental health and wellbeing of themselves and others, and the benefits of physical activity for mental wellbeing. The guidance stated that schools have the flexibility to design, plan, and deliver age-appropriate PSHE content, with the freedom to decide how to deliver lessons that encompass the learning objectives set out in the guidance (DfE, 2019).

The guidance for health education specifically referenced the reduction of stigma attached to mental health and wellbeing issues and encouraged schools to ensure their teaching practices facilitated a non-judgemental approach (DfE, 2019; PSHE

Association, 2019). The school environment generally has been identified as non-stigmatising, which can make support offered in this environment appear more acceptable for pupils and their families (DoH et al., 2017). Universal delivery methods specifically may increase the social acceptance of mental health and wellbeing interventions, as all children and adolescents participate, regardless of need, vulnerability, or risk factors. In this way, there is no risk of singling out pupils as having a pre-identified need; which is more likely when selecting pupils to participate in targeted interventions (Gronholm et al., 2018). As such, universal interventions enable wider distribution, delivering interventions to a larger and more diverse group of participants (Fazel et al., 2014; Van der Gucht et al., 2016). Moreover, ethically and morally, all pupils are given an equal opportunity to learn the skills and strategies to better manage their mental health and wellbeing (Fazel et al., 2014; Van der Gucht et al., 2016).

When considering the adoption of universal school-based mental health and wellbeing interventions, Weare (2015) reported that there were "thousands" (p. 130) of interventions being implemented across the UK and internationally. These fall under many different names including mental health, wellbeing, social and emotional learning, emotional literacy, emotional intelligence, resilience, life skills, and character education. Whichever term is used, these interventions are generally understood as age-appropriate interventions that support children and adolescents to recognise and manage emotions, set and achieve goals, feel and show care and concern for others, make responsible decisions in challenging situations, and establish positive relationships with the self and others (CASEL, 2015; Zins & Elias, 2007). These learning objectives align with the guidance for the new PSHE curriculum (DfE, 2019).

A growing number of schools have started implementing preventative interventions to enhance mental health and wellbeing for children and adolescents (Clarke et al., 2021); activities that are aligned with the aims of the PSHE curriculum. In a review

of the literature, Clarke et al. (2021) identified five main approaches to preventative interventions; social and emotional learning, positive psychology, yoga and mindfulness, positive youth development, and mental health literacy interventions. Preliminary research exploring what has been implemented in schools suggests that the focus of implementation has been on yoga and mindfulness interventions (Clarke et al., 2021; Cozzolino, 2021). This is particularly evident in the US, with over 45 mindfulness interventions (Garrison Institute 2014, as cited by Mindfulness All-Party Parliamentary Group, 2015) and 36 school-based yoga programmes (Butzer, Ebert, Telles, & Khalsa, 2015) identified as in use at the time of publication. The UK has been slower in developing and implementing mind-body practices within schools, however in recent years, there has been exponential growth in the availability of yoga and mindfulness interventions for school-aged children in the UK (Mindfulness in Schools Project, n.d; Yoga in Schools, n.d). This may be partially due to the growing evidence base highlighting the positive effects of these practices for a range of cognitive, psychological, and social outcomes (Dunning et al., 2018; Khalsa & Butzer, 2016). Indeed, Clarke et al. (2021) found that research into yoga and mindfulness interventions was growing at a faster rate than other preventative interventions. With the growth of both the evidence base and availability of yoga and mindfulness interventions, increasing numbers of UK schools have begun offering yoga and mindfulness interventions for children and adolescents, in line with the aims of the PSHE curriculum guidance, and supporting pupils to develop more positive cognitions, affect, and behaviours.

Yoga and mindfulness interventions will be the focus of the subsequent sections of this literature review, providing an overview of the mechanisms of each and the current evidence base.

2.3 Yoga Interventions

2.3.1 Overview of Yoga and Mechanisms of Change

Yoga is a holistic system of practices that, in its traditional form, includes multiple techniques in engaging both the body and the mind and incorporates moving through a set of organised, sustained postures (asanas), mental imagery, breath control, and meditation (Case-Smith et al., 2010). According to Butzer et al. (2016), yoga includes four primary components which individually and in combination have beneficial effects: (1) physical postures and exercise promote flexibility and physical strength; (2) breathing exercises improve respiratory functioning; (3) relaxation techniques help to release physical and mental tension and stresses and; (4) meditation enhances mind-body awareness and improves attention and emotional regulation skills. Through the activation of all of these components, yoga has the potential to have positive effects on mental health, physical health, behaviour, and performance (Butzer et al., 2016). Consequently, Butzer et al. (2016) proposed a model of how yoga practice leads to improvements on all of these elements (Figure 1). This model is consistent with the outcomes observed in the evidence base (see Section 2.3.2), suggesting a broad range of benefits associated with yoga practice (Cook-Cottone et al., 2018; Ferreira-Vorkapic et al., 2015; James-Palmer et al., 2020; Khalsa & Butzer, 2016; Miller et al., 2020).

Figure 1.

Hypothesised Associations Between Yoga Practice and Proposed Outcomes.

Yoga Practices
(postures, breathing, relaxation, meditation)

Mind-Body Awareness
↑Mindfulness
↑Attention
↑Concentration/Cognition
↑Self/Social Awareness

Self-Regulation
↑Emotion Regulation
↑Stress Regulation
↑Resilience
↑Equanimity
↑Psychological Self-Efficacy

Physical Fitness
↑Flexibility
↑Strength
↑Balance
↑Respiratory Function
↑Physical Self-Efficacy

Behaviours, Mental State, Health and Performance
↑Mood, ↑Well-Being, ↓Psychological Disorders,
↑Positive Behaviours, ↓Negative Behaviours, ↑Physical Health,
↑Cognitive/Academic Performance, ↑Relationships, ↑Quality of Life

Note: Taken from Butzer et al. (2016, p. 8).

There are two primary mechanisms proposed through which yoga supports self-regulation, stress management, and wellbeing. The first is through psychological mechanisms, including facilitating more positive attitudes to stress, self-awareness, coping mechanisms, calmness and relaxation, compassion, and mindfulness (Riley & Park, 2015). Indeed, mindfulness was proposed as a crucial link between yoga, reducing stress, and increasing wellbeing. Described by Khalsa et al. (2009), yoga was referred to as "meditation in motion" (p. 281) for the attention required within the bodily movements and asana, where attention is often directed to a specific part of the body or on an internal state (e.g., the breath). Through the focus of attention on these external and internal states, participants are encouraged to disengage from distractors. Therefore, it is theorised that attentional flexibility and control may reduce negative forms of thinking and rumination through maintaining awareness of bodily sensations (Gard et al., 2014). Similarly, positive reappraisal of emotions and/or situations may also reduce negative thoughts. Indeed, yoga teaches a more objective, observational, and non-judgemental stance to

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thoughts, emotions, and experiences, which encourages an ability to better tolerate negative situations (Gard et al., 2014). These mechanisms are largely similar to the theories of mindfulness (see Section 2.4.1; Bishop et al., 2004; Shapiro et al., 2006). To this end, yoga has been found to increase mindfulness skills, which is associated with lower levels of stress and higher levels of wellbeing (Gard et al., 2012; Riley & Park, 2015).

In addition to psychological mechanisms, yoga has also been proposed to have biological mechanisms, given the large physical component within the practice. Indeed, it is this physical component that arguably makes yoga more developmentally appropriate for children and adolescents, in comparison to static meditative practices (Rashedi et al., 2021). In returning to the model proposed by Butzer et al. (2016), yoga also operates though physiological bottom-up processes (Gard et al., 2014; Pascoe et al., 2017). The aerobic component of yoga practice facilitates benefits for neurological, hormonal, metabolic, and respiratory functioning (Gard et al., 2014). More specifically, many of the practices involved in yoga (e.g., breathing, savasana etc.) activate the parasympathetic nervous system (PNS)[3], which stimulates the relaxation response (Riley & Park, 2015). Similarly, the stimulation of pressure receptors during yoga practice has been theorised to enhance vagal activity[4], supporting PNS activation, leading to a decrease in stress hormones and an increase in relaxation (Riley & Park, 2015). In addition to PNS activation, yoga also down-regulates the hypothalamic-pituitary-adrenal axis (HPA)[5], which reduces the release of stress hormones, such as cortisol, facilitating states of relaxation (Riley & Park, 2015; Ross & Thomas, 2010; Stephens et al., 2012). A reduction

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[3] The PNS is one of the two divisions of the autonomic nervous system; it is the 'rest and digest' division (in comparison to the sympathetic nervous system, which drives the 'fight or flight' response in stressful circumstances (Tindle & Tadi, 2020).

[4] The vagus nerve is the main component of the PNS, carrying information between the brain and internal organs (Breit et al., 2018).

[5] The HPA axis is implicated in the stress response' activation triggers the production of cortisol (Stephens et al., 2012).

in cortisol has been repeatedly associated with decreases in stress and anxiety and improvements in mood (Banasik et al., 2011; Butzer, Day, et al., 2015; Cruess et al., 1999; Thirthalli et al., 2013; Vadiraja et al., 2009). Therefore, yoga may lead to the range of benefits proposed by Butzer et al. (2016) by activating both top-down self-regulatory processes and changes in physiology and neurological underpinnings. Nevertheless, as noted by Gard et al. (2014), it may not be possible to capture all the mechanisms of how yoga may perpetuate the range of benefits found in the literature; therefore, additional research is needed to elucidate further mechanisms of change.

2.3.2 The Impact of Yoga for Children and Adolescents

The evidence base exploring the impact of yoga interventions for children and adolescents is a rapidly growing field, with significant growth since 2010, especially in the United States (US; Khalsa & Butzer, 2016). Nevertheless, Butzer et al. (2016) noted that the yoga field was generally still in its infancy, albeit this was over five years ago. However, there is considerable variability in the rigour and quality of the existing evidence base of yoga with children and adolescents (Khalsa & Butzer, 2016). Considering this, the methodological limitations have been highlighted to provide additional context.

2.3.2.1 Quantitative Evidence. Owing to the variation in evidence quality within the field, this section will focus on yoga-based research reviews, systematic reviews, and meta-analyses, drawing together individual studies exploring the impact of yoga for children and adolescents. Where appropriate, individual studies are highlighted to provide additional context and examples.

The popularity of yoga has created a need for empirical studies to explore the efficacy and effectiveness of yoga interventions. Individual quantitative studies have largely pointed to positive results. However, it was not until around 2010 that the first

systematic reviews and meta-analyses in the field were published, exploring the impact of yoga on children and adolescents psychological functioning and cognition[6]. These publications consolidated the literature in relation to yoga for children and adolescents, combining the results of multiple individual studies. These systematic reviews and meta-analyses have not always reached such favourable outcomes, mainly pointing to more limited effects on wellbeing and cognition, with smaller effect sizes. Moreover, these systematic reviews and meta-analyses offered commentary on the state of the evidence base, including the rigour and quality, urging researchers to advance the field using more robust methods.

In 2010, Kaley-Isley et al. (2010) conducted an analysis of the clinical literature with regard to yoga for children and adolescents for reducing attention problems and mental health problems. From their review of the literature, they found that the majority of studies that explored the impact of yoga on attention found positive results, with yoga decreasing symptoms of Attention Deficit Hyperactivity Disorder and increasing focus and concentration (Abadi et al., 2008; Harrison et al., 2004; Jensen & Kenny, 2004). They also found a largely consistent pattern in reducing problem or disorder-related behaviours and the promotion of positive affective states (Benavides & Caballero, 2009; Powell et al., 2008; Vaishnav et al., 2018). Whilst positive, Kaley-Isley et al. (2010) did note methodological limitations, such as few Randomised Control Trials (RCTs), small sample sizes, and limited detail regarding the specifics of the yoga intervention. Subsequently, they recommended that future research should employ randomised designs, with larger numbers of participants to increase statistical power, with longer-term follow up periods. However, it should be highlighted that Kaley-Isley et al.'s (2010) focus was on the clinical literature, limiting the generalisability of the findings. However, the findings were consistent with other systematic reviews of yoga with clinical populations.

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[6] Before 2010, reviews or meta-analyses of yoga for had generally focused on the physical health and developmental benefits (Birdee et al., 2009; Galantino et al., 2008).

In contrast, Serwacki and Cook-Cottone (2012) conducted a systematic review of yoga in schools, with application to non-clinical settings. Of twelve eligible studies, the majority were conducted in public schools in the US, with India, Germany and England contributing the remainder of the sample, suggesting the emphasis within the research field on yoga in American schools. Specifically, for atypically developing children and young people, Serwacki and Cook-Cottone (2021) concluded that school-based yoga interventions have the potential to enhance emotional balance, positive self-concept, attentional control, and cognitive efficacy. Yoga was also found to decrease anxiety, negative thought patterns, emotional arousal, and reactivity. Whilst these findings emphasised the positive impacts of yoga for children and adolescents, the researchers concluded that the majority of the studies were of low to medium methodological quality. Studies suffered from limited rigour, including small sample sizes, lack of randomisation, and large variation between yoga interventions, making comparisons between studies more challenging.

Ferreira-Vorkapic et al. (2015) built on Serwacki and Cook-Cottone's (2012) systematic review, specifically reviewing the evidence from RCTs of yoga programmes in schools. Nine RCTs were included in the systematic review, which specifically explored the impact on cognition and wellbeing. The evidence for cognitive-related benefits demonstrated improvements in memory and attention (Rao & Sarokte, 2013; Telles et al., 2013; Verma et al., 2014). In terms of the impact on psychological wellbeing, more mixed findings were observed. More specifically, three of the six studies included observed improvements on measures such as anger control (Khalsa et al., 2012), anxiety and negative affect (Noggle et al., 2012), and stress and self-control (Ramadoss & Bose, 2010). In contrast, the other three studies reviewed showed adverse effects of yoga interventions, demonstrating poorer stress-related outcomes in comparison to a control group (Haden et al., 2014; Hagins et al., 2013; White, 2012). Therefore, for psychological

wellbeing, Ferreira-Vorkapic et al. (2015) concluded that no definitive conclusions could be drawn from the conflicting findings. Instead, they hypothesised why the findings may be mixed; they theorised that the findings may be affected by the age groups' immature level of attentional control needed for engagement in these interventions and the variation in the intervention type and dosage. Therefore, there are important potential benefits of school-based yoga, however Ferreira-Vorkapic et al. (2015) noted methodological challenges similar to past reviews.

In the same year, Weaver et al. (2015) conducted a systematic review of yoga interventions for anxiety reduction for children and adolescents. They identified 16 studies eligible for inclusion in their review, including RCTs, uncontrolled trials, pre-post designs, and case studies. Taking the evidence together, they concluded that yoga may be effective in reducing anxiety and/or anxiety-related symptoms for children and adolescents. Interestingly, it was noted that the more intense or high frequency interventions demonstrated effects most significantly and consistently (Khalsa et al., 2012; Noggle et al., 2012; Stueck & Gloeckner, 2005). This suggests the impact of the dosage of the intervention as mediating outcomes data for participants. Weaver et al. (2015) also raised many of the same methodological limitations as the previous reviews, adding to the calls for future high-quality research in this field.

Khalsa and Butzer (2016) further contributed to the field, providing a valuable overview of yoga in school settings. They included 47 studies within their review, including both quantitative and qualitative research methodologies. In addition to providing further evidence for the positive effects observed by previous systematic reviews (Ferreira-Vorkapic et al., 2015; Serwacki & Cook-Cottone, 2012), Khalsa and Butzer (2016) further demonstrated positive outcomes of yoga for children and adolescents. This included on measures of wellbeing, such as happiness and relaxation (Dai et al., 2015), self-esteem and self-adjustment (Bhardwaj et al., 2015; Sethi et al.,

2013; Telles et al., 2013), mood (Felver et al., 2015), emotional and self-regulation (Bergen-Cico et al., 2015; Daly et al., 2015; Razza et al., 2015), anxiety (Bothe et al., 2014; Frank et al., 2014; Noggle et al., 2012; Parker et al., 2014), depression (Frank et al., 2014) and overall wellbeing (Chen & Pauwels, 2014). They also described benefits for children and adolescents' working memory (Quach et al., 2016) and self-control (Parker et al., 2014; Ramadoss & Bose, 2010). Examining the evidence base suggests positive findings relating to the usefulness of yoga in schools, however Khalsa and Butzer (2016) noted that most studies relied on self-report questionnaires, which provide a limited, and potentially biased, view of outcomes. Moreover, only approximately half of the studies included employed an RCT design. The researchers noted that these limitations may not be surprising given the field is relatively new; however, they also were encouraged that only nine out of the 43 quantitative studies adopted uncontrolled designs.

More recently, James-Palmer et al. (2020) conducted a systematic review exploring the effect of yoga on symptoms of depression and anxiety for children and adolescents. This was not dependent on a clinical diagnosis of depression of anxiety, and instead included all studies that included outcome measures of anxiety and/or depression; thus, the findings are relevant to non-clinical samples of children and adolescents. Within the review, 27 studies were included; 70% of these demonstrated some level of improvement on anxiety and/or depression related symptoms, suggestive of positive effects of yoga. However, James-Palmer et al. (2020) concluded that the methodological quality of the studies was weak to moderate, citing lack of randomisation, no blinding of conditions, and limited analyses of the data. This highlights that approximately a decade after the first systematic review, James-Palmer et al. (2020) came to the same conclusions as previous research in terms of the methodological quality. This suggests that there had

been limited improvement in the quality of studies being published (Birdee et al., 2009; Kaley-Isley et al., 2010; Khalsa & Butzer, 2016).

In the same year, Miller et al. (2020) published another systematic review examining 39 studies, focusing on RCTs of yoga for children and adolescents. Nearly half of all studies reviewed were conducted in the US (47%) and 41% were carried out in India. The remainder of the sample came from Australia, Korea, Haiti, Columbia, and the Netherlands. Miller et al. (2020) observed that 87% of the studies reported a positive effect of yoga on psychological, behavioural, cognitive and/or physical outcomes. Echoing the findings of Khalsa and Butzer's (2016) review, there were found to be benefits for children and adolescents psychological functioning (Bergen-Cico et al., 2015; Bhardwaj & Agrawal, 2013; Daly et al., 2015; Fishbein et al., 2016; Frank et al., 2014, 2017; Jensen & Kenny, 2004; Khalsa et al., 2012; Mendelson et al., 2010; Noggle et al., 2012; Velásquez et al., 2015; White, 2012) and cognitive skills (Purohit & Pradhan, 2017; Quach et al., 2016; Rao & Sarokte, 2013; Verma et al., 2014). However, they also noted two studies that demonstrated negative results for the yoga group (also highlighted in previous systematic reviews; Haden et al., 2014; Telles et al., 2013), including lower self-esteem and increases in negative affect. This systematic review is particularly noteworthy as it only included RCTs, the "gold standard to test effects" (Miller et al., 2020, p. 1348). The number of studies included in the review emphasises the increase in yoga-based RCTs in recent years. Moreover, demonstrates efforts within the research community to employ the randomised designs and control groups recommended to increase the quality of the evidence base. However, Miller et al. (2020) raised concerns over implementation fidelity and urged future studies to monitor and report on fidelity measures to better contextualise the effectiveness (or ineffectiveness) of yoga interventions.

Taken together, it can be concluded that the results for yoga interventions with children and young people are promising. Still, all researchers have called for additional

high-quality research to provide further support for the effectiveness of yoga with children and adolescents. Moreover, within these reviews, it was evident that the US was leading the way in terms of yoga research with children and adolescents. Indeed, the majority of reviews did not include any studies from the UK (Ferreira-Vorkapic et al., 2015; James-Palmer et al., 2020; Kaley-Isley et al., 2010; Khalsa & Butzer, 2016; Miller et al., 2020; Weaver et al., 2015), whilst a single review included one UK-based study (Serwacki & Cook-Cottone, 2012). However, this one UK-based study was based on an intervention that involved multiple components; yoga, massage, and relaxation (Powell et al., 2008). Nevertheless, it does suggest that mind-body interventions are appropriate with UK-based pupils and have the potential to facilitate positive changes. Therefore, there is a timely need for additional UK based evidence.

2.3.2.2 Qualitative Evidence. In addition to the quantitative evidence base, qualitative research has also been increasingly conducted with children and adolescents to explore their perceptions of yoga interventions and the perceived benefits. Qualitative research has added value to elucidate how any benefits may be learned, internalised, and sustained. This may contribute a more nuanced perspective to help shed light on the mixed quantitative evidence. Moreover, this learning has the potential to inform the practical implementation of wellbeing interventions and contribute to the theoretical mechanisms of change that underlie yoga-based interventions. To date, a qualitative thematic synthesis of the evidence base has not yet been conducted; therefore, an overview of relevant studies is provided.

Case-Smith et al. (2010) explored the attitudes and perceptions of 21 children of an 8-week school-based yoga programme. The qualitative data indicated that children perceived yoga to help them feel calm and focused, helped them regulate and control their behaviour through the learning of various stress-management strategies, and supported a more positive self-concept through self-affirmation, which positively impacted upon their

interpersonal relationships. These findings suggest that yoga interventions positively impact the lives of children, helping them to manage their behaviour both within and outside of the classroom.

Conboy et al. (2013) expanded the qualitative evidence, contributing the first known qualitative exploration of a school-based yoga intervention in a secondary school. The researchers interviewed 28 adolescents, revealing individual and social benefits after participation in a 12-week yoga intervention. Adolescents described benefits for their mental health, emotional regulation, sleep, stress management, academic performance, bodily awareness, and athletic performance. Additionally, participants cited social and interpersonal benefits, where they felt that yoga deepened their existing relationships and facilitated a sense of community or cohesion in their friendship groups. In addition to highlighting the range of benefits experienced by adolescents, this research also pointed to the many aspects of yoga classes that participants enjoyed, highlighting the acceptability of these interventions with this population. Indeed, participants enjoyed and valued physical asana and breathing practices, seeing these as integral to their experiences and the benefits they experienced.

Building upon Case-Smith et al. (2010) and Conboy's et al. (2013) research, which were both conducted in a single school, Wang and Hagins (2015) conducted research across multiple schools. They reported on six focus groups conducted with middle and high school students who participated in a school-based yoga intervention. A range of physical and mental health benefits were highlighted, including overall physical health, energy levels, increased athletic performance, self-regulation, mindfulness, reductions in stress, and increases in self-esteem. Building on research spanning multiple settings, Dariotis et al. (2016) triangulated qualitative data from both teachers and adolescents involved in school-based mindful yoga sessions across three schools. Participants noted increases in their emotional appraisal and self-regulation skills after mindful yoga, which

enhanced feelings of calmness and reduced stress. Participants in this study also described how mindful yoga positively impacted their impulse control, which reduced negative behavioural reactions and interpersonal disputes. Similarly, breathing exercises were cited as supporting participants to shift their attention inward and/or redirect their attention away from focusing on external stressors. These findings suggest positive effects on both wellbeing and cognitive skills, echoing findings from the quantitative literature.

Similar benefits were also observed by Butzer et al. (2017), who carried out interviews highlighting a range of direct effects of the yoga intervention for the mental health of participants. These included increases in relaxation and calmness, self-regulation of emotions and behaviours, sleep, a positive impact on mood, and improvements in their social interactions. The researchers also noted improvements in academic performance, suggestive of improvements in self-regulation and attentional control. Similar to Dariotis, Cluxton-Keller, et al. (2016), participants specifically highlighted the breathing exercises as central to these improvements.

This broad range of benefits points to the multi-faceted nature of yoga and the variability in personal benefits that it can foster. Moreover, the findings revealed that children and adolescents could transfer the benefits of yoga into their everyday lives and were not constrained to the classroom. This impact on real-life was echoed across the qualitative field (Butzer, LoRusso, Windsor, et al., 2017; Case-Smith et al., 2010; Conboy et al., 2013; Dariotis, Mirabal-Beltran, et al., 2016; Wang & Hagins, 2015). Despite differences in participant ages and demographics, and differences across yoga programmes (type and dosage), all studies described similar benefits for children and adolescents.

However, qualitative data has also shed light on some of the challenges of practicing yoga, both on a personal basis and at a school-level. Relating to personal

challenges, some children described that yoga was hard to do, the asana were too difficult, or that they did not enjoy it; all of which hindered participation (Dai et al., 2015). On a school-based level, participants have expressed negative feelings towards participating in yoga as their physical education (PE) lesson and were envious of peers who participated in active sports instead. Therefore, adolescents who enjoyed the active nature of PE generally held less positive views of yoga intervention classes (Butzer, LoRusso, Windsor, et al., 2017; Conboy et al., 2013).

Taking the qualitative evidence as a whole, it largely echoes the findings of the quantitative literature, highlighting the positive impacts of yoga interventions for children and adolescents. It deepens and extends the quantitative findings, shedding further light on the range of benefits and also how these benefits may be internalised, learned, and used in different contexts. Whilst promising, it should be noted that the qualitative research to date has been conducted exclusively in the US, where the educational system and adolescents' views and perceptions may be different to the UK. Subsequently, further study in the UK is warranted to understand acceptability and impact for British pupils.

2.4 Mindfulness Interventions

2.4.1 Overview of Mindfulness and Mechanisms of Change

Mindfulness meditation is defined as a non-judgemental, non-elaborative awareness of the present moment that allows for acknowledgement and acceptance of feelings, thoughts, and sensations as and when they arise (Bishop et al., 2004). The concept of mindfulness originated from Buddhist traditions and is believed to lead individuals towards enlightenment, alleviate suffering, and increase wellbeing (Crane, 2009). Although mindfulness has religious underpinnings, its supporters maintain that it is an inherent human capacity, which should not be considered exclusive to the religious (Kabat-Zinn, 2003). Over recent years, mindfulness has been portrayed as more secular, which has made the practice more accessible to Western cultures (Brown & Ryan, 2003).

Jon Kabat-Zinn is one of the mindfulness pioneers that has made mindfulness more accessible to secular audiences. His development of the Mindfulness Based Stress Reduction programme (MBSR; Kabat-Zinn, 1982) helped bring mindfulness to the forefront of psychological research and pain treatment. Early research into MBSR focused on pain as a primary outcomes measure with positive results (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth & Burney, 1985; Kabat-Zinn, Lipworth, Burney & Sellers, 1986). Since then, MBSR programmes have been utilised in various clinical settings, including for mental health issues (Baer, 2003). Furthermore, mindfulness has been reformed into a therapy-based intervention; Mindfulness Based Cognitive Therapy (MBCT), which was specifically designed for individuals with depression (Segal, Williams, Teasdale, & Gemar, 2002). Similar to MBSR, this also attracted favourable results in terms of relapse rates and shifting cognitive styles away from thinking patterns and rumination associated with depression (Barnhofer et al., 2009; Teasdale et al., 2000; Williams, Teasdale, Segal, & Soulsby, 2000).

Based on the theories surrounding MBSR and MBCT, mindfulness is thought to operate through a series of stages in order to initiate change for individuals (Segal et al., 2002). Firstly, mindfulness enables individuals to recognise inefficient or dysfunctional cognitive processes and, secondly, teaches them to disengage from these negative processes through the redirection of attention to the present moment. Thirdly, mindfulness helps individuals to develop a level of meta-awareness and acknowledge that their thoughts and feelings are temporary. Lastly, mindfulness practice aims to relate these changes in thinking and awareness to encourage a non-judgemental and compassionate attitude towards individuals thoughts (Segal et al., 2002).

This is consistent with Shapiro, Carlson, Astin, and Freedman's (2006) Intention, Attention, and Attitude (IAA) theory of mindfulness, which suggests that intentionally paying attention with a non-judgemental attitude leads to a change in perspective. The

first axiom of intention, i.e., why one is practicing mindfulness, sets the scene for the benefits that one might achieve. Indeed, outcomes were found to correlate with intentions (Shapiro, 1992). Therefore, expectations and intentions may be critical in the benefits that participants may achieve. The second axiom, attention, involves attending to both internal and external experiences. This has been shown to be important within cognitive-behavioural therapy, which is largely based on the capacity to observe (and therefore change) patterns of emotions and behaviours (Shapiro et al., 2006), encouraging self-regulation. Lastly, the third axiom of attitude relates to how one attends to the present moment. The traits of non-judgement, acceptance, kindness, and openness are critical within mindfulness practice, which may otherwise result in cultivating patterns of judgement (Shapiro et al., 2006). It has been proposed that engaging these three axioms leads to a shift in perspective; a term coined 'reperceiving', a meta-mechanism of action that leads to positive changes in self-regulation and cognitive, emotional, and behavioural flexibility. Indeed, developing the ability to stand back and continually re-direct attention to the present increases the "degrees of separation" (Shapiro et al., 2006, p. 380) between individuals and their response to emotions. This increases the likelihood of a more adaptive range of coping skills in response to challenging emotions or and situations (Brown & Ryan, 2003).

Shapiro et al.'s (2006) theory is also consistent with Bishop et al.'s (2004) dual-factor operationalised model of mindfulness, which focuses on self-regulation of attention and a change in attitude towards experiences. Firstly, this model theorises that the re-direction of attention to the present moment helps to regulate attention, increasing awareness of emotions, thoughts, feelings, and sensations (Bishop et al., 2004). This has benefits for both sustained attention and attention switching. Moreover, this re-direction reduces opportunities for rumination (instead, focusing back on the present moment) and inhibits secondary elaborative processing of emotions, thoughts, and feelings. As

suggested by Shaprio et al. (2006), it is thought that this leads to the adoption of more adaptive coping skills and improves self-regulation. Secondly, the attitude or orientation to experience is fundamental (Bishop et al., 2004); similar to Shapiro et al.'s (2006) intention axiom. Participants are encouraged to adopt an approach of acceptance and openness to all thoughts, feelings, and emotions, where each is worth noticing. This approach is hypothesised to promote a reduction in cognitive and behavioural strategies to avoid aspects of (negative) experiences and, ultimately, foster resilience to unpleasant stimuli (Bishop et al., 2004). This dual-factor model has received empirical support, showing the advantages of mindfulness for both mental health and wellbeing and executive functioning skills (Bishop et al., 2004).

2.4.2 The Impact of Mindfulness for Children and Adolescents

It has been reported that mindfulness research, as whole, is one of the fastest growing research areas within psychology (Shonin et al., 2013). Given the potential benefits of mindfulness from the adult literature in terms of reducing mental health issues and increasing cognitive functioning, research has turned to the potential of such interventions for children and adolescents.

2.4.2.1 Quantitative Evidence. Similar to the systematic reviews and meta-analyses published in the yoga literature, it was approximately a decade ago when the first reviews were available for the mindfulness field. Interestingly, there are considerable similarities between the yoga and mindfulness fields, where reviews have generally found less positive outcomes in comparison to individual studies. Mindfulness reviews also offered similar commentary on the methodological limitations and the necessary progress required within the field to progress the evidence base further. An overview of the meta-analyses and systematic reviews of mindfulness with children and adolescents is provided below.

Black, Milam, and Sussman (2009) published a review of the efficacy of sitting meditation practices for children and adolescents. The authors reviewed 16 studies, totalling over 860 children and adolescents across school, community, and clinical settings, with the data generally biased towards children and adolescents with pre-existing conditions. This review observed medium effect sizes for sitting meditation on physiological, psychological, and behavioural outcomes for children and adolescents. However, it was noted that these effect sizes were notably smaller than found amongst the adult literature (Grossman et al., 2004). Around the same time, another review was published, which reported on 15 peer-reviewed mindfulness articles, with the majority carried out with clinical populations (Burke, 2010). Although the review found strong support for the feasibility of these interventions with younger populations, there was a lack of empirical evidence for the efficacy of mindfulness interventions, largely due to methodological weaknesses and inconsistencies. Both reviews reached similar conclusions and noted that the evidence behind mindfulness with children and adolescents was generally limited by design factors, most likely attributable to the early stages of these research areas. Both researchers urged future research to be more rigorous in its methodology to allow more robust conclusions to be drawn.

Whilst not exclusively looking at research conducted within schools, Zoogman et al. (2015) observed that most mindfulness studies included in their 20 eligible studies for review were located within the school environments. Thus, in the five years since the publication of the previous reviews, there had been an increase in the available literature signalling the growth in the field. When looking only at mental health improvements, the researchers found similar positive results and concluded that mindfulness was more effective than a non-active control. These findings were also similar to another meta-analysis conducted at a similar time, which highlighted positive outcomes for stress,

anxiety, and quality of life for clinical and non-clinical samples (Kallapiran et al., 2015)[7]. However, when Zoogman et al. (2015) compared clinical and non-clinical populations, they found that mindfulness may be particularly beneficial with clinical groups for reductions in mental health problems. These benefits for clinical groups have been widely documented in more recent systematic reviews, including for children and adolescents diagnosed with mental health problems (Kostova et al., 2019), including anxiety (Borquist-Conlon et al., 2019), depression (Chi et al., 2018; Klainin-Yobas et al., 2012; Reangsing et al., 2021), and those with special educational needs (Klingbeil, Fischer, et al., 2017).

Despite the apparent heightened benefit for clinical samples, systematic reviews and meta-analyses have also emphasised benefits for non-clinical samples of children and adolescents across various outcome measures. Klingbeil et al. (2017) included 76 studies of mindfulness interventions with children and adolescents; a considerably higher number of studies than previous reviews. They concluded that there were small positive effects for pre-post and controlled designs across various psychological outcomes measures, particularly when research studies employed follow-up periods. When looking at empathy and self-compassion outcomes, Cheang et al. (2019) reviewed 16 studies to find "convincing support" (p. 1774) in favour of increases in empathy and compassion following participation in mindfulness interventions. For anxiety outcomes, Odgers et al. (2020) found a small significant effect of mindfulness interventions on children and adolescent's anxiety, when taking all 20 studies eligible for inclusion into account. However, these results were moderated by location, where large effect sizes were found in Iran, but non-significant effects found within Western Cultures. There were also age-related differences, with comparisons for younger age groups demonstrating significant differences between intervention and control group, however these differences were non-

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[7] Kallapiran et al. (2015) also included studies of yoga and Acceptance Commitment Therapy and did not focus exclusively on mindfulness interventions.

significant within adolescent samples. Similarly, Ruiz-Íñiguez et al. (2020) did not find an overall effect of mindfulness on measures of anxiety for children and adolescents across the 18 studies reviewed. Indeed, only three of the 18 studies found significant improvements on outcome measures (Napoli et al., 2005; Parker et al., 2014; Sibinga et al., 2013). These findings were also similar to a systematic review conducted by Mak et al. (2017), who found that only five of the 13 studies included demonstrated a significant effect on attention and executive function. Therefore, there are nuanced findings within the mindfulness literature that require further exploration.

Dunning et al. (2019) sought to explore, in detail, some of these complexities and inconsistences in their meta-analysis of RCTs of mindfulness interventions for children and adolescents' mental health and wellbeing. When all 34 eligible studies were taken together, mindfulness interventions led to improvements in measures of mindfulness, executive functions, and attention, which may be associated with downstream improvements in wellbeing, consistent with the theories of mindfulness (Bishop et al., 2004; Shapiro et al., 2006). However, it was noted that effect sizes were smaller than reported elsewhere (Klingbeil, Renshaw, et al., 2017; Maynard et al., 2017; Zenner et al., 2014; Zoogman et al., 2015), likely due to the inclusion criteria of the study adopting a more rigorous RCT design. However, Dunning et al. (2019) also emphasised the moderating factor of age within the pattern of findings. It was found that mindfulness interventions were more effective with older cohorts of adolescents, in comparison to younger cohorts. The age period of 14-18 years was optimal, possibly due to heightened brain plasticity in this stage (Giedd, 2008). Dunning et al. (2019) also highlighted variation in outcomes based on the dosage of interventions, with more training associated with more favourable outcome measures. Thus, this meta-analysis highlights many of the mediating factors that may contribute to the conflicting findings within the mindfulness field with children and adolescents. However, they did also emphasise the paucity of

RCTs within the field and called for further high-quality methods to contribute to this growing field.

In addition to research that conflated studies across different settings, a growing body of research has specifically explored the impact of school-based mindfulness interventions. Zenner et al. (2014) conducted the first systematic review and meta-analysis into school-based mindfulness. Within this review, 24 studies were identified, which delivered mindfulness training to over 1300 students. Zenner et al.'s (2014) meta-analysis reported an overall medium effect size of mindfulness training for children and adolescents, across all controlled studies and domains. The strongest effect sizes were found for cognitive measures, whilst smaller, yet still significant, effect sizes were found for resilience and stress. There were also non-significant improvements for emotional problems. Therefore, it could be concluded that mindfulness interventions in schools positively affect the cognitive functioning of children and adolescents, with possible secondary benefits for psychological functioning. This meta-analysis is particularly noteworthy as it also included unpublished grey literature, contributing a previously unknown section of the field. Moreover, it focused on school-based interventions within the community, suggesting benefits for the general population, in contrast to clinical populations. Despite these strengths, Zenner et al. (2014) highlighted limitations within the field, including a need for larger studies with longer follow up periods, similar to that recommended within the yoga field. They also recommended the adoption of mixed methods approaches to capture outcomes and issues regarding implementation to better understand the context in which interventions are delivered, especially within schools.

Building upon Zenner et al.'s (2014) review of school-based literature only, other researchers have also adopted this approach (Carsley et al., 2018; Felver et al., 2016; Maynard et al., 2017; McKeering & Hwang, 2019; Segal et al., 2021). Carsley et al. (2018) included 24 studies in their meta-analysis to find small to moderate significant

effects of mindfulness interventions on measures of mental health and wellbeing in comparison to control groups. Similar to other reviews, there were age-related effects, with mindfulness interventions delivered within late adolescence being most beneficial (Dunning et al., 2019). In contrast, a systematic review of mindfulness interventions for early adolescents (11–14-year-olds) found positive improvements on wellbeing measures in eleven of the 13 papers reviewed. Thus, this suggests that there may be preventative value of mindfulness interventions, however there is a discrepancy over the optimal age of delivery.

Despite potential age-related mediating factors, other researchers have also pointed to the positive effects of school-based mindfulness interventions. Indeed, Felver et al. (2016) reviewed 28 studies to find increases in prosocial psychosocial attributes, emotional regulation, social skills, coping positive affect, optimism, and classroom behaviours. This was alongside decreases in behavioural problems, anxiety, depression, and attention-related difficulties. Thus, Felver et al. (2016) suggested that mindfulness interventions delivered in schools showed "great potential" (p. 40) for improving children and adolescents' outcomes. In the largest review, Maynard et al. (2017) sought to synthesise evidence relating to the cognitive, psychological, academic, and behaviour related benefits of mindfulness interventions in school settings. 61 studies were included within their systematic review, which suggested small significant effects on cognitive and socioemotional outcomes and small non-significant effects on academic and behavioural outcomes. Therefore, despite the diversity in mindfulness programmes employed between schools, there were similar positive impacts for participants when interventions were delivered within the school context. However, all studies were aligned in their critique of the current evidence base requiring more RCT studies, active control groups, and increased reporting of school and population characteristics. Moreover, Maynard et al. (2017) criticised the subjectivity of the authors, who often had some allegiance to the

intervention being tested; they may be involved in the design, development, or implementation of the intervention. Thus, future research should be conducted by more objective parties without a vested interest in the intervention.

In addition to demonstrating the utility of mindfulness interventions within schools generally, a recent systematic review has specifically explored the impact within low-income schools, where children and adolescents may face additional stressors (Reiss, 2013). Segal et al. (2021) included eight studies within the systematic review, all of which were conducted in the US. Across the studies, it was found that in comparison to a control group, there were improvements in externalizing symptoms (Fung et al., 2016, 2019; Klatt et al., 2013), internalizing symptoms (Fung et al., 2019; Sibinga et al., 2013, 2016), and emotional regulation (Fung et al., 2019; Mendelson et al., 2015; Sibinga et al., 2016) after participating in a yoga intervention. Subsequently, the researchers urged additional research focusing on this vulnerable population to further elucidate the impact of mindfulness for those living in low SES areas.

A consistent finding across the studies reviewed was the location of the majority of mindfulness literature being conducted in the US. However, there is one notable exception within the UK. Some of this research has been included within the existing reviews, however, it is worth highlighting given the UK-based school content of the current thesis. The Mindfulness in Schools Project's (MiSP) .b (dot-be; Stop, Breathe and Be) programme has attracted increasing research attention. Huppert and Johnson (2010) conducted a pilot evaluation of the earliest version of .b with 173 adolescent boys. The findings revealed significant improvements on mindfulness, resilience, and wellbeing measures for those students who took part in the intervention group and continued this practice at home, but smaller, non-significant changes for those who did not partake in home practice. However, this research was limited by its homogeneous sample of white, middle class, privately educated males. Despite this sample limitation, this study revealed

that mindfulness was acceptable to adolescents in the UK and warranted further enquiry. A number of doctoral theses have further validated .b in the UK. Hennelly (2011) explored the effects of the .b programme in a mixed-gender secondary school to find significant improvements on measures of resilience and wellbeing. Kempson (2013) also revealed that pupils felt the .b programme was helpful to them in their lives, specifically for staying calm and relaxing, and for use as a coping strategy outside of the mindfulness lessons.

Since the initial pilot evaluation, the .b programme has expanded to more sessions and has been further validated with a larger and more diverse sample of adolescents. Kuyken et al. (2013) conducted a non-RCT with 522 12-16 years olds across twelve schools in the UK to explore the impact of the .b intervention. It was found that the intervention was acceptable to adolescents across different school contexts. Moreover, the intervention reduced depressive symptoms and stress and increased overall wellbeing (Kuyken et al., 2013). This study is particularly noteworthy as it adopted a universal approach to delivery implemented into the school curriculum. Nevertheless, within the pool of schools, half were still fee-paying, which may not reflect the wider school context in the UK. Similarly, it was not representative in terms of ethnicity or gender, where the majority of participants were white males (Kuyken et al., 2013). In order to add to the UK-based research further, the Oxford Mindfulness Centre is currently conducting a large-scale quantitative cluster-RCT to establish the effectiveness and cost-effectiveness of school-based mindfulness interventions in the UK (Kuyken et al., 2017; Montero-Marin et al., 2021). Nevertheless, at the time of writing, no results have been published.

2.4.2.2 Qualitative Evidence. Qualitative research has shadowed the increase in quantitative mindfulness-based literature. Several studies have been conducted in recent years to give a voice to the experiences of participants and shed light on some of the mechanisms behind the internalisation of benefits. Unlike the yoga field, researchers have

conducted a thematic synthesis of mindfulness interventions for children and adolescents, drawing together the findings from qualitative studies. Sapthiang et al. (2019) sought out to contribute a high-level perspective of the existing qualitative evidence, summarising the views of children and adolescents about the first-hand impacts of school-based mindfulness interventions. This moves away from conducting research 'on' children and adolescents and puts their views and experiences at the centre of this body of research (Bannirchelvam et al., 2017).

In drawing together the qualitative findings from seven studies (Bannirchelvam et al., 2017; Costello & Lawler, 2014; Dariotis et al., 2017; Dariotis, Mirabal-Beltran, et al., 2016; McGeechan et al., 2019; Milligan et al., 2017; Tunney et al., 2017)[8], Sapthiang et al. (2019) identified four overarching themes of the benefits described by approximately 250 children and adolescents. Firstly, the researchers observed that mindfulness supported increased awareness of emotions and cognitive processes, which were helpful for attentional processes and self-regulation. Secondly, participants described decreases in stress and the usefulness of mindfulness techniques in helping to manage and combat stressful situations. Thirdly, adolescents discussed improvements in their coping skills, which helped to support positive social skills and interactions. Fourthly, participants reflected on the benefits to their state of relaxation and calmness, facilitated by mindfulness practices. Therefore, the benefits identified across studies were reminiscent of the wellbeing and cognitive-related benefits identified in the quantitative literature. Moreover, they were also similar to the benefits reported within the yoga literature, suggesting similar benefits from both mind-body interventions.

Of particular interest and relevance, one of the studies included in Sapthiang et al.'s (2019) thematic synthesis was carried out in the UK. McGeechan et al. (2019) conducted qualitative interviews with 16 adolescents who had participated in the .b ten

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[8] There is some cross over with the yoga qualitative literature in two studies (Dariotis et al., 2017; Dariotis, Mirabal-Beltran, et al., 2016) as they reported on a mindful yoga intervention.

week mindfulness intervention in England. Consistent with the overarching themes, participants in this study described reductions in stress and improved coping skills. This is particularly noteworthy, as adolescents in the UK described benefits consistent with US-based studies, suggesting similar perceptions of benefits and usefulness internationally.

Whilst not an aim of the thematic synthesis (Sapthiang et al., 2019), a minority of these studies reported some challenges to mindfulness for their participants. As in the yoga literature, these are useful to better understand barriers to practice. Barriers included limited knowledge of what mindfulness was prior to participation (Bannirchelvam et al., 2017; McGeechan et al., 2019), misconceptions about what it is or what it may help with (Bannirchelvam et al., 2017), and feeling obligated or forced to participate in the interventions (Dariotis et al., 2017; McGeechan et al., 2019).

Since the publication of Sapthiang et al.'s (2019) synthesis, a more recent qualitative study has extended the evidence base further, focusing on at-risk children and adolescents attending low-income school in Chile (Andreu et al., 2021). The findings indicated that participants saw benefits for increasing their self-awareness, relaxation, ability to link emotions and behaviours, and self-regulation. They also described improvements in impulsivity and reactiveness, positively impacting anger and aggressive behaviours. Benefits across these domains were felt to improve the culture within school and at home, suggesting wider benefits for people who did not participate in the interventions (e.g., parents and siblings). Considering these benefits, the researchers concluded that mindfulness interventions were acceptable to and beneficial for children and adolescents attending low-resource schools. In contrast to the US-focused evidence base, this study further demonstrates the utility of mindfulness interventions beyond American culture.

2.5 Implementation of School-Based Wellbeing Interventions

Research to date has pointed to positive effects of yoga and mindfulness interventions for children and adolescents, however research has recommended a more in-depth focus on implementation factors that may contextualise any benefits. Moreover, the degree to which interventions are delivered as intended has been associated with participant outcomes. Indeed, high fidelity has been associated with more positive participant outcomes in preventative interventions for children and adolescents (Durlak & DuPre, 2008). Similarly, Durlak et al. (2011) concluded that implementation issues moderated programme outcomes for universal school-based interventions. Such examples indicate the importance of exploring implementation factors, especially in complex school settings, given the potential impact on outcomes. Subsequently, there has been recent qualitative interest in exploring factors that may affect the implementation and delivery of mind-body interventions within school settings. Dariotis et al. (2008) proposed a model to describe the various factors that may impact upon the success of intervention implementation and delivery (Figure 2).

Figure 2.

Implementation System Model.

Implementer
- Buy in
- Motivation
- Time
- Prioritisation

Programme
- Quality of materials
- Flexibility to adapt
- Time
- Cost
- Quality of training

Recipient
- Target group
- Recruitment
- Responsivity and engagement

Implementation Organisation
- Staff buy in
- Cohesiveness and collaboration
- Programme 'champions'
- Financial support

Programme Adherence

School / Community
- Collaboration
- Communication with parents
- Community leader support
- Parental support

Note. Adapted from Dariotis et al. (2008, p. 748).

Consistent with this model, research has repeatedly highlighted staff buy-in as a key factor in intervention implementation and delivery (Dariotis et al., 2008, 2017; Durlak, 2016; Forman et al., 2009; Hudson et al., 2020; Joyce et al., 2010; Langley et al., 2010; McKeering & Hwang, 2019; Mendelson et al., 2014; Sibinga et al., 2016; Wilde et al., 2019). Buy-in was cited as integral for indicating that the school was committed to delivering mind-body interventions and valued them as a part of the school ethos (Mendelson et al., 2014). Staff buy-in needed to be achieved from every level of stakeholders; from management and/or leadership, schoolteachers, administrative staff, and external partners. However, buy-in from leadership was particularly important for facilitating the implementation of school-based health interventions, likely due to their decision-making and funding allocation responsibilities (Hudson et al., 2020; Langley et al., 2010; Sibinga et al., 2016; Todd et al., 2015; Wilde et al., 2019). They also influenced

the relative priority of the interventions within the school and could protect the interventions if competing priorities arose (Hudson et al., 2020; Langley et al., 2010).

When considering staff buy-in, this also includes a commitment from the intervention facilitator; a key influential figure in the delivery of wellbeing interventions. The intervention facilitator's knowledge, skills, and qualities play a significant role in the success (or otherwise) of mind-body interventions (Dariotis et al., 2008). Subsequently, the competencies, training, and personal qualities of the facilitators were integral in intervention delivery. The importance of these competencies is consistent with the Pro-Social Classroom Model (Jennings & Greenberg, 2009), which suggests the importance of these on experiences of wellbeing interventions and, ultimately, student outcomes (see Chapter 7, Section 7.3.2 for a more comprehensive overview). Qualities that children and adolescents valued included respect, care, fairness, and the use of alternative behaviour management strategies, as opposed to shouting (Dariotis et al., 2017).

In addition to their interactions with adolescents, intervention facilitators also affected intervention implementation through communication with school staff and other professionals (Dariotis et al., 2017; Hudson et al., 2020; Mendelson et al., 2014). Successful implementation was associated with strong communication between intervention facilitators and school staff about the aims and goals of the sessions, programme logistics, and student attendance and behaviour (Dariotis et al., 2017). This helped staff to address any issues promptly, with limited impact upon intervention delivery (Mendelson et al., 2014). In contrast, a lack of communication opportunities between and within staff groups hindered implementation (Hudson et al., 2020). Therefore, buy-in and communication between staff was integral for intervention implementation and ongoing delivery.

Furthermore, buy-in from programme participants was important for implementation and delivery. The children and adolescents participating need to be open

and willing to participate in mind-body interventions in the school context. Research has highlighted that within-curriculum sessions were preferred by pupils, which did not require additional time from them, such as after-school or lunch-time activities (Mendelson et al., 2014). However, even if interventions were held in lesson time, some pupils were less willing to engage if mind-body interventions prevented them from engaging in other lessons that they enjoyed (Butzer, LoRusso, Windsor, et al., 2017; Conboy et al., 2013; Dariotis et al., 2017; Mendelson et al., 2014). For instance, pupils who enjoyed active team-based sports in PE lessons were less positive about mind-body classes (Conboy et al., 2013).

There were also key logistical and space related considerations that were necessary for implementation. Whilst research has shown that children and adolescents prefer interventions delivered within curriculum time (Mendelson et al., 2014), schools faced challenges in finding time within the curriculum, given their overarching focus on attainment targets (Langley et al., 2010). Moreover, finding spaces large enough to deliver these classes could be challenging (Langley et al., 2010). Mendelson et al. (2014) described urban schools in particular as space-poor, reflecting challenges around finding rooms. Not only were there challenges in finding rooms, but finding appropriate rooms was even more difficult. Indeed, mind-body interventions require a different set-up to usual classrooms, considering the focus on self-reflection and meditation (Arthurson, 2015; Joyce et al., 2010). Therefore, when classes were hosted in less than optimal spaces, these could be distracting for children and adolescents who coveted larger, quieter, and more relaxing spaces (Dariotis et al., 2017).

Consistent with the implementation systems model proposed by Dariotis et al. (2008), various factors have been shown to affect the implementation and delivery of mind-body interventions in schools. These include community, organisational, implementer, programme, and participant factors, which influence intervention

programme adherence. Considering the myriad of factors that may affect implementation and considering the impact of adherence on participant outcomes (Durlak et al., 2011; Durlak & DuPre, 2008), it is necessary to include exploration of these factors in future mind-body intervention research, as recommended by Zenner et al. (2014).

2.6 Adverse Effects of Yoga and Mindfulness

Despite the positive impact of yoga and mindfulness on a range of psychological and cognitive measures, there is some concern that mind-body interventions may adversely affect some individuals and may not be suitable for all. Both interventions are designed to bring experiences and feelings into present awareness; negative thoughts and experiences are likely to arise as they are a normal part of human experience. However, increasing awareness may increase feelings of inadequacy and increase feelings of depression and anxiety (Kaley-Isley et al., 2010). Therefore, several precautions must be considered, namely the intensity of practice, the vulnerability of the participants, and the training of the facilitators. In programmes that have taken these safeguards into consideration, there does not appear to be any evidence of harm (Kuyken et al., 2016)[9]. Where negative effects have been found, these have been explained by negative short-term effects, which lead to long-term positive changes, consistent with the theories of mind-body interventions (Bishop et al., 2004; Shapiro et al., 2006). This is consistent with qualitative research that has highlighted the difficulties or challenges experiences by some participants in mind-body programmes however, for the most part, these difficulties were seen as positive and empowering experiences (Lomas et al., 2015; Malpass et al., 2012).

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[9] Retreat-based meditative programmes, however, have been associated with adverse effects such as depersonalisation, hallucinations, and feelings of detachment from reality Castillo, 1990; Chan-Ob & Boonyanaruthee, 1999; Sethi & Bhargava, 2003; Shapiro, 1992; VanderKooi, 1997; Yorston, 2001). However, these studies were largely case studies of individuals that had experienced adverse effects. Consequently, the results cannot be generalised to situations beyond these individuals or retreat-based settings.

When considering specific vulnerabilities of individuals, there is currently a paucity of research that has examined who may be at risk when practicing mind-body interventions. There is a view that previous mental health problems may make an individual more vulnerable to any adverse effects of practice. Despite this view, research has shown that individuals with mental health problems can safely and effectively engage in mind-body interventions, often with benefits (Borquist-Conlon et al., 2019; Chi et al., 2018; Kaley-Isley et al., 2010; Klainin-Yobas et al., 2012; Kostova et al., 2019). However, this may be related to the stringent inclusion and exclusion criteria within participant selection when working with clinical populations. Similarly, studies may have recruited specifically trained intervention facilitators experienced in supporting individuals with mental health problems, which may mitigate some of the effects that might be seen in vulnerable participants without this support system in place.

In addition to exploring existing vulnerabilities, there is a growing consensus that the quality of the intervention facilitator is crucial for safe practice. Qualitative research has highlighted the methods used by the facilitator, the teaching of an empowering way of dealing with problems, and group processes as key factors in individuals' experiences and enjoyment of mindfulness practices (van Aalderen et al., 2014). Similar to mindfulness practice, yoga practice and enjoyment has also been shown to be influenced by the facilitator, their teaching style, and characteristics (Atkinson & Permuth-Levine, 2009). Considering this, to understand any reasons for the effectiveness of mind-body interventions, research should include measures of facilitators' qualifications and participants' perceptions of the intervention facilitator.

Lastly, it should be considered that understanding of any adverse effects of these interventions may be limited due to publication bias. This is the tendency for researchers to withhold or journals to fail to publish studies with non-significant or adverse results (Joober et al., 2012; Sutton, 2009). This may take the form of study publication bias where

only positive or significant studies are published, selective outcome reporting bias, where outcomes are chosen for inclusion in studies based on statistical significance (with non-significant findings not included), or selective analysis reporting bias, where data is analysed with multiple methods and reported for the positive results only (Coronado-Montoya et al., 2016). This bias towards publishing significant findings may "seriously distort" (Joober et al., 2012, p. 149) the field. Therefore, the risk of publication bias may mask any adverse or non-significant effects, which are less likely to be published.

However, the extent to which the mind-body field is affected by publication bias is debated. Some researchers have suggested that there is no or minimal probability of reporting bias within the mind-body field (Carsley et al., 2018; Zoogman et al., 2015), whilst others have suggested a moderate level of bias (Breedvelt et al., 2019; Dunning et al., 2019; Klingbeil, Renshaw, et al., 2017; Maynard et al., 2017; Zenner et al., 2014). In contrast, other studies have painted a much more influential picture of publication bias significantly affecting the field. Whilst not focused exclusively on children and adolescents, Coronado-Montoya et al. (2016) found that almost 90% of published RCTs exploring the effects of mindfulness interventions reported positive outcomes, which was 1.6 times greater than the expected number if there was no bias. Thus, as a result of possible publication bias, the literature as a whole may overstate the benefits that occur in reality, which, in turn, may limit understanding of any adverse effects.

2.7 Overview of the Literature

Mental health and wellbeing problems in childhood and adolescence are increasing, with harmful consequences for social, emotional, educational, professional, and general life outcomes (Fergusson et al., 2005; Sainsbury Centre for Mental Health, 2009). Despite this, only a minority of children have accessed specialist mental health services, in part due to reluctance from children and adolescents to seek help (Zachrisson et al., 2006), but also due to high access thresholds and long waiting list times for CAMHS

(Children's Commissioner, 2016; Frith, 2017). Consequently, the government has held a spotlight to the child and adolescent mental health agenda, led by the *Future in Mind* report (NHS England and DoH et al., 2015). This report made several recommendations for health and education services and identified schools as unique settings that play a vital role in promoting wellbeing and supporting positive mental health.

The increased attention on schools to support the mental health and wellbeing of pupils has increased demand for effective and cost-effective universal interventions to implement across the curriculum. Two such interventions that schools across the world have begun to implement are yoga and mindfulness. Both yoga and mindfulness have been shown in the research literature to benefit a range of psychological and cognitive measures. Despite positive results being reported in individual studies, meta-analyses have not always supported such favourable results; instead, they have reported smaller effect sizes. Subsequently, researchers have concluded that the evidence base for yoga and mindfulness interventions with children and adolescents is still in its infancy. Indeed, there are a number of methodological weaknesses that need to be addressed before reliable conclusions can be drawn regarding the effectiveness of yoga and mindfulness with children and adolescents (Greenberg & Harris, 2012). One of the major shortcomings of the methodologies employed in the available research lies in the utilisation of small sample sizes, and consequently, the studies are underpowered and may not detect treatment effects (Black et al., 2009; Carsley et al., 2018; Dunning et al., 2019; Miller et al., 2020; Serwacki & Cook-Cottone, 2012; Zenner et al., 2014). There are also few RCTs within the field, and even fewer are deemed high-quality and sufficiently powered (Dunning et al., 2019; Greenberg & Harris, 2012; Serwacki & Cook-Cottone, 2012). Furthermore, Zenner et al. (2014) proposed that the evidence base often missed implementation and contextual factors, fundamental to understanding the delivery of these interventions in practice.

Making advancements in the methodological rigour of studies into the effectiveness of yoga and mindfulness is vital, given the popularity of mindfulness and yoga-based interventions. The research available to date has provided strong support of the feasibility and acceptability of yoga and mindfulness interventions with younger cohorts and in school environments. Meta-analyses have now urged researchers to commit to more empirically sound designs to strengthen and validate the evidence base surrounding these interventions with children and adolescents. To do this, the same standards as with the adult literature must be met. Nevertheless, conducting such rigorous and comprehensive research with children and adolescents is inherently more challenging than conducting research with adults, in terms of implementation, access, and consent (Bonnell et al., 2018; British Psychological Society [BPS], 2018a; Brown, 2019). Despite these challenges, it is important that the evidence base is methodologically sound, consisting of large scale RCTs with sufficient power, across a range of demographically diverse populations (Carsley et al., 2018; Dunning et al., 2019; Greenberg & Harris, 2012; Khalsa & Butzer, 2016; Miller et al., 2020; Zenner et al., 2014).

Zenner et al. (2014) and Khalsa and Butzer (2016) further recommended using mixed methods designs to triangulate quantitative findings with qualitative interviews and objective measures, such as grades, cognitive tasks, or behavioural observations. Moreover, qualitative methods were deemed necessary in elucidating the impact of implementation and contextual factors, which have been shown to influence intervention outcomes (Durlak et al., 2011; Durlak & DuPre, 2008).

2.7.1 Rationale

Considering the methodological limitations prevalent within the field, the current research aimed to build upon the recommendations of recent meta-analyses exploring the effectiveness of yoga and mindfulness interventions with adolescents. More specifically, the current research was designed in line with the recommendations and employed a

cluster RCT design within the school context, with the use of randomization and a control group. In doing so, the current study sought to contribute to the high-quality RCT evidence base for both yoga and mindfulness. To address concerns about implementation issues (Khalsa & Butzer, 2016; Zenner et al., 2014), the RCT was conducted alongside a qualitative process evaluation to elucidate any reasons for effectiveness (or otherwise) of the interventions. Exploring both the impact and implementation contributes a more comprehensive understanding of if and how these interventions may or may not be acceptable and effective within the school context. The current study was relatively unique in the three-arm approach adopted, employing a yoga, mindfulness, and control group. Therefore, the current research explored the acceptability, implementation, and effectiveness of both mind-body interventions in a single setting, allowing for exploration of any differences between these two interventions.

In terms of the sample, the current research sought to explore the acceptability and effectiveness of yoga and mindfulness interventions with a novel and more diverse population than previous research. Until now, the majority of yoga and mindfulness literature has been conducted in the US (Weare, 2012). However, given the cultural differences between the UK and US, the current research engaged a mainstream secondary school in the UK to better understand acceptability and the impact of these in the UK educational system specifically. Within the yoga field, this constitutes a novel population; this is the first known study to explore the impact of school-based yoga with adolescents attending school in the UK. Within the mindfulness field, a small body of literature has explored the impact of mindfulness in UK schools, but this has generally focused on fee-paying schools and/or with targeted or self-selecting groups of adolescents (Huppert & Johnson, 2010; Kuyken et al., 2013). However, the current study utilised a more diverse sample than previous studies, both in terms of SES and the ethnicity of the participants. Indeed, a specific focus on the effectiveness of mind-body interventions in

low SES settings has been emphasised recently (Segal et al., 2021), given the increased likelihood of mental health needs within this population.

Furthermore, the current study adopted a universal approach to intervention delivery, which is in contrast to the majority of the evidence base that has been researched with targeted or self-selecting groups of adolescents (Bannirchelvam et al., 2017; Case-Smith et al., 2010; Conboy et al., 2013; McGeechan et al., 2019; Wall, 2005; Wisner, 2014). As the intervention classes were delivered to entire classes of pupils in the current study (rather than based on a specific need or characteristic), this has been referred to as a universal approach to delivery. As classes were made up of general population schoolchildren (i.e. form classes were not formed based on any tagrted characteristics) this is approach is consistent with the definiton of universal interventions proffered by O'Connor et al. (2018). Therefore, the universal approach adopted within the current study gave all adolescents in the sample population an equal opportunity of participating in the interventions. Consequently, the study explored acceptability and effectiveness with a larger sample, similar to 'real-world' interventions in school. In doing so, the findings from the current research may be more ecologically valid and useful for school-based mental health support.

Consequently, the current research sought to address these methodological, sample, geographical, and implementation gaps within the current yoga and mindfulness evidence base. Considering the recent changes to the PSHE curriculum for UK schools, it is timely to consider the acceptability and effectiveness of yoga and mindfulness to provide learning for UK schools and assist them in finding practical interventions that can support the mental health and wellbeing of their pupils.

2.7.2 Research Questions

To address the gaps in understanding of the acceptability and impact of yoga and mindfulness with a novel and diverse sample in the UK, the current research set out to

address four overarching research questions through a mixed methods approach, encompassing both an impact and process evaluation:

1. What impact do yoga and mindfulness have on adolescents' wellbeing?

2. What impact do yoga and mindfulness have on adolescents' cognitive skills?

3. How do adolescents and professionals perceive the acceptability and use of yoga and mindfulness in schools?

4. How are yoga and mindfulness interventions implemented and delivered in schools; what works and what are the challenges?

3. Approach to Methodology

3.1 Overview of Chapter

This chapter focuses on the characteristics of the research setting, which can be viewed as unique compared to past research for its levels of deprivation and sample characteristics. The chapter also describes the specific yoga and mindfulness interventions delivered within the research; namely the creation of the Yoga4Schools yoga intervention and the use of the MiSP's .b mindfulness intervention. Lastly, the rationale for the mixed methods approach employed in the current study is described, and the distinct phases of the research are outlined to provide an overview of the subsequent chapters.

3.2 Research Setting

In order to locate a school that was willing to integrate yoga and mindfulness interventions into the curriculum, schools were approached through emails advertising the opportunity to participate in a free term of wellbeing classes (Appendix A)[10]. Schools that met the inclusion and exclusion criteria (Table 1) were approached. These inclusion and exclusion criteria were adopted to increase the generalisability of the sample and widen the sample demographics of previous studies. Additionally, practical and pragmatic factors were considered. Conducting research with school settings can be challenging, with multiple competing priorities. To minimise these competing priorities, schools with a minimum of a 'good' Ofsted rating were included within the criteria, as those with a lower rating are subject to more frequent Ofsted reviews (Ofsted, 2019), which may cause additional stressors for school staff (Williams & Gersch, 2004).

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[10] To fund these wellbeing classes, additional project funding was applied for and granted by City, University of London.

Table 1.

Inclusion and Exclusion Criteria for School Recruitment.

Inclusion Criteria	Exclusion Criteria
• Mixed gender • Mainstream school • Secondary school • Minimum of 'Good' Ofsted rating • No/minimal yoga or mindfulness practice • Willingness to put yoga and mindfulness into the curriculum	• Fee-paying • Faith school • Academy, Independent, or Special School

To recruit a school for the current study that met the inclusion and exclusion criteria, emails were sent out to all eligible secondary schools within the vicinity of the University of Westminster. Two schools replied to the initial email and were asked follow-up questions regarding their previous experience with yoga and mindfulness and their willingness to integrate these classes into the curriculum. One school had no previous yoga or mindfulness experience with pupils and was willing to embed these classes into the PSHE curriculum for a term.

Consequently, one London-based mainstream (local authority maintained) secondary school participated in this study and implemented yoga and mindfulness interventions within the school curriculum for Year 8 pupils (12-13-year-olds) for two consecutive years during the Autumn term 2018 and 2019. Year 8 pupils were selected at the discretion of the school, based on a perception that there was a gap in the current support programmes for this specific year group.

3.2.1 Characteristics of the Local Area

Details of the overall school and local area context were taken from official statistics that were publicly available (Gov.uk, 2018; Ministry of Housing, Communities and Local Government, 2015). Based on this data, the area the school was situated in was a highly deprived area in London. The Index of Multiple Deprivation (IMD) represents

the official measure of deprivation, combining information from seven different domains. The domains include income deprivation, unemployment, crime, educational deprivation, housing deprivation, health deprivation/disability, and living environment deprivation to produce an overall measure of deprivation (Department for Communities and Local Government, 2016).

The IMD indicated that the local area surrounding the school was within the top 20% of the most deprived areas in England (Ministry of Housing Communities and Local Government, 2019). When the overall IMD was broken down into the different domains, the local neighbourhood where the school was located was within the top 20% of the most deprived areas in England for low income, unemployment, and crime, and in the top 30% of the most deprived areas for the quality of the local environment. Furthermore, it was within the top 40% of the most deprived areas nationally for measures of education, skills and training, health and disability, and barriers to housing and services (Ministry of Housing Communities and Local Government, 2019).

Additionally, the Income Deprivation Affecting Children Index is a measure that is concerned with the proportion of children aged 0-15 years old who live in income deprived families (Ministry of Housing Communities and Local Government, 2019). This sub-measure, showed that the area was in the top 20% of the most deprived areas for children specifically (Ministry of Housing Communities and Local Government, 2019). When looking at the local authority more generally, this is especially concerning given that children and adolescents (aged 0-15) make up approximately 17% of the population (Ministry of Housing Communities and Local Government, 2019).

Whilst there is no specific threshold for defining a highly deprived area, the IMD compares neighbourhoods, which allows for classification into deciles of deprivation. Therefore, considering the local area in the current research had been classified within

the top 20% of deprived areas nationally, it would be reasonable to conclude that the area was highly deprived across several key variables.

3.2.2 Characteristics of the School Population

In line with the deprivation statistics described, approximately 70% of pupils attending the school were eligible for free school meals[11] at one point over the last six years. This was well over double the national average of 30% of pupils. This is particularly relevant as free school meals have been shown to be a reliable indicator of socioeconomic disadvantage (Taylor, 2018). Additionally, the number of pupils whose first language was not English was approximately five times the national average of 17% and stood at 83%. There were around 5% fewer girls on the school roll than nationally (and consequently approximately 5% more boys). The number of pupils with a Statement of Special Educational Needs or Education, Health and Care Plan was 4%, slightly higher than the national average of 2%.

3.3 Interventions

There are numerous yoga and mindfulness-based intervention programmes that are available for implementation into schools. This section details the intervention programmes adopted within the current research.

3.3.1 Yoga Intervention: Yoga4Schools

There has been a considerable amount of research conducted exploring school-based yoga, predominantly in the US. Butzer, Ebert, Telles, and Khalsa (2015) conducted a survey in America to find 36 different school-based yoga programmes. However, none of the existing school-based programmes were deemed to be accessible or suitable for use

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[11] Free school meals are statutory benefit available to school-aged children from families who receive qualifying benefits (e.g., income-based Jobseeker's Allowance) and who have been through the relevant registration process. For more information see:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/266587/free-school-meals-and-poverty.pdf

in the current study. Consequently, a ten week yoga curriculum was designed in partnership with the Teen Yoga Foundation[12]; a charitable organisation that aims to promote the wellbeing of adolescents through the practice of yoga in schools. The Yoga4Schools curriculum was designed to be delivered in the PSHE lesson within the school curriculum and aimed to develop children and adolescents' socio-emotional skills, including self-regulation and self-esteem. Consistent with the aims of PSHE, Yoga4Schools aimed to engage, empower, and educate children and adolescents on the benefits of yoga in an interactive and practical class setting within the overarching school curriculum. The main objective of the Yoga4Schools curriculum was to give adolescents an introduction to yoga and demonstrate ways in which this may help them in their lives and give them the tools to use yoga as a self-care practice. This included equipping pupils with a toolbox of strategies to improve their wellbeing and self-regulation through breathing and mind-body practices. The curriculum was designed in line with the practical and theoretical recommendations for teaching yoga to children and adolescents to improve mental health and wellbeing (Martinus, 2018).

3.3.1.1 Team of Developers. In Summer 2017, two experienced yoga facilitators met with the researcher (referred to as the curriculum team) to discuss the initial framework for the curriculum, including themes and timings. The curriculum team were led by the founder of the Teen Yoga Foundation (CM), who became a yoga teacher in 2003. CM trains yoga teachers to work with children and adolescents; she has trained over 1300 teachers worldwide and has published a book for yoga therapists (Martinus, 2018). CM worked with the Director of Studies (TC), a Health Psychologist and researcher based at the University of Westminster, with over five years' experience

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[12] For more information, see: http://teenyogafoundation.com

as a yoga teacher. In collaboration, and based on the book written by CM, Year One of the curriculum was developed.

In Year Two, the curriculum team refined and adapted the curriculum. An external researcher, a health economist and yoga teacher (AK), joined to input into the curriculum with an objective perspective. Additionally, two yoga facilitators who had been recruited to teach Year Two, both trained by the Teen Yoga Foundation, took a leading role in adapting the curriculum in line with feedback from Year One. One of the facilitators also drew on their direct experience of teaching the curriculum the previous year. Thus, with a larger curriculum team of six people (Table 2), Year Two of the curriculum was collaboratively developed. Many themes were the same or very similar across both iterations of the curriculum; however, the content and implementation of the sessions were adapted to suit the needs, abilities, and preferences of the pupils (see Section 3.3.1.3 for changes made to the curriculum).

Table 2.

Overview of the Curriculum Developers.

Curriculum Team	Experience	Year		Role
		1	2	
CM	Yoga teacher	✓	✓	Founder of the Teen Yoga Foundation; led the development of the curriculum in Year One; trained the yoga teachers that led on Year Two development.
TC	Yoga teacher and researcher	✓	✓	Overview of research and yoga perspectives.
AS	Researcher	✓	✓	Research lead.
AK	Yoga teacher and researcher		✓	Objective perspective on development and refinement in Year Two, based on feedback from Year One.
AN	Yoga teacher		✓	Led on refining five (out of ten) sessions based on Year One feedback; taught the intervention in Year One and Year Two.
SM	Yoga teacher		✓	Led on refining five (out of ten) sessions based on Year One feedback; taught the intervention in Year Two.

3.3.1.2 Design Considerations. Throughout the curriculum development, Sherman's (2012) guidelines were utilised, which stated that eight domains needed to be addressed in the development of appropriate and robust manuals or protocols: (1) style of yoga, (2) dose and delivery of yoga, (3) components of the yoga intervention, (4) specific class sequences, (5) dealing with modifications, (6) selection of instructors, (7) facilitation of home practice, and (8) measurement of intervention fidelity of time. Each of these domains are described in turn below.

Concerning the style of yoga, Sherman (2012) noted that many different styles of yoga exist, and developers need to consider the demographics and needs of their

population when considering the adoption of a safe and appropriate style. Given the sample was adolescents without a specific health need or disability, it was deemed appropriate to use an active and physical style of yoga. It was postulated that this would increase engagement, activity, and have physical health benefits. Asanas were explicitly chosen for beginners (with appropriate modifications).

In assessing the dose and delivery of yoga, Sherman (2012) suggested that the developers must consider the length and duration of practice (number of weeks and duration of class) necessary to see meaningful change. Yoga interventions vary in length, ranging from spanning an academic year (September - July; Wang & Hagins, 2015) to a single session (Felver et al., 2015). In the review of intervention duration, Sherman (2012) found that the average length of yoga interventions was eight weeks, however this was not specific to school-based yoga. Within the current curriculum, both the dose and delivery were dictated by the school curriculum. As with a regular PSHE class, delivery was once a week for ten weeks, where each session lasted approximately 45-50 minutes. Based on the experiences of yoga teachers in the curriculum team, it was hypothesised that additional practice would be needed to see meaningful change. Therefore, home practice was included as a part of the curriculum to increase the dosage (see consideration 7; facilitation of home practice).

Regarding the various components within the yoga class, there are many activities classically associated with yoga (Sherman, 2012). Given the age of the sample, it was noted that deep states of concentration and meditation might not be achievable and, instead, more focus within classes was given to the physical asanas. The sessions had a general structure that consisted of a 5-minute introduction and check in with pupils, a 5-10 minute discussion of the weekly theme, 20-25 minutes of asanas with associated breathing practices, a quiet 5-10 minute relaxation, and a short check in at the end (for an overview of a standard class structure, see Figure 3). Mindfulness and visualisation

practices were also included within the yoga curriculum as a part of the relaxation. This gave adolescents a sense of the various activities within yoga practice, whilst focusing on the aspects that facilitators believed would be most appropriate for engaging 12-13-year-olds.

The fourth domain of specific class sequences alluded to the debate between standardisation and individualisation within yoga practices. There is an ongoing tension and debate across intervention research generally between allowing facilitators the freedom to adapt intervention sessions, given the variability that may exist in the ability and engagement of different participant groups, versus the need for standardised and replicable programmes (Cutbush et al., 2017; Sherman, 2012). Within the Year One curriculum, more freedom was granted to facilitators to adapt the curriculum in line with the needs of the adolescents in the class. Feedback from Year One, alongside the expertise of the curriculum team, enabled refinement of the sequences in Year Two to include more specific instructions for yoga facilitators to increase the standardisation of the intervention. Despite the more prescriptive nature of the curriculum in Year Two, facilitators were encouraged to prioritise the needs of the class, over prescriptively following the sequences if they were not conducive to the needs of pupils. Modifications for asanas that pupils could not complete were based on the experience and expertise of intervention facilitators.

The sixth dimension highlighted by Sherman (2012) was the experience and qualifications of the facilitators. All facilitators that taught the Yoga4Schools curriculum were trained by the Teen Yoga Foundation to work with children and adolescents. To qualify for the training, facilitators were required to have already completed their 200hr yoga teacher training accreditation prior to enrolment on the course. In addition, any experience teaching in schools or teaching vulnerable or marginalised groups was desired, in line with the suggestion from Sherman (2012) that some interventions may require

additional qualifications or training. All facilitators were in contact with the primary intervention developer at the Teen Yoga Foundation (CM) for support and to address any challenges arising from implementing the curriculum. An overview of facilitators' experience and training is provided in Table 3.

Table 3.

Overview of Yoga Facilitator's Experience and Training.

Year	Facilitator	200 hr Yoga Teacher Training	Teen Yoga training	Length of time teaching children and adolescents	Additional qualifications and experience relevant to research
One	1*	✓	✓	~ 3 years	--
	2	✓	✓	~ 6 years	PGCE qualification in teaching Work across mainstream schools and alternative provision
	3**	✓	✓	~ 3 years	Experience with refugee groups Experience with BAME groups
Two	4	✓	✓	< 1 year	Experience working with at-risk adolescents in Pupil Referral Units Music therapist
	5	✓	✓	~ 2 years	School therapeutic counsellor Children's art therapist

Note. *Facilitator 1 taught weeks 1-5 before Facilitator 3 took over.
**Facilitator 3 taught the intervention in both Year One and Year Two.

The concept of home practice was also raised by Sherman (2012), alongside the recommendation to maintain a "realistic perspective" (p. 9) on the appropriate amount of home practice that participants were likely to engage with. Given the age of the participants in the current study, this expectation was set at 5-10 minutes. Nevertheless, additional exercises were provided as a part of the curriculum to encourage practice

outside of the specific class, help to embed practices, and increase the intervention dosage in Year Two.

Sherman's (2012) final dimension related to intervention fidelity. The growing field of intervention fidelity (Feagans Gould et al., 2016) dictates a range of measures that should be employed within intervention studies to explore if the intervention was delivered as intended. However, Sherman (2012) specifically highlighted the benefits of observing a subset of classes as a means of assessing fidelity. Consequently, two classes (20%) were audio-recorded and assessed against the curriculum by the primary researcher for the presence or absence of critical components within the sessions. This was in addition to intervention facilitator and pupil perceptions of fidelity (see Chapter 5).

Sherman (2012) concluded that more detailed descriptions of the yoga interventions used in research (specifically RCTs) would improve the ability of the yoga community to judge the quality of the evidence and outcomes. Moreover, this should allow replication with other populations to provide further evidence of the effectiveness. Thus, alongside this thesis, the Yoga4Schools manualised yoga curriculum has been published free of charge. In addition to providing transparency as to the exact realm and remit of the intervention, this offers other yoga facilitators and researchers a valuable resource that can be used across other populations and settings.

An excerpt from the curriculum detailing an example class structure is provided in Figure 3.[13]

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[13] The full Yoga4Schools curriculum is published on ResearchGate for other yoga teachers and researchers to access:
https://www.researchgate.net/publication/354334795_Yoga4Schools_Curriclum?channel=doi&linkId=6132127038818c2eaf7b7ce5&showFulltext=true

Figure 3.

Standard Class Structure: Excerpt from the Yoga4Schools Curriculum.

> **WEEK 1: Introduction to Yoga: Taking the first steps**
>
> **Introducing yoga and the concept of the 'beginners mind' as a mind set to approach new experiences (e.g. yoga classes) without set expectations.**

Goals of session:
- Establishing existing knowledge and/or experience of yoga
- Setting guidelines for class in terms of behaviour, attitude but also expectations (which differ from those of normal classes)
- Introduce students to key aspects of yoga (working with breath, body, mind)

Introduction & Discussion 15 mins	*Music playing and space set up when students walk in.* **Welcome** students invite them to take shoes off. Once seated, use singing bowl to bring the room to quiet. Ring three times and ask for a full round of breath every time the tone is heard. Then ring the bowl once, long, and ask students to put their hands up when they can no longer hear the tone. Briefly **introduce** yourself. Ask for a show of hands indicating who has done yoga before. Offer word association - 'what words do you think of when I say yoga?' and write up on the board (relaxation, meditation, stretching etc). Say that the practice we just did was yoga. Yoga and celebrities/sports. **Establish 'ground rules' for the space.** If appropriate, get the class to help. Highlight particularly that this class functions a bit differently from other classes, in that you don't have to do anything if you don't want to, as long as you're not disturbing the people around you. Just 3-4: • Respect the others in the room and yourself • Listen to your own body! • Stay on your own mat • Don't do what doesn't feel good • Rest when you need to
Breathing and Warm up 5 mins	Coherent breathing practice with movements, slowing the movements down as they move through: Inhale arms up, exhale make fists and pull arms down, inhale press palms away, exhale palms to prayer, thumbs to sternum. From sitting, come to **child's pose**, if they want to keep looking around the room then they can prop themselves up on their elbows *('you can rest here if you are feeling tired or breathless throughout the rest of the class').* Standing or seated as appropriate, **warm up joints** starting from ankles and working up. Bear in mind that rolling through ankles/knees/hips standing will require balance! **Half sun salutation** (don't worry about teaching breath) x 2 From standing (mountain pose), arms raised over head, bend knees and fold forwards. Hands to knees, come halfway up to flat back, then fold back down again. Stretch arms up towards the ceiling, then come to standing with hands in prayer

Postures **15 - 20 mins**	*The standing postures and balances can be linked, done individually on R then L sides, or postures can be taken in small groups, i.e. High Lunge into Warrior III etc.* **Full Sun Salutation** with runner's lunges (*'I may invite some of you to teach this part in later weeks, so it's important that you concentrate!'*) Mountain pose > arms up > forward fold > halfway lift > right foot back to runner's lunge > plank > knees down, lower to the floor > low cobra > hands and knees > downward dog > right foot forwards > left foot to join, forward fold > halfway lift > forward fold > arms up overhead > mountain pose Option to take Child's pose or table top instead of Downward Dog (*'Remember to rest whenever you need to in child's pose. Try not to worry too much about what the people around you are doing, see if you can focus on your own mat and listen to your own body. In yoga, the thing we're really doing is trying to get to know ourselves a bit better and be kind to ourselves.'*) Runners Lunge Twisted Lunge Option to take Standing Split High Crescent Lunge and introduce Dristi (*'Fix your gaze on a non-moving spot in front of you, don't let your eyes travel away from this spot'*) Warrior III Mountain pose, establish gaze Tree and/or Tree Variation (ankle across knee) (*'Keep the toes of the lifted leg on the floor if you like, for extra support'*) Seated Forward Bend (*'Bend your knees as much as you need to here, you can choose how far you come into the pose'*) Seated easy pose Repeat coherent breathing exercise we did at the start Seated twist
Relaxation **5 mins**	*Re-start music, and let students know that this is the part of the practice where they can lie down and don't have to do anything, just being quiet and arranging themselves in any comfortable position. They have the option to close their eyes, but they don't have to.* Down on belly, give option to take child's pose or foetal position. Body scan, consecutively squeeze and release feet, heels, legs together, make fists, press armpits, scrunch up face. Full body squeeze and release.
Check-in **5 mins**	**Check-in** with how they feel now - has it changed since the beginning of the class? NB. Checking in with yourself isn't to judge/change what's happening. It's OK if they don't notice anything. (Hands up)

3.3.1.3 Yoga4Schools Intervention Feedback and Changes. Feedback from pupils and professionals was utilised to refine and improve the curriculum throughout the intervention development. Within this iterative design process, a range of feedback was received in Year One from qualitative interviews with intervention facilitators, school staff, and pupils; this was used to adapt elements of the curriculum to ensure it was appropriate to and enjoyable for the population it was designed for. In addition to some of the overall changes to intervention delivery that affected both yoga and mindfulness classes (e.g., class size; see Section 3.6), the following changes were made to the Yoga4Schools curriculum.

Firstly, feedback from Year One indicated that some of the session topics and discussions worked less well as they had limited application to the everyday lives of pupils. In refining the curriculum, Year Two was designed to focus on how topics linked to benefitting pupils (e.g., connecting issues to schoolwork or relationships with friends). As such, some of the topics in Year One were replaced with topics that were deemed to have increased relevance for adolescents. Other topics were kept in the curriculum but slightly amended to link to adolescents' lives more fully. Overviews of Year One and Year Two curricula topics are provided in Table 4 and Table 5. Topics retained between Year One and Year Two are highlighted in bold.

Table 4.

Overview of Yoga4Schools Curriculum: Year One.

Week	Theme	Aims and Objectives
1	**Intro to Yoga – Play***	• To introduce yoga and coming into the flow in a playful and engaging manner
2	**What is Stress?***	• To increase awareness of any tension in the body • To learn how to release tension and manage stresses (including the biology of stress)
3	Coping and Managing in the World	• To manage relationships with ourselves and others • To manage and understand emotions and their relationship to sensations and the body
4	How to Connect with Ourselves and Others	• To understand what connection means, why is it important, and how we get it to others and ourselves
5	**Coming into Presence***	• To understand presence and flow. When are we in flow, when are we present, and when are we not, how do we become present?
6	Release and Finding Balance	• Releasing emotions and finding balance
7	**Focus and Concentration***	• Learning strategies to focus and concentrate • To increasing understanding when focus might be beneficial (inside and outside of school) within their lives
8	**Building Trust and Gratitude***	• To understanding trust - how to trust ourselves and others • To notice and exercise gratitude and contentment
9	**Sleep***	• To understand how yoga can contribute to better sleep • To equip pupils with strategies to sleep easier – falling to sleep, staying asleep, and waking
10	**Conclusion and Summary***	• To summarise each takeaway for each individual – what is helpful, and how can yoga continue to be useful to you?

Note: * Themes in **bold** have also been integrated into the curriculum for Year 2, however the specific name of each week and order of sessions may have differed.

Table 5.

Overview of Yoga4Schools Curriculum: Year Two.

Week	Theme	Aims and Objectives
1	**Introduction to Yoga: Taking the first step***	• To introduce yoga and the concept of the 'beginners mind' as a mind set to approach new experiences (e.g., yoga classes) without set expectations
2	**Being present***	• To introduce the concept of awareness and being present in the current moment without judgement – with links to mind-body awareness
3	**Stress management***	• To notice feelings of stress • To promote an awareness of responses to stress and ways to manage these through yoga
4	Embracing challenges	• Following on from stress, this lesson will explore how pupils can manage other difficult emotions with a growth mind set and encourage them to change their perspective on difficult situations
5	Energy and performance	• To re-energise pupils with empowering asana, focusing on using yoga to support performance
6	**Sleep***	• To increase understanding on how yoga can contribute to better and improved sleep • To give pupils strategies to improve their sleep hygiene
7	**Mental focus and concentration***	• To focus on balance to improve focus and concentration • To teach pupils techniques to increase their concentration with reference to benefits both inside and outside of school.
8	Being your best self	• To encourage pupils to be true to themselves, be compassionate to their imperfections and stop comparing themselves to others • To aim to increase their resilience and belief in themselves to achieve.
9	**Expressing gratitude***	• To encourage pupils to reflect on the world, their relationships, and themselves to explore what they feel grateful for and how they can express their gratitude through acts of kindness to the world and other people
10	**Yoga in everyday life***	• To Summarise the most helpful ideas from the last nine weeks and encourage pupils to think about ways they can continue their yoga practice.

Note: * Themes in **bold** have also been integrated into the curriculum for Year 2, however the specific name of each week and order of sessions may have differed.

Secondly, feedback received from both the intervention facilitators and pupils in Year One suggested that some of the physical asana postures specified in Year One of the curriculum were too hard, too advanced, or too difficult for pupils, which decreased their engagement and motivation. Therefore, in Year Two, changes were made to the asana sequences to ensure that they were appropriate for beginners, with suitable adaptations provided on request (based on the expertise of the intervention facilitator).

Thirdly, pupils and professionals described minimal engagement with the homework element of the Yoga4Schools curriculum. As specified by Sherman (2012), consideration of home practice is an essential consideration within intervention curriculum design and helps to increase the dosage of the intervention. For this aspect of the curriculum, pupils were provided with YouTube videos to follow a physical asana sequence in Year One. However, the data from Year One revealed that pupils did not engage with this aspect of the intervention programme. As such, in Year Two, 'home' practice was changed to occupy a 5-minute window in tutor time (a daily 20-minute slot in the morning), in which school tutors were asked to go through a weekly breathing exercise with pupils as a way of continuing practice outside of the 50-minute classroom slot. These practices were incorporated into each yoga session on a Monday, and school staff were encouraged to continue these daily breathing practices every day in tutor time. Instructions were given to school staff to facilitate these practices (e.g., Figure 4). However, anecdotal feedback from professionals indicated low engagement with these practices.

Figure 4.

Instructions for Weekly Breathing Exercise Example.
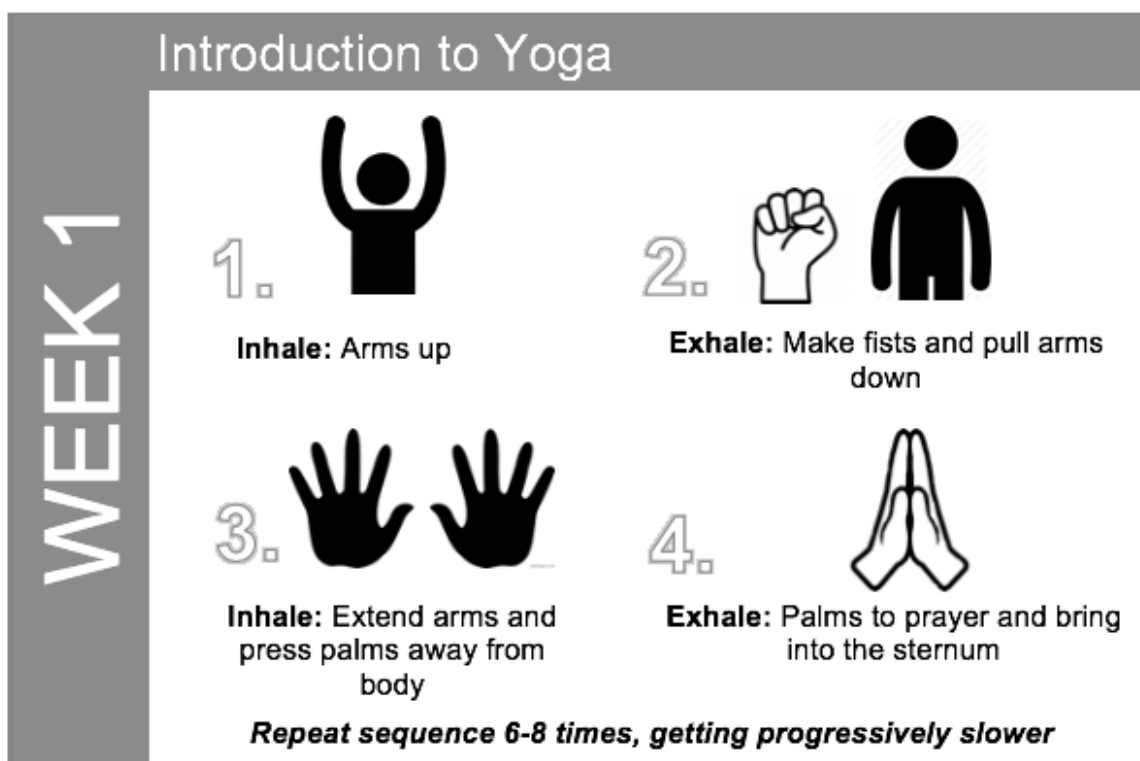
3.3.2 Mindfulness Intervention: .b

Unlike the Yoga4Schools curriculum, the UK has an established mindfulness curriculum for children and adolescents. The MiSP's .b psycho-educational curriculum consists of a set of ten scripted lessons designed for use in secondary schools with participants aged 11-18 years old. As with the yoga intervention, each weekly lesson lasted between 45-50 minutes and was delivered in the PSHE timetable slot. In each session, new themes were introduced, and adolescents were taught new skills in a practical and experiential way with clear application to everyday life. A synthesis of verbal instruction, presentation slides, animation videos, and practical exercises were combined to engage pupils. Home practice was encouraged, which consisted of animations and videos produced by MiSP to encourage home practice of the mindfulness techniques learnt in class. In Year Two, in line with the changes to the Yoga4Schools curriculum, the home practice element was subsumed into tutor time, with pupils and

school staff going through a .b breathing exercise in place of the online resources originally provided in the curriculum.

The .b mindfulness curriculum was designed over the course of a number of years, with input from over 200 teachers, and has its principles firmly based in Mindfulness-Based Stress Reduction courses (MBSR; Kabat-Zinn, 1982). Furthermore, it was designed to be consistent with good practice surrounding effective school-based interventions for mental health and wellbeing promotion (Kuyken et al., 2013). The facilitators who delivered the intervention were trained by MiSP and experienced in delivering the curriculum to adolescents (Table 6). An overview of the MiSP's .b curriculum is provided in Table 7.

Table 6.

Overview of Mindfulness Facilitator's Experience and Training.

Year	Facilitator	8 week MBCT/ MCSR training	.b training	Length of time teaching children and adolescents	Additional qualifications and experience relevant to research
One	1*	✓	✓	~ 6 years	• Qualified to teach mindfulness to adults and younger children
	2	✓	✓	~ 6 years	• Qualified yoga teacher
Two	3	✓	✓	< 1 year	• Qualified to teach mindfulness to younger children
	4	✓	✓	~ 2 years	• Experience working in schools with children with SEND • Qualified to teach mindfulness with adults

Note. **Facilitator 1 taught the intervention in both Year One and Year Two.

Table 7.

Overview of MiSP's .b Mindfulness Curriculum.

Week	Theme	Aims and Objectives
1	An introduction to mindfulness	• An introductory lesson persuades adolescents that mindfulness is worth learning about by making it relevant to their lives in an engaging and entertaining way.
2	Playing attention	• To introduce pupils to the faculty of their attention and how they can purposefully direct attention using simple tools
3	Taming the animal mind	• To nurture an attitude of curiosity, kindness, acceptance and openness that helps to deal more skilfully with these fluctuating mind-states
4	Recognising worry	• To develop understanding that the mind habitually interprets and 'tells stories' about what is happening – we can get stuck in our heads and 'ruminate' or 'catastrophise' • Provide tools and practices to manage these experiences.
5	Being here now	• To explain how 'autopilot' prevents us from being alive and awake to our experience in the here and now; learn to appreciate and savour the pleasant and respond rather than react to the unpleasant.
6*	Moving mindfully	• To develop understanding that Mindfulness is also about movement. We spend time doing actions 'mindlessly' (e.g., walking) • Learning to move mindfully can also be used as a resource for peak performance in sport, music, and the performing arts
7	Stepping back	• To develop an understanding that we have the capacity to 'step back' from difficult thoughts
8	Befriending the difficult	• To better understand stress: where it comes from, why it is necessary, how it works and the potentially harmful effects.
9	Taking in the good	• To encourage an appreciation of what is good in life and explain the ordinary can be experienced as 'good' if we are more fully aware of it
10	Pulling it all together	• To identify what they have found most useful and consider in what areas of their life they might apply their new mindfulness skills.

Note. *This lesson was omitted in Year One due to a scheduled school trip for the mindfulness classes.

3.4 Research Design

This research used a mixed methods design, incorporating both a quantitative and qualitative impact evaluation and a qualitative process evaluation. The process evaluation worked alongside the impact evaluation to help understand the nature and reasons for effectiveness, or otherwise, and explore feasibility and implementation issues to help provide learning for other schools wishing to adopt similar interventions.

Mixed methods designs are defined as those that intentionally combine elements of one method (e.g., surveys) with aspects of another method (e.g., interviews or focus groups) in a simultaneous or sequential routine (Pearce, 2002). This is in contrast to research that is dichotomised into either quantitative or qualitative categories (Tariq & Woodman, 2013), whereby historically, there has been a view that the epistemological assumptions underlying each paradigm were fundamentally inconsistent (Symonds & Gorard, 2010). Fundamentally, quantitative methodologies are associated with positivist approaches; which generally utilise standardised measures for the objective scientific study of the observable world (Bryman, 1984; Mcevoy & Richards, 2006). In contrast, qualitative approaches are more associated with interpretivist stances, which emphasise the subjective way that the world is socially constructed and understood and consider the role of the researcher within meaning-making (Blaikie, 2000; Mcevoy & Richards, 2006).

This tension between epistemological approaches, known as the incommensurability thesis, was problematic for researchers who wished to use both quantitative and qualitative methods within their research. Thus, a third paradigm of mixed methods was proposed, combining the strengths of quantitative and qualitative methodologies and minimising the weaknesses of both, resulting in increased breadth, depth, and richness when compared with the utilisation of a single method (Creswell & Plano Clark, 2007; Schulze, 2003). Recently, researchers have proposed that mixed methods are generally associated with a critical realist approach to epistemology. Unlike

positivism, this approach does not aim to identify generalisable laws, and unlike interpretivism, it does not attempt to understand the lived experience. Instead, critical realism aims to develop deeper levels of understanding and explanation of phenomena (Mcevoy & Richards, 2006). Through this approach, the combination of both methodologies is employed to facilitate triangulation and synthesis of information, giving mixed methodologists a unique aspect within this approach. In this view, the central benefit to mixed methods research lies in combining approaches to better understand the problem or phenomena being researched compared to a single method. This is one of the many reasons why mixed methods studies have become increasingly popular over recent years (Bryman, 2006). However, it must be noted that quantitative, qualitative, and mixed methods research approaches are all equally valuable in different contexts and for different research aims (Johnson & Onwuegbuzie, 2004).

According to researchers in this field, there are many different reasons why researchers may choose to opt for mixed methods designs. Bryman (2006) compiled a comprehensive list of rationales that described why researchers stated they used a mixed methods approach. The most common justifications were enhancement, building upon the quantitative or qualitative findings, and triangulation, which was described as the explanation that quantitative and qualitative findings research might corroborate each other. Completeness, portraying a more comprehensive account of the phenomena under study, and sampling, where one approach was used to facilitate the sample of respects in the other approach, were also cited as key justifications by researchers. Bryman (2006) concluded that mixed methods research had several justifications related to the motivations, research questions, sample, and environment or context in which the research was being conducted.

Creswell (2007) argued that mixed methods approaches were especially helpful in conducting 'real world' research. Therefore, it is unsurprising that one area that has

seen an increase in mixed methods research in the last few decades is the health psychology literature. O'Cathain, Murphy, and Nicholl (2007) reported that the number of mixed methods studies doubled from the mid-1990s to the mid-2000s within the health field. It has been noted that mixed methods studies are particularly useful when exploring complex issues, including health interventions (Raven et al., 2011). Complex interventions were defined as comprising multiple components that interacted to produce change, or lack of (Craig et al., 2008). Subsequently, research questions exploring complex health interventions tend also to be broad and complex with multiple facets. Therefore, such questions can be more comprehensively answered through mixed methods approaches (Tariq & Woodman, 2013), which help determine both the effectiveness of the intervention and how the intervention may or may not work. The importance of answering both of these questions within intervention research has been recognised and championed by both the Medical Research Council (Craig et al., 2008) and Public Health England (2018).

Considering the usefulness of mixed methods for exploring complex phenomena and given the limitations in UK-based research into mindfulness and yoga, mixed methods was deemed to be the most appropriate method to enable the current topic to be as fully explored as possible in a single study. Taking this approach, many of Bryman's (2006) hypothesised justifications were present. Firstly, the research used mixed methods to answer different, yet complementary research questions and triangulate the findings of both sets of data, using the combination of the strengths of both approaches. The research used the qualitative findings to give further context to the quantitative data and give meaning to any unexpected findings. Thirdly, the rationale for using mixed methods related to the ability of both methods to enhance the comprehensiveness, integrity, and usability of the findings. More specifically, the current research adopted a two-phase explanatory sequential mixed methods design (Figure 5), where the research was driven

by the first phase of the impact evaluation (quantitative and qualitative). The second phase, the process evaluation (qualitative data,) was used to further explore and explain the data generated from the impact evaluation (Tariq & Woodman, 2013) to understand any reasons for the effectiveness or otherwise of the yoga and mindfulness.

Consistent with this approach, only the intervention groups were included in the qualitative arms of the research. Indeed, qualitative approaches contribute in several ways to increase the knowledge gain from RCTs of complex interventions. More specifically, qualitative research embedded into RCT designs is useful for exploring participant and facilitator' experiences of and responses to the intervention, the extent to which the intervention was delivered as intended, and to shed light on mechanisms of change (Lewin et al., 2009; O'Cathain et al., 2013). Consequently, these uses of qualitative methods within RCTs are only applicable to those in the intervention groups. Therefore, based upon the theory underlying mixed methods research and practical resource related considerations, interviews were restricted to participants in the yoga and mindfulness intervention groups only to address the research questions. This approach is consistent with other research that has also only conducted qualitative interviews with the intervention group (e.g., Butzer et al., 2017; Conboy et al., 2013).

Figure 5.

Two-Phase Explanatory Sequential Mixed Methods Design.

Research Questions

What impact do yoga and mindfulness have on adolescents' wellbeing?

What impact do yoga and mindfulness have on adolescents' cognitive skills?

How do adolescents, and professionals perceive the acceptability and use of yoga and mindfulness in schools?

How are yoga and mindfulness interventions implemented and delivered in schools; what works and what are the challenges?

Impact Evaluation

Process Evaluation

Quantitative

Qualitative

Qualitative

Pre-intervention survey

Intervention

Post-intervention survey

Interviews with adolescents

Interviews with school staff and intervention teachers

Quantitative analysis and results

Qualitative analysis and results

Qualitative analysis and results

Data merging and interpretation of quantitative and qualitative findings

One of the main strengths of mixed methods research lies in integrating the quantitative and qualitative data to elaborate on findings and increase the validity of the conclusions. This study adopted the most common approach to integration outlined by Tariq and Woodman (2013). In this approach, the two data sets were analysed separately using the analysis techniques outlined in Chapter 4; analyses that are classically associated with that type of data. In this approach, the validity and integrity of the respective data analysis procedures were retained. After analysis of the separate data sets, a second stage of analysis then took place, whereby the quantitative and qualitative findings were combined and triangulated to explore the extent to which the data from different sources supported, contradicted and/or deepened the findings from each methodology (Ponce & Pagán-Maldonado, 2015). O'Cathain, Murphy, and Nicholl (2010) noted that looking for disagreements within the data was a vital step within mixed methods analysis and helps to understand the research questions better. In this way, the research benefitted from capitalising on the advantages of mixed methods to enhance understanding from each data set and bring together a more complete and coherent picture to answer the research questions. Without this second stage of analysis, research into mixed methods theorists have stated that the knowledge gain was equal to what would be achieved from each respective method being employed separately, rather than reaching "a whole greater than the sum of the parts" (Barbour, 1999, p. 42).

3.5 Ethical Considerations

Ethical considerations are of the utmost importance given that research can potentially impact the lives, autonomy, and integrity of individuals (Kjellström et al., 2010). Consequently, to ensure participant safety, the current research adhered to the BPS's ethical guidelines for working with human participants (BPS, 2018b, 2018a). The Code of Ethics and Conduct and the Code of Human Research ethics were followed, alongside the professional and ethical judgement of the researcher and supervisory team.

The Westminster University Research Ethics Committee (UREC) granted full ethical approval for this research project in September 2018 (ETH1718-1686; Appendix B) with amendments in September 2019 (ETH1819-2012*; Appendix C).

At the heart of the BPS guidance and the decision from the research ethics committee was respecting the rights and dignity of participants and keeping them safe from harm. This was particularly important within the current study, where the sample was considered a vulnerable group by the BPS (children under 16 years old; BPS, 2012, 2018a 2018b). In order to protect the vulnerable participant group from any harm or distress, a number of steps were taken in line with the guidance to ensure that the research was conducted ethically and safely.

3.5.1 Informed Consent

Due to the vulnerable nature of the participant group, the 'risk' of the study was increased. Indeed, the BPS defined risk as the "potential physical or psychological harm, discomfort, or stress to human participations" (BPS, 2012, p. 13) arising from the research. In order to manage this risk, several safety procedures were put in place to ensure the safety of participants. Given the setting of the research was school-based, a number of gatekeepers including the Head Teacher, Senior Leadership Team, and the PSHE curriculum lead were consulted in the planning and management of the research. Combined with school and parental consent and the assent of adolescents themselves, the informed consent procedure was three-fold.

Firstly, initial gatekeeper consent was sought from the Head Teacher from the school. The Head Teacher was informed of the aims and methods of the current study and provided consent to confirm that the school was willing to participate in the research. Alongside consultation with school staff, it was reasoned that the research was not deemed to put pupils at any more risk than a standard PSHE lesson.

Secondly, as participants were under 16 years old, the consent of parents/carers was required. Letters were sent home to parents two weeks before the start of the research explaining the aims and methods involved in the research, alongside a form to opt their child(ren) out of any aspects of the research (Appendix D). As the school was integrating yoga and mindfulness interventions into the compulsory school curriculum, parents did not have the option to opt their child(ren) out of the interventions. Instead, the opportunity to opt-out of the research measures was provided. This opt-out consent procedure was consistent with the approach used in other yoga and mindfulness school-based studies (Conboy et al., 2013; Kuyken et al., 2013; Kuyken et al., 2017; Noggle et al., 2012), and research with adolescents more generally (Harding, Whitrow, Maynard, & Teyhan, 2007; Smith, Clark, Smuk, Cummins, & Stansfeld, 2015; Stansfeld et al., 2004).

Despite being under the age of 16 and requiring parental consent, adolescents (12-13-year-olds) were deemed old enough to make an informed decision about their own participation and were also asked to provide consent. Within the informed consent sheet (Appendix E [quantitative] and Appendix F [qualitative]), pupils were informed of their rights within the research process. These included their right to partake in the research voluntarily, what was expected of them if they decided to participate, their right to confidentiality, and their right to withdraw from the research without consequence. Thus, pupils could choose not to participate in any aspect of the research process. Consent from adolescents was sought on an ongoing basis; participation in the surveys, cognitive tasks, and interviews was separate. Adolescents could choose whether to participate in each element of the research.

3.5.2 Confidentiality

The BPS (2012) stated that personal information obtained about participants during research is confidential unless agreed otherwise. This means that research participants should not be identifiable. Across all three informed consent forms,

individuals were informed that their responses were anonymous and confidential (except in exceptional circumstances where harm may arise to the participant or another) and their rights were provided in accessible language (dependent on the audience). In order to maintain confidentiality, no participant (school staff, intervention facilitators, or pupils) was asked for their name. Indeed, professionals were identified only by a participant ID. Similarly, a pupil ID was constructed for pupils made up of their form class, date of birth, gender, and ethnicity (if indicated), which allowed the linking of pre and post-intervention data[14].

The only exception to confidentiality, which was explained to all participants, was in the case of any suggestion of harm to the self or others. In such exceptional circumstances, participants were informed that the researcher may need to relay the information to another individual. In line with school safeguarding procedures, if the researcher had any concerns about a pupil they would raise the issue with the school pastoral team. However, there were no safeguarding concerns raised in the current study.

3.5.3 Right to Withdraw

The consent forms notified participants of their right to withdraw from the research at any point, without providing a reason. This may have meant withdrawing their entire data set or refusing to answer a question on the survey or within the interview. All measures were designed so that participants did not have to answer all questions (e.g., when the surveys were on Qualtrics in Year One, participants could move onto the next question without answering the previous question). Similarly, participants could choose not to respond to any questions within the semi-structured interviews for pupils and professionals. Participants were told that they had one month to withdraw their data, before it was anonymised with a participant number, and was therefore unidentifiable.

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[14] If participants provided the same information (form class, date of birth, gender, and ethnicity) and could not be differentiated, this data was excluded.

3.5.4 Debriefing

As the study did not involve deception, participants were reminded of the purpose of the study and assured that their responses were confidential. For pupils, details of the school pastoral team and other avenues of support were given to ensure they could talk to someone if they wanted to if they experienced any negative emotions resulting from the research. For professionals, they were encouraged to speak with their line manager or supervisor should they feel any discomfort as a result of the research. Lastly, the contact details for the researcher were given to allow participants to get in touch with any concerns or questions about the research.

3.6 Overview of Research

The research employed an experimental parallel cluster RCT design. Clusters were school form classes, which contained mixed genders and mixed academic abilities. This approach was taken as the school setting could not accommodate a random sampling approach. As the intervention classes were delivered to entire classes of pupils (rather than based on a specific need or characteristic), this has been referred to as a universal approach to delivery.

The experimental groups took part in either a ten-week yoga intervention or a ten-week mindfulness intervention in place of their usual once-weekly PSHE lesson, whilst the control group received PSHE as usual (topics covered included: mental health, wellbeing, stress management, citizenship, current affairs, etc.). At the beginning of the school year and prior to the intervention, each class (or cluster) was randomly assigned to a yoga intervention, a mindfulness intervention, or a control group. The randomisation sequence was generated using a computerised random number generator to assign treatment. Given the nature of the study, no parties were blinded to group assignment.

During September 2018 and September 2019, the ten-week yoga and mindfulness intervention programmes were integrated into the curriculum for Year 8 pupils in one

London secondary school. The two-phase explanatory sequential mixed methods design was undertaken twice; once in Year One and once in Year Two. Based on the learning and feedback from Year One, several changes were made to the overall research paradigm and measures. An overview of the changes is provided in Table 8.

Table 8.

Changes Made to Research Protocol Between Year One and Year Two.

	Year One	Year Two
Number of facilitators (per intervention)	2	3
Class size	30 pupils[1]	20 pupils
Home Practice	Expected in pupils' own time	Integrated into tutor time
Attendance	-	Weekly registers
Cognitive measures	- (due to technical difficulties)	Pen-and-paper based tasks
Short-term measures	-	Pre-post class mood measurements
Wellbeing measures	Stress, wellbeing, mindfulness, resilience, & self-compassion	Stress, wellbeing, mindfulness, resilience[2], self-regulation[3], & sleep[3]
Behavioural measures	-	Merits and Demerits

Note. [1]These numbers were originally driven by practical and funding constraints.
[2]Change in validated measure used to measure the construct.
[3]Additional measure added in Year 2.

Firstly, it was highlighted that intervention classes (especially the yoga groups) were cramped, and intervention facilitators found it challenging to work with 30 pupils at once. Pupils concurred and described how classes were loud and distracting, which were sub-optimal conditions for classes focusing on wellbeing and relaxation. Class sizes were initially determined by practical constraints; this was the usual size of the class that would

participate in a PHSE lesson. Whilst the curriculum and research team were aware of the challenges of delivering wellbeing classes to this many pupils, there was no additional funding, staff, or room availability to split the classes up further. However, in Year Two the decision was made to hire an extra yoga and mindfulness facilitator and reduce the number of pupils in each class, working collaboratively with the school to find additional rooms and staff to supervise. Consequently, classes changed from 2 x 30 classes to 3 x 20 classes. An overview of the class structure is provided in **Table 9.**

Table 9.

Overview of class structures in Year One and Year Two.

Year 1

Control		Yoga		Mindfulness	
Class 1	**Class 2**	**Class 1**	**Class 2**	**Class 1**	**Class 2**
Teacher x 1 (existing school staff) Pupils x 30	Teacher x 1 (existing school staff) Pupils x 30	Teacher x 1 Pupils x 30	Teacher x 1 Pupils x 30	Teacher x 1 Pupils x 30	Teacher x 1 Pupils x 30

Year 2

Control		Yoga			Mindfulness		
Class 1	**Class 2**	**Class 1**	**Class 2**	**Class 3**	**Class 1**	**Class 2**	**Class 3**
Teacher x 1 (existing school staff) Pupils x 30	Teacher x 1 (existing school staff) Pupils x 30	Teacher x 1 Pupils x 20	Teacher x 1 Pupils x 20	Teacher x 1 Pupils x 20	Teacher x 1 Pupils x 20	Teacher x 1 Pupils x 20	Teacher x 1 Pupils x 20

Secondly, both pupils and professionals highlighted that pupils did not engage with the home practice aspect of the yoga or mindfulness curriculum, partly because they did not usually have homework from PSHE lessons. Thus, to reduce any stress that the uncompleted home practice caused pupils, and with the aim of further embedding yoga and mindfulness practices into the school day, this 'home' work was moved to breathing exercises to be practised within tutor time. Each form tutor was given a short breathing exercise to use with their class during their daily 20-minute tutor time. Form tutors were also asked to maintain weekly registers as a record of attendance, which may logically affect outcomes; this aspect was not present in Year One.

Lastly, changes to the wellbeing and cognitive measures were made. Regarding the cognitive measures, data was unable to be collected in Year One due to reliance on computerised collection methods. In order to avoid technical difficulties in Year Two, pen-and-paper based tasks were instead used for pragmatic and practical reasons. Similarly, there were also changes made to the wellbeing measures. Within the interviews, pupils repeatedly highlighted that they felt better and more relaxed after these classes, however the pre-post intervention measures used in Year One could not capture this shorter-term change. Thus, a short-term pre-post intervention session measure was integrated into the research protocol as an additional measure. Furthermore, many of the benefits pupils articulated related to aspects of self-regulation, which were also not captured in the Year One battery of measures. Therefore, the measure of self-compassion was replaced with a measure of self-regulation[15]. This was further combined with objective behaviour measures through the school merit/demerit system as a measure of emotional and behavioural regulation. Additionally, other minor changes were related to

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[15] The measure of self-regulation was not just added as the researchers did not want to add to the data collection burden for the school or individual pupils.

the specific measures used (e.g., the Brief Resilience Scale was found to be unreliable and substituted for The Connor-Davidson Resilience Scale).

The majority of the data from both Year One and Year Two has been subsumed and analysed together across both years. However, where there were significant differences between Year One and Year Two, these are highlighted. Moreover, there were instances where certain quantitative aspects were only measured in one year. Again, where this is the case, this has been highlighted.

4. Methodology

4.1 Overview of Chapter

This chapter will provide a detailed description of the quantitative impact evaluation methodology, exploring any impact of yoga and mindfulness interventions in the school. Following this, the qualitative methods are described, focusing on the interviews with adolescents who participated in the interventions, with considerations for the ethical and practical challenges of the power dynamics within interviews. Furthermore, the process evaluation (interviews with professionals) is described, adding further depth to the impact evaluation and any reasons for effectiveness (or otherwise). Lastly, this chapter will discuss how the quantitative and qualitative findings will be combined and integrated to inform the research questions through a triangulation protocol.

4.2 Phase 1: Quantitative Methods

4.2.1 Design and Procedure

The current study represented a 3 (condition: control, yoga, mindfulness) x 2 (time point: pre, post) between-within design to explore any changes after the interventions. In order to explore this, baseline data was collected from all Year 8 pupils who consented to data collection at the beginning of the Autumn term in September 2018 and September 2019. Post-intervention data was again collected from all consenting Year 8 pupils at the end of the term in December 2018 and 2019, approximately one week after the intervention classes had finished. For both surveys, paper-based questionnaires were distributed during a 20-minute form period[16] for completion. The experimental design

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[16] Form period, tutor time, and/or home room is a short period within the school day with the primary purpose of taking the register and record pupil attendance.

and timing of data collection points, alongside participant numbers, for Year One and Year Two can be found in Figure 6.

In Year Two, additional pre-post intervention measures were also introduced, including cognitive tasks, pre-post individual intervention session mood measures, and objective behavioural measures. The cognitive data collection procedures were administered by school staff to pupils in the same sessions as the pre and post questionnaire measures. School staff explained the two pen-and-paper based tasks and gave all consenting pupils 90 seconds to work through the tasks in the allocated time.

In addition to the pre- and post-intervention cognitive measures, during the course of the ten-week interventions, short-term mood change was measured before and after PSHE sessions in one-third of the intervention sessions (three out of ten weeks). Intervention facilitators and/or school staff handed out paper-based questionnaires before and after class, which measured positive and negative affective mood states. Adolescents were invited to circle the emotions they felt before and after class to explore short-term mood changes.

Lastly, at the end of the intervention in Year Two, the school shared the routinely collected merit-demerit system statistics for the previous term, anonymised at class level.

Figure 6.

Flow Chart of Study Design: Wellbeing measures

99
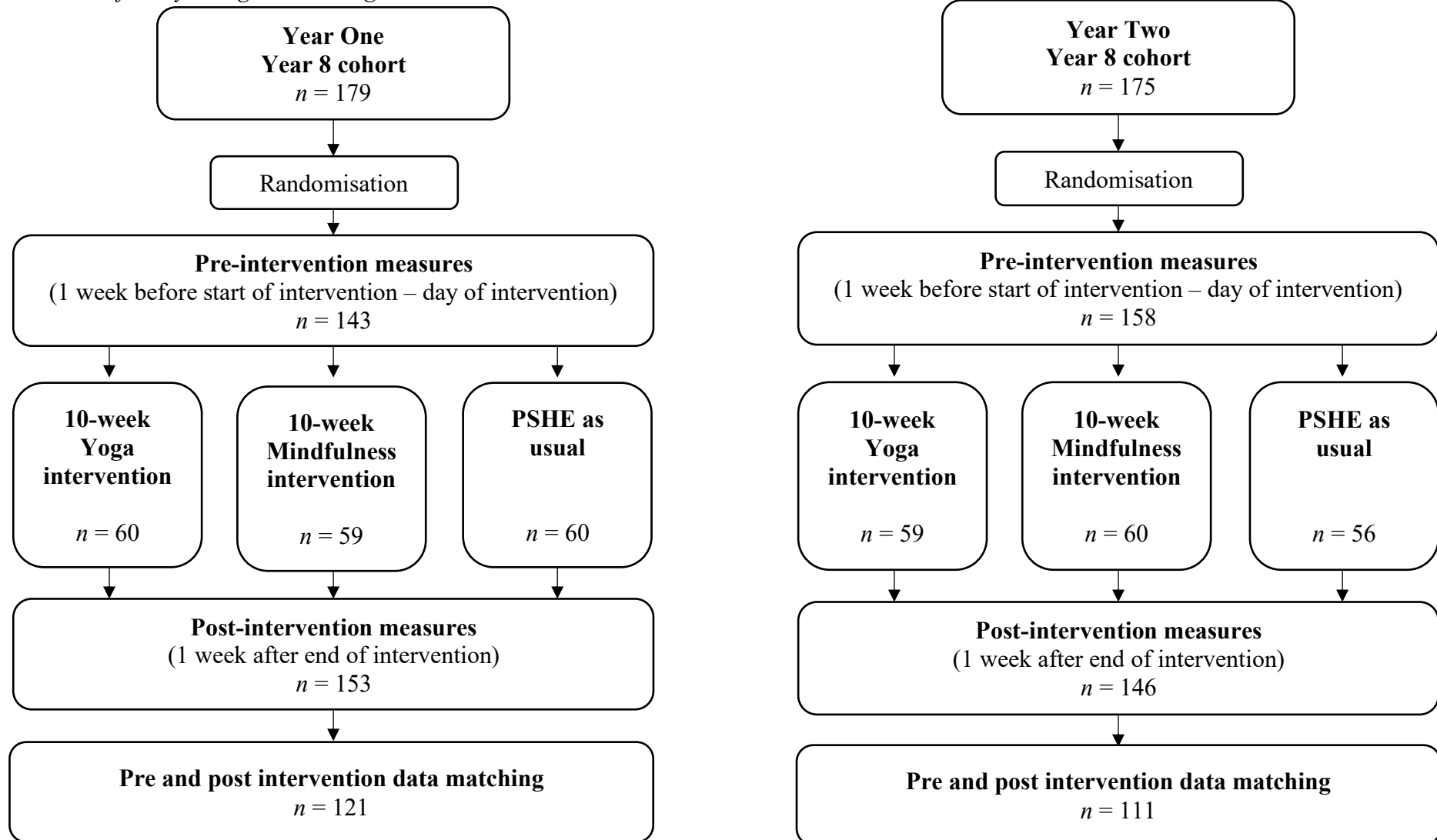
4.2.2 Participants

Prior to data collection an a priori power analysis was conducted, which revealed the desired number of participants to be 160 participants (power of 0.8) to 250 participants (power of 0.95) to detect a medium effect size when employing the traditional $p < .05$ level of statistical significance.

Due to the universal nature of the interventions, all Year 8 pupils who attended the school where the research was taking place were invited to participate in the research. No exclusion criteria were applied to participant selection. All pupils were aged 12-13 years old. In line with the consent procedures adopted, five parents/carers opted their child out of completing the research measures (1.4%).

In Year One, 143 children participated in the pre-intervention questionnaire, whilst 153 children completed the post-intervention questionnaire. Together, 121 participants filled in both the pre and post measures, representing 68% of the Year 8 cohort. In Year Two, 158 children completed the baseline questionnaire, whilst 146 completed the post-intervention questionnaire. In total, 111 participants provided data in both questionnaires, representing 63% of the Year 8 cohort in Year Two.

Participant demographics across the two years of data collection are presented in Table 10 below. There were similar numbers of males and females within the sample, consistent with the gender breakdown of the overall school population, which has slightly more male pupils. The diverse ethnicity of the sample was consistent with the multicultural, inner-city, area where the school was located, where the majority of the sample were from Black, Asian, and minority ethnic backgrounds (BAME).

Table 10.

Matched Participant Demographics from Pre and Post Surveys in Year One and Year Two.

	Year One			Year Two		
	Control	**Yoga**	**Mindfulness**	**Control**	**Yoga**	**Mindfulness**
Sex						
Male	44% (16)	51% (20)	54% (25)	60% (18)	54% (22)	55% (22)
Female	56% (20)	49% (19)	46% (21)	40% (12)	46% (19)	45% (18)
Ethnicity						
Asian	61% (22)	49% (19)	48% (22)	48% (14)	58% (23)	51% (20)
Black	17% (6)	39% (15)	37% (17)	14% (4)	33% (13)	26% (10)
Caucasian	8% (3)	5% (2)	4% (2)	17% (5)	3% (1)	8% (3)
Mixed	3% (1)	5% (2)	4% (2)	17% (5)	5% (5)	10% (4)
Other	11% (4)	3% (1)	7% (3)	3% (1)	3% (1)	5% (2)
Previous experience						
Yoga	14% (5)	28% (11)	15% (7)	38% (11)	12% (5)	16% (6)
Mindfulness	8% (3)	10% (4)	11% (5)	21% (6)	10% (4)	5% (2)
Both	11% (4)	5% (2)	0% (0)	0% (0)	15% (6)	11% (4)
None	68% (24)	56% (22)	74% (34)	41% (12)	63% (26)	68% (26)

Note. Percentages may not always add up to 100 due to roundin

4.2.3 Measures

Standard participant demographic data was collected pre- and post-intervention and consisted of date of birth, form group, and ethnicity. This information was used to match participants across time points. Within the pre-intervention surveys, acceptability measures consisted of questions relating to prior experience of yoga or mindfulness and expectations of yoga and mindfulness classes. Within the post-intervention survey, further questions were asked to ascertain pupils' views and opinions of the classes, frequency of home practice, how much they enjoyed the classes, how helpful they thought the classes were for managing stress and wellbeing, and how they felt about their PHSE teacher (control group: schoolteacher as usual; intervention groups: intervention facilitator). In addition to acceptability, participants were asked about any benefits they experienced from the classes in the post-intervention questionnaire. The perceived benefits used in the post-intervention survey were adapted from the MiSP's .b course feedback form.

4.2.3.1 Wellbeing Measures. In addition to demographics and overall acceptability, the following validated scales were used to measure any impact of yoga and mindfulness interventions on wellbeing, in comparison to a control group. Given the varied impact of yoga and mindfulness on wellbeing (as discussed in Chapter 2, Section 2.3.2 and Section 2.4.2), a range of different measures were adopted to explore how these interventions may impact different aspects of wellbeing, including overall wellbeing, stress, resilience, mindfulness, self-compassion, self-regulation, sleep, and mood. The adoption of multiple outcome measures helps to fully explore the impact of an intervention, especially for more complex outcomes such as mental health and wellbeing (Vickerstaff et al., 2020). It is also necessary as wellbeing is a multidimensional concept

that is characterised as a profile of indicators across multiple domains as opposed to a single domain (Kern et al., 2015).

While some outcome measures remained consistent across Year One and Two, some of the validated measures changed in the second year of intervention rollout. This was based upon both practicality issues and suggestions from the qualitative data that there were benefits that were not being captured by the measures in Year One. Table 11 provides an overview of the measures used across both Year One and Year Two.

Table 11.

Overview of Measures Used in Year One and Year Two of Data Collection.

	Year One	Year Two
Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)	✓	✓
Perceived Stress Scale (PSS)	✓	✓
Child and Adolescent Mindfulness Measure (CAMM)	✓	✓
Brief Resilience Scale (BRS)	✓	
Self-Compassion Scale for Children (SCS-C)	✓	
Connor-Davidson Resilience Scale (CD-RISC)		✓
Adolescent Self-Regulatory Inventory (ASRI)		✓
Adolescent Sleep-Wake Scale (ASWS)		✓
Positive and Negative Affect Scale for Children (PANAS-C)		✓

Warwick-Edinburgh Mental Wellbeing Scale. Adolescents' wellbeing was measured with the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al., 2007). This spectrum included both eudemonic and hedonic wellbeing, and psychological functioning, and subjective wellbeing (Tennant et al., 2007). The items

within the scale measure key concepts within wellbeing including optimism, autonomy, agency, curiosity, relationships, energy levels, and positive affect. Questions within WEMWBS include items such as "I've been dealing with problems well" and "I've been feeling close to other people". Items are measured on a 5-point Likert scale ranging from 1 (none of the time) to 5 (all of the time), whereby higher scores indicate increased levels of general wellbeing (range: 14 – 70). All of the items within the scale are worded positively, which is well-received by participants (Stewart-Brown et al., 2008). WEMWBS has been well validated with adults (Tennant et al., 2007) and adolescents (Clarke et al., 2011). Indeed, Clarke et al. (2011) validated the scale with a sample of over 1500 13-15-year-old adolescents and found high levels of internal consistency (α = .87). This is consistent with the original validation work in students (α = .89) and adults generally (α = .91). Moreover, the internal validity was also in line with the Cronbach alpha coefficients found in the current study (Appendix G: α range = .87 - .91), pointing to the strong internal consistency of this measure with the current study population.

Perceived Stress Scale. Stress was measured subjectively via the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). This scale is the most widely used psychological instrument for measuring the perception of stress within individuals' lives (Lee, 2012). It is used to assess the degree to which situations and experiences are perceived to be stressful, focusing on the last month. Stress is measured through ten questions designed to explore respondents' perceptions of how unpredictable or uncontrollable their lives are. The items were purposefully designed to be non-specific and therefore useful to use with any sub-population group. Questions included items such as "How often have you been upset because of something that happened unexpectedly?" and "How often have you felt you were on top of things?". The questions are measured on a five-point Likert scale ranging from 0 (never) to 4 (very often). The total of the ten items (range: 0 – 40) was used as a measure of stress, whereby higher scores on the PSS

corresponded to higher levels of stress. The PSS has been successfully validated with adult populations (Lee, 2012) and, although not validated, has been extensively used with diverse adolescent populations aged 12-18 years old (Bluth et al., 2016; Carlozzi et al., 2010; Kuyken et al., 2013; Noggle et al., 2012; Quach et al., 2016; Ramadoss & Bose, 2010). Previous literature with adolescent participants indicates good internal consistency (α = .71 −.82; Carlozzi et al., 2010; Ramadoss & Bose, 2010; Quach et al., 2016), which was also observed in the current study (Appendix G: α range = .72 - .84).

Child and Adolescent Mindfulness Measure. The Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer & Smith, 2011) measured mindfulness in the research sample. The scale was initially developed as one of the only measures of childhood and adolescent mindfulness. Whilst a variety of mindfulness scales for adults existed, they often included items unsuitable for children and adolescents (Greco et al., 2011). This motivated Greco et al. (2011) to validate a scale suitable for younger respondents. In its current form, the CAMM is a unidimensional measure designed to examine trait mindfulness in children and adolescents, including present moment awareness, non-judgemental thinking patterns, and non-avoidant responses to thoughts and feelings. The scale whole consists of ten self-report statements, such as "I get upset with myself for having feelings that don't make sense" and "It's hard for me to pay attention to only one thing at a time". Participants rate how true each statement is for them on a five-point Likert scale of scale of 0 (never true) to 4 (always true). All of the items are reverse scored and added up (range: 0 − 40), where higher overall scores on the CAMM correspond to greater levels of overall trait mindfulness. This scale has been repeatedly validated for non-clinical populations of children and adolescents aged 10-17 years old and has shown good internal reliability (α = .70-.81; Greco et al., 2011; Kuby et al., 2015). This is consistent with the observed Cronbach alpha coefficients observed

in the current study (Appendix G: α range = .76 - .84), which further justifies the internal validity of the CAMM for use with young adolescents.

Brief Resilience Scale. The construct of resilience was measured by using the Brief Resilience Scale (BRS; Smith et al., 2008). The scale was designed to measure individuals' ability to manage stress or "bounce back" (p. 194) as opposed to measuring specific protective factors or resources that could facilitate resilience (Smith et al., 2008). Within a methodological review of fifteen resilience measures, the BRS came out as one of the strongest resilience measures for its psychometric ratings (Windle et al., 2011). The BRS contains six items that respondents are asked to agree or disagree with. Example items include: "I usually come through times with little trouble" and "I tend to take a long time to get over setbacks in my life". Participants respond on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) with a neutral option. Scores on the six items are then added up (range: 6-30) and the mean is taken as the overall score, with higher scores indicating higher resilience or ability to bounce back. Due to its conciseness and simple language, alongside the low quality of the adolescent resilience scales (Windle et al., 2011), the BRS was employed in the current study. Across four different samples, the internal reliability was found to be between .70 and .95 (Smith et al., 2008). This Cronbach alpha coefficient is higher than found in the current study (Appendix G: α range = .61 - .64), which falls slightly below the acceptable level and the results should therefore be interpreted with caution.

Self-Compassion Scale for Children. The Self-Compassion Scale for Children (SCS-C; Sutton, Schonert-Reichl, Wu, & Lawlor, 2018) was used in the current study. Self-compassion is defined as the extent to which individuals can turn their compassion inwards and engage in self-kindness, a sense of common humanity, and mindfulness (Neff, 2003). Sutton et al. (2018) adapted and developed the original Short Self-

Compassion Scale (Raes et al., 2011) to use more age-appropriate language for children[17].

Example items include: "I try to be kind towards the things about myself I don't like" and "When something upsets me, I try to stay calm". The SCS-C requires participants to respond to statements on a five-point Likert range ranging from 1 (never) to 5 (always). The total score for the positive and negative self-compassion items are then calculated separately to represent a dual-factor model of self-compassion (range: 6-30 for each sub-scale)[18]. The SCS-C was successfully validated with a cohort of over 400 children aged 8-12 years old to show good validity and internal reliability (Sutton et al., 2018), similar to that for the adult version of the scale (Raes et al., 2011). In the current study (Appendix G), the reliability statistics (positive: α = .76 - .78; negative α = .88 - .91) were similar to the results observed by Sutton et al. (2018; positive subscale α = .81; negative subscale α = .83).

Connor-Davidson Resilience Scale. The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) was developed to measure the ability of individuals to cope with stress and was determined as one of the best measures in a review of resilience scales (Windle et al., 2011). The original 25-item version was validated with numerous populations and has subsequently been adapted into both a ten-item and two-item scale. Based on reading ages, Connor and Davidson (2018) reported that all versions were understandable to children and adolescents aged 12 years and over, despite also being used successfully with younger populations. The 2-item measure was specifically designed to measure the ability of an individual to bounce back from stress (Vaishnavi et al., 2007). The two items were; "I am able to adapt to changes" and "I tend to bounce

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[17] For example, the item "When I fail at something important to me, I become consumed by feelings of inadequacy" was changed to "When I fail at something important to me, I feel like I'm not good enough" to make it more accessible to children and adolescents.

[18] In the scale validation process, the researchers proposed reverse scoring the negative items. However, within the validation process, there was found to be a better fit for separate positive and negative self-compassion scales, with no reverse coding on the negative items. For more information, see Sutton et al. (2018).

back after illness or hard times". These were measured on a five-point Likert scale, ranging from 0 (never true) to 4 (always true). For the final score, both items were added together (range: 0-8), with higher scores indicating higher levels of resilience. The CD-RISC2 has been validated in adolescent samples (Heo et al., 2018; Lim et al., 2011) and has been shown to have good internal reliability (α = .73-.94; Heo et al., 2018; Lim et al., 2011). While the Cronbach's alpha in the current study was lower than recommended limits (Appendix G: α range = .44 - .50) and previous research, it may be more appropriate to inspect the mean inter-item correlation for the items, given the short term 2-item scale. Indeed, Briggs and Cheek (1986) recommend this technique for shorter scales, where correlations between .2 to .4 are the optimal range. Within the current study, the inter-item correlations were within these guidelines (pre-intervention = .330; post-intervention = .334).

Adolescent Self-Regulatory Inventory. Short term self-regulation was measured through the Adolescent Self-Regulatory Inventory (ASRI; Moilanen, 2007). Self-regulation is defined as the degree to which individuals are able to monitor, adapt, and inhibit behaviour, attention, emotion, and cognition based on internal and external cues (Thompson, 1994). The ASRI comprises 36 items, measuring both short and long-term self-regulation. However, only the short-term self-regulation scale was used; this intrapersonal construct focuses on impulse, attentional, and emotional control in the "heat of the moment" (Moilanen, 2007, p. 836) in order to meet immediate objectives. In contrast, long-term self-regulation focuses on impulse, attentional, and emotional control in order to meet future objectives over weeks or months. The 13 items that make up the short-term self-regulation scale are measured on a scale of 1 (not at all true for me) to 5 (really true for me). Example items include "When I'm bored, I fidget or can't sit still" and "I forget about whatever else I'm doing when I'm doing something really fun". After summing the items, higher scores indicate a greater ability to self-regulate in the short

term (range: 13-65). The ASRI has been validated with adolescents aged 11-16 years, and the short-term regulation scale has demonstrated acceptable levels of internal consistency, based on a two-factor model (α = .75–.84; Dias, Garcia Del Castillo, & Moilanen, 2014; Moilanen, 2007). In the current study, however, the internal validity fell slightly below acceptable levels (Appendix G: α range = .64 - .60), and therefore the results should be interpreted with a degree of caution.

Adolescent Sleep-Wake Scale. Sleep duration and sleep quality were measured using the Adolescent Sleep-Wake Scale – Short Version (ASWS; Essner, Noel, Myrvik, & Palermo, 2015; LeBourgeois, Giannotti, Cortesi, Wolfson, & Harsh, 2005). Research has continually pointed to the importance of sleep for overall health, functioning, and wellbeing. It has been well documented that poor sleep or sleep loss are associated with reduced cognitive capacity, attention, executive functions, emotional and behavioural regulation, learning, and memory (Tarokh et al., 2016). Considering the neurobiological and hormonal changes in the developmental period of adolescence, sleep is essential for the cognitive functions and wellbeing of adolescents specifically (Erwin & Bashore, 2017). The ASWS was developed to measure sleep quality in adolescence based on 29 items, measuring five sub-scales and has been widely used in paediatric sleep literature (LeBourgeois et al., 2005). In a subsequent study exploring the factor structure of the ASWS, the 29-item scale was reduced to form a shorter ten-item scale (Essner et al., 2015). Within the shorter scale, the items measured three subscales; (1) falling asleep and retaining sleep (FA range: 5-30), (2) returning to wakefulness (RW range: 2-12) and (3) going to bed (GB range: 3-18). Each measure is rated on a six-point Likert scale ranging from 1 (never) to 6 (always) and includes items across the three subscales such as, "In general, I need help getting to sleep", "In the morning, I wake up feeling rested and alert" and "In general, I am ready for bed at bedtime". Both the original ASWS and the shortened version have been validated in a large sample of adolescents aged 12-18-years-

old. Upon further exploration of the shortened version, it was found that the internal consistency of each of the three subscales (FA: α = .84; RW: α = .87; GB; α = .71) and the total scale (α = .81) were in an acceptable range (Essner et al., 2015) and in some cases were improved in comparison to the original ASWS (LeBourgeois et al., 2005). Consistent with previous research, the internal reliability of the total scale and the subscales within the current study was similar (Appendix G: α range = .68 - .84)

Positive and Negative Affect Schedule. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was the self-report measure used to measure positive and negative mood within the sample. This measure was developed based on the hypothesis that affect, the experience of emotion, could be broadly split into two domains; positive affect (PA) and negative affect (NA). PA refers to emotions such as happiness, joy, and interest, whilst NA refers to aspects of emotional distress including anger, upset, and fear, amongst other unpleasant emotions. There are a number of variations of the PANAS, including the original 20-item version, a longer 60-item version (PANAS-X; Watson & Clark, 1994), and the PANAS-C for children (Laurent et al., 1999) developed to make the terms understandable to children. The PANAS-C includes 27 items; encompassing 12 items in the PA scale (interested, excited, happy) and 15 items in the NA scale (sad, afraid, lonely). The psychometric properties of the PANAS-C were found to be similar to the original PANAS (Watson, Clark, & Tellegen, 1988) with Cronbach alpha coefficients exceeding .92 (Laurent et al., 1999).

In the original PANAS-C, participants must select a response based on a five-point Likert scale of frequency of experiencing each emotion on both subscales. To facilitate data collection pre and post individual 45-minute session, in the current study participants were asked to select only the emotions that they were currently experiencing. As there were uneven numbers of items in the PA and NA subscales, which risks a bias towards participants selecting items on the NA scale, it was deemed necessary to balance

out the number of PA and NA items used in the current study. To increase the number of items, the PANAS-X was utilised, which provided a base of 60 PA and NA words. From this measure, constructs not already covered by the PANAS-C were added to the current measure to provide pupils with a pool of 36 adjectives (Table 12). The number of positive and negative words that participants selected were calculated before and after the session. The PANAS was distributed to adolescents before and after three (out of ten) of sessions to explore short-term mood changes.

Table 12.

Final Item Selection from PANAS-C and PANAS-X.

	Positive Affect	Negative Affect
PANAS-C original words	Interested	Sad
	Excited	Frightened
	Happy	Ashamed
	Strong	Upset
	Energetic	Nervous
	Calm	Guilty
	Cheerful	Scared
	Active	Miserable
	Proud	Jittery
	Joyful	Afraid
	Delighted	Lonely
	Lively	Mad
		Disgusted
		Blue
		Gloomy
PANAS-X additional words	Focused	Angry
	Relaxed	Irritable
	Confident	Sleepy
	Enthusiastic	
	Amazed	
	Awake	
TOTAL	18	18

4.2.3.2 Cognitive Measures. In Year Two a range of cognitive tasks were introduced to examine aspects of self-regulation and executive functions. Within Year One, cognitive data collection was attempted using the online version of the Cambridge

Neuropsychological Test Automated Battery (CANTAB), incorporating a suite of executive functioning tasks to measure attention switching, sustained attention, inhibition, and working memory. However, it was not possible to collect data due to technical difficulties with the server capacity within the school. Consequently, in Year Two, classic pen-and-paper tasks were utilised within the classroom, where all consenting pupils completed the measures simultaneously under time-restricted conditions. These tasks are described below.

Six Letter Cancellation Task. The Six Letter Cancellation Task (SLCT; Appendix H) is widely used in clinical and research settings as a quick-to-administer measure that involves sustained attention, focus and concentration, visual scanning, and activation and inhibition of rapid responses (Bhuyan & Mishra, 2013; Lezak, 1995). The task consisted of a worksheet that detailed six target letters to be identified amongst a grid of distractor letters, arranged randomly in 26 columns and 15 rows. Participants were given 90 seconds to identify as many of the six target letters as possible by putting a slash (/) through them. The test was scored by adding up the total number of cancellations and errors (non-target letters being cancelled); the net score was calculated by deducting the errors from the total cancellations (max score = 90). The total number of cancellations is a measure of motor skill and general cognitive function, while the errors is a measure of limited attention and distraction. The net score is a measure of sustained attention (Bhuyan & Mishra, 2013). Scoring was completed by the primary researcher (AS) and was double scored by an objective third party. The order of the target and distractor letters was changed in the post-intervention task to avoid memory effects, but the target letters and maximum possible score remained unchanged.

Digit-Symbol Substitution Test. The Digit-Symbol Substitution Test (DSST; Appendix I) is considered a measure of complex attention (Lezak, 1995). Jaeger (2018)

concurred and concluded that the DSST measures attention, visuo-perceptual functioning, visuospatial scanning, working memory, and motor speed. Within the current study, the task consisted of a single A4 page that specified nine numbers and their assigned symbol (e.g., 1 is substituted for the symbol =) in a key at the top of the page. Below this, there were four rows of 25 columns, which had a number on the top and a blank space on the bottom. Using the key at the top, participants were asked to fill in the blank spaces with the corresponding symbol. Participants were given 90 seconds to complete as many substitutions as possible, working through them in the order they appeared on the page without missing any out (i.e., working from left to right in each row, before moving onto the next row). If a participant missed out one box, this was considered an error. However, if a participant missed two or more boxes, this was determined as the end point and no more correct symbols were calculated. In order to score the DSST, the total number of substitutions was calculated, and any errors (wrong symbol given or missing value) were deducted from this, resulting in a net score (max score = 100). Scoring was completed by the primary researcher (AS) and was double scored by an objective third-party. In order to avoid memory effects, the pairs of numbers and symbols were changed (i.e., the symbol that corresponded to the number 1 changed to correspond to a different number) in the post-intervention task, but the range/type of symbols remained unchanged.

4.2.3.3 Behavioural Measures. In addition to the self-report wellbeing measures, self-regulation of emotions and behaviours were also measured in Year Two through the schools routinely collected behavioural points system, administered through teacher observations. A 'merit' is a point given to a pupil in response to good or favourable behaviour (e.g., an act of kindness or demonstrating excellent effort in class/homework). A 'demerit' represents a point given to a pupil as a penalty for bad behaviour (e.g., handing in homework late or disruptive behaviour in class). The school provided anonymised, group-level, behavioural data for September-December 2019. Within the

observational behavioural points system, there were 17 positive behavioural points categories and 29 negative behaviour categories. These were grouped into categories (Table 13) and totals were calculated to generate overall scores for each form class.

Table 13.

Positive and Negative Behavioural Points Categories.

	Positive Behaviour Points	**Positive School Work**	**Positive Interaction with Others**		
Positive	• General positive behaviour point 1 • General positive behaviour point 2 • General positive behaviour point 3 • General positive behaviour point 4 • General positive behaviour point 5	• Excellent EAGER engagement • Excellent effort in class • Good communication • Homework of a high standard • Responding well to feedback • Well-developed idea • Classwork of a high standard	• Act of kindness • Charity work • Community act • Resilience • Respect		

	Negative Behaviour Points	**Negative School Work**	**Negative Interaction with others**	**Negative Behaviour**	**Negative Uniform Concern**
Negative	• General negative behaviour point 1 • General negative behaviour point 2 • General negative behaviour point 3 • General negative behaviour point 4	• Disruption of EAGER engagement • Homework incomplete or missing • Insufficient work or effort • Lateness to lesson • Persistent lack of effort • Truancy • Refusal to follow instructions	• Aggression to staff • Bullying • Disrespectful to staff • Disrespectful to peers • Rudeness to staff • Swearing	• Boisterous or dangerous behaviour • Disrupting behaviour • Damage to school property • Disrupting learning • Fighting or violent behaviour • Persistent disruption • Racist, homophobic or sexist behaviour	• Uniform concern • No PE kit • Mobile phone seen or heard • Equipment concern • Eating or chewing

4.2.4 Analysis

4.2.4.1 Approach to Analysis. For the data in the current study, the primary objective was to explore differences between groups (yoga, mindfulness, and control) on a variety of measures, including changes in short and long-term wellbeing, changes in cognitive and behavioural measures, and the acceptability of yoga and mindfulness interventions. The relevant sections of the Findings (Chapter 6) discuss how the assumptions of parametric and non-parametric techniques have or have not been met. Due to the different data types, both types of analytical techniques were adopted to analyse the data, dependent on the presence or absence of any violations to the assumptions of normality and homogeneity. Indeed, Analysis of Variance (ANOVAs) have been reported to be relatively robust to minor violations to normality and heterogeneity (Field, 2013) and have therefore been conducted and reported where appropriate.

Where groups violated the assumptions and/or there were more severe violations, non-parametric tests were used, which have several advantages in such circumstances. Scheff (2016) summarised the benefits of non-parametric tests as (1) being able to be used with numerous different types of data, (2) not restrictive about the assumptions of distribution or variance, (3) not affected by outliers in the data, (4) able to be used with small samples, and (5) able to be used when the data is skewed. However, there are also criticisms of non-parametric techniques. Firstly, they may be less sensitive and less powerful than their parametric equivalents, resulting in a higher risk of Type II errors (Pallant, 2010), where differences between groups that do exist are less likely to be detected. However, this is only the case when the data is normally distributed (Field, 2005). Secondly, the results of non-parametric tests can be more challenging to interpret in comparison to their parametric equivalents (Hoskin, 2010) because most non-parametric techniques use rankings of the data (Field, 2005). Therefore, it is only possible to conclude that one group scored higher or lower than another, rather than the magnitude

of this difference in practical terms. Despite these criticisms, Field (2005; 2013) noted that non-parametric tests are a suitable alternative to use when the data violates the underlying assumptions required by parametric techniques. In these circumstances, non-parametric tests produce more valid data. Indeed, Nahm (2016) wrote that non-parametric techniques are "always valid, but not always efficient", whilst parametric methods are "always efficient, but not always valid" (p. 13).

4.2.4.2 Inferential Statistics. The underlying principles of parametric and non-parametric testing were fundamental in determining the basis of the statistical tests used when analysing the quantitative data. Therefore, both types of data analysis techniques have been employed at the appropriate points throughout Chapter 6. An overview of the analyses employed is provided in Table 14. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 26.

Given that some measures were used across both years of intervention roll-out, this data has been merged to increase the power of the analysis, specifically for the measures of WEMWBS, PSS, and CAMM. Whilst there were changes to the yoga curriculum between Year One and Year Two, the aims of the intervention and the content (e.g., breathing exercises, asana, relaxation) and class structure were consistent across both years, therefore it was deemed appropriate to combine the data. To further justify combining Year One and Year Two data, an Independent Samples T-test was run, which confirmed there were no significant differences between the years for the yoga intervention (see Appendix R). For the remainder of the measures which were only collected in either Year One or Year Two of intervention rollout, it is clearly indicated from which year the data is drawn.

To explore the impact of the interventions between the two timepoints (pre and post), intra-individual difference scores were calculated[19] to quantify the difference on each wellbeing measure. These difference scores are more straightforward to interpret and help to remove unexplained variance (Gollwitzer et al., 2014). Whilst historically difference scores have been criticised for their limited reliability, Gollwitzer et al. (2014) argued that this criticism is not justified and difference scores "can and should be used in social psychological research" (p. 680). Gollwitzer et al. (2014) argued that scepticism around difference scores likely originated from Gulliksen (1950), whose formula for the reliability of difference scores was based on two central assumptions; (1) the reliability of a measure does not change over time and (2) the measures from which the difference score is calculated have the same standard deviation. However, Gollwitzer et al. (2014) asserted that equal standard deviations are rarely found or wanted in social science research. Instead, unequal standard deviations between different time points (e.g., pre and post intervention) indicate inter-individual differences in intra-individual change, as individuals respond differently the effects of interventions. In some cases, the standard deviation at post-intervention may be larger than pre-intervention, leading to a spreading effect, which may occur if the intervention produces a weak situation where other factors influence how participants respond to an intervention (Gollwitzer et al., 2014; Mischel, 1973; Price & Bouffard, 1974). In contrast, the post-intervention standard deviation may become smaller due to the intervention effects, known as the narrowing effect, where the intervention produces a strong situation (Cooper & Withey, 2009; Gollwitzer et al., 2014; Mischel, 1973). Therefore, for the wellbeing measures in the current study, this approach to calculating difference scores has been adopted.

In addition to the primary analyses, several sub-group or secondary analyses were also conducted to explore trends and nuances in the data. Firstly, given the intervention

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[19] Difference scores were calculated by subtracting the pre-intervention score from the post-intervention score.

implementation changes (and changes to the yoga curriculum) in Year Two, additional analyses examined any differences between groups from Year One to Year 2. Secondly, given the SES demographics of the school, further analyses sought to understand any differences in the outcome measures for the most vulnerable group of young people with high levels of stress and low levels of wellbeing. These pupils were identified through median splits of the pre-intervention measures of stress and wellbeing. From these median splits, a new variable was computed to identify this core group of vulnerable pupils. Where there were significant differences between these groups of adolescents, these have been included.

Table 14.

Overview of Statistical Analyses.

		Primary Analyses	Sub-Group or Secondary Analyses
Outcomes	**Wellbeing (pre-post 10 weeks)**	One-way ANOVAs on difference scores to explore any changes after participation with post-hoc Tukey tests (Bonferroni adjusted $p = .025$)	Independent Samples T-tests to explore any differences between Year 1 and Year 2 on difference scores within each condition
			One-way ANOVAs to explore any differences between vulnerable pupils and other pupils with post-hoc Tukey tests
	Mood (pre-post 45min session)	Kruskal-Wallis tests to explore any changes in mood after intervention sessions with follow up Mann-Whitney U tests (Bonferroni adjusted $p = .025$)	-
	Cognition	Paired Samples T-tests to explore changes post-intervention for the yoga and mindfulness groups**	-
	Behaviour	Descriptive statistics only	-
Acceptability	**Enjoyment, managing stress/ wellbeing, and no. of benefits**	Kruskal-Wallis tests to explore differences between groups on perceptions of acceptability with follow up Mann-Whitney U tests (Bonferroni adjusted $p = .025$)	Mann-Whitney U tests to explore any differences between Year 1 and Year 2 within each condition
			Spearman's Rank-order correlations to explore associations between acceptability measures. Fishers r to z transformation to explore any differences between correlations.
	Benefits	Chi-Squared tests for independence to explore differences between groups on the types of benefits experienced with follow up column proportions tests (Bonferroni adjusted $p = .025$)	-

Note. * There was no comparable data provided by the control group.

__Missing data.__ When cleaning the data, scales that required totals to be explored within the analysis were examined for missing data. These scales included the PSS, WEMWBS, CAMM, SCS-C, CD-RISC, ASRS, and the ASWS. If participants had answered the majority of the questions on the scale (this varied by the number of items on the scale)[20], the missing data entry points were replaced by the mean value of the scale for each person; this method is known as person mean substitution. Bono et al. (2007) defined person mean substitution as "substitution of the mean of all of an individual's completed items for those items that were not completed on a given scale" (p. 7); this results in different substitutions for each respondent based on their completed answers. Mean imputation is a popular method for handling missing item responses (Huisman, 2000), and was recommended in instances where less than 20% of the sample had missing data points (Bono et al., 2007; Downey & King, 1998). Furthermore, it was also recommended by Stewart-Brown et al. (2008) in the user guide for WEMWBS. The current research imputed the mean only for cases with more than 80-85% completed data points. Instances with more missing values than the cut-offs were excluded from analysis. Since the BRS (Year One) scale took an average of all responses, this lent itself to handling missing data and did not require imputation.

__Effect sizes.__ Within the analyses, effect sizes have been calculated to help quantify the magnitude of the difference between groups to aid interpretation (Sullivan & Feinn, 2012). The relevant effect sizes and the commonly used magnitudes of effect sizes are detailed in Table 15 (Cohen, 1988; Pallant, 2010).

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[20] The number of items per scale affected the cut-off for mean amputation: WEMWBS = 2/14 items; PSS = 2/10 items; CAMM = 2/10 items; SCS-C = 2/12, CD-RISC = 0/2 items; ASRS = 2/13 items; ASWS = 2/10 items.

Table 15.

Effect Size Magnitudes.

Test		Effect size statistic	Effect size magnitude		
			Small	Medium	Large
Parametric	**ANOVA**	**Partial Eta squared**	.01	.06	.14
	Paired Sample T-test	**Cohen's D**	.20	.50	.80
Non-parametric	**Mann-Whitney U**	*R*	.10	.30	.50
	Chi-Square				
		Cramer's V	.07	.21	.35

4.3 Phase 2: Qualitative Methods

4.3.1 COREQ Criteria for Qualitative Research

In line with the trustworthiness of qualitative data and the importance of reflexivity within qualitative practices, there is growing recognition that research should be well-designed and transparent within its reporting. Indeed, inadequate reporting increases the risk of inappropriate application of research findings in practice and policy. In response to these concerns, and to give qualitative research parity with quantitative research, Tong et al. (2007) developed the Consolidated Criteria for Reporting Qualitative Research (COREQ). Throughout this section, the 32- item COREQ criteria have been utilised to increase the explicit and comprehensive quality of qualitative research reporting. The COREQ checklist is split into three domains; (1) research team and reflexivity, (2) study design, and (3) analysis and findings. The full COREQ and how the research has addressed these considerations can be found in in Appendix O.

4.3.2 Pupil Interviews

4.3.2.1 Considerations for Qualitative Research with Children. The United Nations Convention on the Rights of the Child (UNCRC, 1998) states that every child has the right to express their views and opinions in matters that affect them. As the current research was conducted in a school, it was important to listen to children's views and opinions about the interventions. Nevertheless, in order to appropriately support children to express their opinions, additional ethical and methodological considerations were necessary (see Chapter 3, Section 3.5).

However, qualitative research is further complicated by unequal power dynamics between researcher and participant (Duncan et al., 2009; Kirk, 2007; Kutrovátz, 2017). Whilst power dynamics may be present in research with adults, they are exacerbated by the differences in children's understanding and experiences of the world in comparison to adults (Kirk, 2007). As such, power imbalances may manifest in social desirability bias, where participants try to please the researcher with their responses. Consequently, children may not feel fully able to express their opinions, and instead, try and frame their experiences in a more positive light. Social desirability bias may be further pronounced in face-to-face interviews where children are asked to talk to a stranger about their opinions (Punch, 2002). Considering these risks to both children's rights and the integrity of the data, the current research adopted several recommendations from the literature to manage the power imbalance. These recommendations included giving children maximum opportunities to provide their views, being responsive to their needs, and checking the willingness of children to participate throughout the interviews (Horner, 2000; Kirk, 2007; Mauthner, 1997; Ronen et al., 2001; Thomas & O'Kane, 1998).

The primary recommendation that shaped this research was adopting group interviews to reduce power inequalities (Kirk, 2007; Ronen et al., 2001; Thomas & O'Kane, 1998). Group interviews involve conversing with multiple participants within

the same session, but they are distinct from focus groups. In focus groups, the emphasis is on encouraging participants to discuss the concepts as a group, with the majority of interactions between participants, with minimal input from the researcher. In contrast, the researcher plays a more prominent role in group interviews, interacting with each member of the group separately and checking the consensus with the group (Figure 7).

Figure 7.

Group Dynamics in Group Interviews and Focus Groups.

Group Interview   Focus group
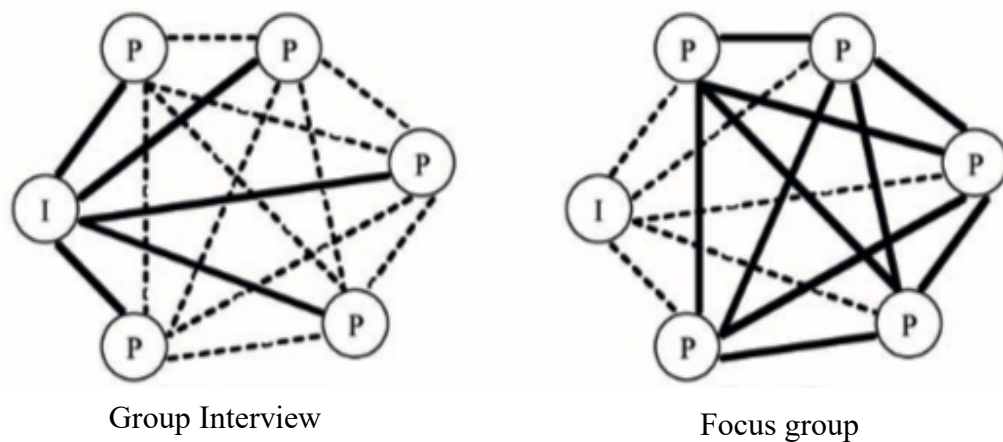
I = Interviewer, P = Participant, ▬ = Strong interaction, _ _ _ = Weak interaction

Note. Image taken from Brown and Edmunds (2011, p. 35).

Due to the different dynamics, power inequalities are reduced as all participants share the responsibility of responding to the researcher's questions (Horner, 2000). Hoppe et al. (1995) referred to this notion as safety in numbers, where participants feel more comfortable sharing, compared to one-to-one interviews. Not only do group interviews mitigate the risks of power dynamics, Punch (2002) found that adolescents preferred school-based group interviews compared to one-on-one interviews, as they felt more comfortable in a group of their peers. In line with this, it has been suggested that children feel less intimidated by an external researcher when they are in a group of their known peers. Therefore, they may be more comfortable offering their honest opinions (Lewis,

1992). Previous research has also suggested that children and adolescents were more engaged in discussions when in a group with friends (Spencer & Flin, 1990). Consequently, this format shifts the power imbalance and encourages children to express their honest views and opinions.

Despite the benefits of group interviews for rebalancing power dynamics, group interviews may not be appropriate for all research topics, especially for more sensitive topics. However, given the focus on school-based interventions, a group dynamic was deemed suitable. Moreover, children are not homogeneous and group interviews may not be the most appropriate method for all; some children may be shy in a group environment and more open in a one-to-one interview, whilst others may be nervous in individual interviews and more confident in a group setting (Hill, 2006; Punch, 2002). Whilst acknowledging this, group interviews were nevertheless adopted within the current research as the most practical and time efficient method of reducing power imbalances.

In addition to group interviews, there may be aspects of the researcher's experience and competence with interviewing children that may build rapport and help to redress the power imbalance. Indeed, qualitative researchers should be capable of creating a safe and comfortable environment for participants (Duncan et al., 2009). However, these skills are even more important in research with children to support children to feel comfortable and talk openly, freely, and honestly (Harden et al., 2000). Research has highlighted that there are numerous 'roles' that the researcher can take on to place the child as the expert, thus developing rapport and facilitating authentic participation (Sime, 2008). These include the adult-as-friend role (Mandell, 1988) and the 'least' adult role (Fine & Sandstrom, 1988; Mandell, 1988; Randall, 2012). However, both have been criticised for underestimating children's competencies and knowledge. Therefore, just because the researcher may try to downplay their 'adultness' does not mean that children will ignore the researcher's adult status (Randall, 2012).

Whilst there is no right approach to adopt, the current researcher positioned herself as a 'curious adult' who lacked knowledge about something that the children were experts in. In doing so, the researcher acknowledged an adult identity but expressed a sincere interest in learning about the experiences of the child (Christensen, 2004). This approach may have been reinforced by the gender of the researcher (female), as research has noted that children and adolescents find young females less threatening and are more comfortable in their presence (Gibson, 2012). Furthermore, the researcher introduced herself by her first name rather than as 'Miss', which distinguished her from school staff and established an informal tone (Mauthner, 1997). The researcher also asked easy "warm-up questions" (Kirk, 2007, p. 1256) within the interview, including the children's interests unrelated to the research topic, to build rapport. Lastly, a tone of positive reinforcement was adopted verbally and non-verbally to show the children that the researcher was listening and wanted to know more (Fargas-Malet et al., 2010).

Whilst steps were taken to build rapport and help children to feel comfortable sharing their views and experiences, this process takes time (Irwin & Johnson, 2005). Therefore, a trusting relationship may not be achieved in a one-off time-limited research session. Nevertheless, the current study employed various techniques to support open and honest communication between the researcher and participants.

4.3.2.2 Procedure. One week after the end of the interventions, Year 8 pupils in the yoga and mindfulness intervention groups took part in face-to-face group interviews with the lead researcher (AS). A purposeful sample was used; school staff were asked to recruit pupils who varied on a number of factors, including gender, engagement with interventions, and perceived enjoyment, to maximise the heterogeneity of the sample. School staff were also asked to think about friendship groups when recommending pupils for interviews, to increase the possibility that everyone would feel comfortable contributing to the discussion. All group interviews were held in one of the school's

meeting rooms, without the presence of professionals (school staff or intervention facilitators). Group sizes varied from 2-5 pupils, consistent with optimal group sizes (Hoppe et al., 1995; Punch, 2002; Ronen et al., 2001). These groups consisted of female-only, male-only, and mixed-gender groups.

All parents provided passive consent (Appendix D) before the interview, and informed consent was additionally sought from adolescents (Appendix F). The group interviews were all conducted by the researcher (AS) using a semi-structured interview guide. The interview guide was developed to explore the views and experiences of the pupils in school-based mind-body classes; including expectations, experiences within the class with a focus on what they liked and disliked, views about the intervention facilitator, any perceived changes after the classes, and suggestions for improvement (Appendix J). Pupils were encouraged to be open and honest in their responses to help adapt the classes for other pupils in the future. Where appropriate, the interviewer probed to elicit further clarification and explanation of statements related to their experience of the classes. The group discussions generally lasted between 25-50 minutes (average: 35 minutes).

4.3.2.3 Participants. A total of 45 participants (age range = 12-13 years old; 67% male) took part in 14 qualitative group interviews. Eight group interviews (totalling 21 pupils) were conducted in Year One, and six group interviews (totalling 24 pupils) were conducted in Year Two (Table 16.

Table 16.

Overview of Participant Numbers: Interviews with pupils.

		Yoga	Mindfulness
Year One	**Male**	6	8
	Female	4	3
Year Two	**Male**	8	8
	Female	3	5
TOTAL		21	24

In comparison to the wider intervention sample, slightly more males in the yoga group took part in the interviews ($n = 15$; 66.7%) than in the intervention sample generally (53.4%) in comparison to females ($n = 7$; 33.3% compared with 46.6% in the intervention sample). A similar disproportionate trend in the number of males participating in interviews ($n = 16$, 66.7%) than the intervention sample generally (55.3%) was observed for the mindfulness group. This was in comparison to female participants in the intervention sample ($n = 8$; 33.3% compared with 44.7%). However, the gender distribution for both the yoga and mindfulness groups was consistent across the quantitative and qualitative methodologies and represented what one might expect with a smaller sub-group sample.

4.3.3 Professional Interviews

4.3.3.1 Procedure. In the month following the end of the intervention classes, all intervention teachers participated in voluntary face-to-face or telephone interviews with the lead researcher within two weeks of the interventions ending. All intervention facilitators provided informed consent prior to the interview via an electric consent form hosted on Qualtrics (Appendix K). The overarching aim of the interviews with the

intervention facilitators was to understand the feasibility and practical implementation of yoga and mindfulness classes within a universal school context. With this aim in mind, the interview guide was developed to explore the views and experiences of those facilitators delivering the curriculum, including practical enablers and barriers, the usefulness of different aspects of the curriculum, and suggestions for improvement (Appendix L). These views and experiences were elicited with consideration to the past teaching experiences of the facilitators and how this way of teaching was similar and/or different to their previous roles of teaching yoga or mindfulness.

In addition to interviews with intervention facilitators, school staff (who sat in on and helped to facilitate intervention delivery) were invited to participate in voluntary telephone interviews with the lead researcher in the weeks following the interventions. In consideration of time schedules of schools staff, more time was allowed between the end of the intervention and the interview (range: 4-10 weeks, with the majority of interviews completed within 4-6 weeks). Furthermore, the PSHE Lead for the school was also invited to participate in an interview to understand the decision making for incorporating yoga and mindfulness into the school curriculum. Informed consent from all participating school staff was sought via an electric consent form hosted on Qualtrics (Appendix K).

The central aim of the interviews with school staff was to understand the feasibility of implementation from the perspective of the school. The interview guide was designed to encourage participants to explore their views of the motivations for the school introducing these classes, perceptions of the classes (and the extent to which they were involved), the engagement of the class, and recommendations for improving implementation (Appendix M). Given the time that had elapsed between the intervention and interviews, questions regarding the sustainability and any lasting changes of the classes were also explored. In the interview with the PSHE Lead, there were also questions about the context of the school, support available within the school for socio-

emotional learning, and decision-making processes for implementing these programmes (Appendix N). The interviews with all professionals generally lasted between 25-90 minutes (average: 52 minutes).

4.3.3.2 Participants. In Year One, all professionals involved in the delivery of yoga and mindfulness interventions participated in telephone interviews. In Year Two, all intervention facilitators participated in interviews. Two of the intervention facilitators (one yoga and one mindfulness intervention facilitators) delivered the intervention in both years and were interviewed after both years due to the changes to implementation and delivery; this was also the case for the PSHE lead. Three out of the six school staff involved in the delivery in Year Two took part in interviews[21]. Subsequently, over the two years, there were 19 interviews conducted with 16 participants (Table 17).

Table 17.

Overview of Participant Numbers: Interviews with Professionals.

		Yoga	Mindfulness	Overview
Year One	**Intervention Facilitators**	2	2	-
	School Staff	2	2	-
	School Lead	-	-	1
Year Two	**Intervention Facilitators**	3	3	-
	School Staff	2	1	-
	School Lead	-	-	1
TOTAL Interviews		9	8	2
TOTAL Participants		8	7	1

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[21] In Year Two, there were challenges in recruitment of school staff. Three of the six form teachers did not respond to multiple interview requests during term time. Following this, the COVID-19 school closure and move to online teaching was the main priority for school staff. Consequently, the researcher stopped data collection.

4.3.4 Data Analysis

4.3.4.1 Data Saturation. The number of individuals who participate is directly related to the quantity and quality of the resultant data. The concept of data saturation within qualitative research refers to the criterion for discontinuing data collection when no new information is generated. Research has shown that data saturation impacts the research, where failure to reach saturation negatively affects the quality and validity of data (Fusch & Ness, 2015; Saunders et al., 2018). There are numerous models of data and theoretical saturation (Saunders et al., 2018), but the current research adopted the model centred on informational redundancy. This model was described:

> *"New data tend to be redundant of data already collected. In interviews, when the researcher begins to hear the same comments again and again, data saturation is being reached… It is then time to stop collecting information and to start analysing what has been collected."*

(Grady, 1998, p. 26)

However, there is no one-size-fits-all answer in terms of the number of interviews needed to achieve informational redundancy (Fusch & Ness, 2015); instead, there are many contributing factors. These include the heterogeneity of the sample, the type of data collection methods, the scope of the study, the nature of the topic, and time and budget considerations (Morse, 2000; Ritchie et al., 2003). Despite the complexity of data saturation and the no one-size-fits-all approach, some researchers have attempted to estimate the number of interviews needed to give researchers the best chance of achieving data saturation. Some have suggested that saturation is likely to occur after 12 interviews (Guest et al., 2006) or 20 interviews (Green & Thorogood, 2013) with specific aims and one participant category. Furthermore, Ritchie et al. (2003) suggested that no more than 50 interviews should be conducted so that researchers can give each interview the analytic attention needed.

Thus, according to these criteria, the number of interviews conducted with pupils sits within these guidelines of 20-50 interviews. The number of interviews with

professionals stands at 19 interviews, which sits just below the guidelines proffered by Green and Thorogood (2013). However, due to the COVID-19 restrictions that saw schools shut on 20th March 2020 (BBC News, 2020; Kim & Asbury, 2020), data collection was discontinued. However, the themes identified in the Year Two interviews were very similar to those present in Year One, indicating that the number of interviews was approaching data saturation.

Whilst there do exist guidelines for the number of interviews (which the current study falls within) and saturation is cited as a key criterion when assessing the quality of qualitative research (e.g., COREQ; Tong et al., 2007), more recently researchers have argued that such operationalisation of saturation is not necessarily appropriate or helpful (Braun & Clarke, 2021). The notion of data saturation rests on the position that saturation is possible as there is a cut off at which no new information is found (Braun & Clarke, 2021. However, this approach has been criticised for being "a logical fallacy" (Low, 2019, p. 131), where all new data collected would arguably add insights to be analysed. Indeed, meaning within qualitative analysis is derived from the intersection between data and the researchers' interpretation; thus, there are always new meanings to be generated (Braun & Clarke, 2021; Sim et al. 2018).

Subsequently, instead of viewing saturation as a fixed point, the current study aligns itself with Low (2019)'s reconceptualization of saturation as pragmatic saturation. This views saturation as existing on a spectrum (Aiken at al., 2015; Saunders et al., 2018), based on the researchers' judgement related to the aims of the research (Low (2019). Subsequently, it is possible that further interviews with pupils and/or professionals may have produced new information. As such, in line with the stance taken by Aiken et al. (2015), the researcher is confident that the data "closely approached" (p. 154) data saturation to provide a rich and deep understanding of the experiences of yoga and mindfulness interventions from the perspective of both pupils and professionals. Most

importantly, the number of interviews conducted provided more than enough data to ensure that the research questions were answered (Bowen, 2008; Low 2019).

4.3.4.2 Thematic Analysis. All interviews were recorded with a Dictaphone and transcribed verbatim. The data was analysed using a Thematic Analysis (TA) approach, a method designed to identify, analyse, and interpret patterns of meaning within qualitative data (Braun & Clarke, 2006; Clarke & Braun, 2017). This approach to data analysis is flexible, without allegiance to a specific theoretical or epistemological position; therefore, it can be applied across a range of research questions and methodologies as a useful tool for enabling rich and detailed interpretation of data (Braun & Clarke, 2006). This was deemed the most appropriate method for analysing the qualitative data compared to other analyses such as grounded theory or Interpretative Phenomenology Analysis[22].

The overarching goal of TA is to generate themes or patterns within the data, which highlight interesting points being expressed by participants in relation to the research aims (Maguire & Delahunt, 2017). In the current study, these aims were exploratory and focused on participants' views, perceptions, and experiences in the implementation and delivery of yoga and mindfulness classes. Subsequently, an inductive approach to data analysis was taken, whereby the themes that were generated were strongly linked to the content of the data itself and were not pre-conceived using existing theoretical frameworks (Patton, 1990). Within this, a semantic approach to themes was adopted, whereby the researcher focused on what participants said and derived meaning from the explicit views and experiences they voiced. This approach was consistent with an essentialist or realist epistemological perspective where motivations, experience, and

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[22] IPA is synonymous with phenomenological epistemological framework and seeks to understand people's experience of reality in great depth (McLeod, 2001; Smith & Osborn, 2003), which was not the aim of the current study. Similarly, grounded theory seeks to develop a plausible theory from the data to address the issue being studied (McLeod, 2001); aims which were also inconsistent with the current study.

meaning are analysed and interpreted in an unassuming manner, without theorising the socio-cultural contexts essential in constructivist approaches (Braun & Clarke, 2006). Whilst this approach was driven by the data, researchers cannot be free of all previous biases or epistemological assumptions (Braun & Clarke, 2006); therefore, the researcher was an active agent in the data analysis process (see Section 4.3.6 for discussion of reflexivity).

As recommended by Braun and Clarke (2006; 2013), there are six phases of thematic analysis which should be applied flexibly to fit the research questions (Braun & Clarke, 2006, 2013; Clarke & Braun, 2017). This is arguably the most influential step-by-step process proffered for TA due to its clear and user-friendly approach to data analysis (Maguire & Delahunt, 2017). The current research study followed Braun and Clarke's (2006) guidelines to structure the analysis. The six phases are outlined in more detail below (adapted from Braun & Clarke, 2006; 2013):

1. **Familiarisation**: This process began with the lead researcher conducting the interviews and followed on with the transcription process (Riessman, 1993), which led to the researcher coming to this first stage with some prior knowledge of the data. Nevertheless, the lead researcher immersed themselves in the data by reading and re-reading the transcripts, looking for prevalent topics and patterns. The data corpus was transcribed and read over twice before the coding process began.

2. **Generation of initial codes**: The focus of the second phase was the generation of initial labels (codes) that identified important features of the data. The computer-assisted qualitative data analysis software, Nvivo, was utilised to code the data corpus. Each transcript was imported into Nvivo and electronically coded to highlight specific words, phrases, sentences, and paragraphs, which illustrated key concepts related to the yoga and mindfulness

classes. In line with the advice offered by Braun and Clarke (2006), coding was done for as many potential themes as possible. The contextual information surrounding specific data extracts was also included in the coding process, and data extracts were coded into more than one code where appropriate. At the end of this stage, each transcript had been coded individually and a list of initial codes was generated.

3. **The search for themes**: The focus of this phase was to analyse the individual codes into clusters of codes, referred to as themes. Potential themes were highlighted where there were codes with similar meanings and/or there were relationships between different codes. The data within each potential theme was collated together and was reviewed and considered against different levels of possible themes (overarching themes, themes, and sub-themes).

4. **Review of initial themes**: Once potential themes and sub-themes were generated, this stage sought to review and refine these through collapsing similar themes into each other, separating out themes deemed too broad or large, and discounting themes without sufficient data to support them. A bi-level process facilitated this process. First, all data extracts within each theme were considered for coherency to the theme and those that were not found to be inconsistent were re-coded and/or discarded from the analysis. The second level involved reviewing the coherency and consistency of themes in relation to the entire data set and data corpus to ensure there was an accurate reflection of the content of the data without any clear omissions. To accurately and systematically do this, each transcript was re-read and any additional or missing elements were recoded into the appropriate themes. Meetings were held with an experienced qualitative researcher to help with the reviewing of themes and ensure the creation of a thematic map with a good level of fit with

the data. In total, 29% of the pupil transcripts and 21% of the professional transcripts were reviewed by the Director of Studies (TC) to ensure agreement within coding and thematic structure.

5. **Theme definition and naming**: Within the fifth stage, concise names encapsulating the different themes were assigned to the overarching themes and sub-themes based on the data evident within each theme. A detailed definition of each theme was developed to capture the story of the individual themes and detail what the focus of each theme was and was not.

6. **Production of report**: The sixth and final stage focused on the researcher writing the themes up into a coherent report to capture the story the data told accurately. Data extracts were chosen for their clarity in highlighting a particular point of view and were surrounded by an analytic narrative to give context to the findings and draw out any similarities and differences in the views and experiences between the different groups of participants. As noted by Braun and Clarke (2006), it was vital to include points of view that deviated from the majority and therefore the researcher did not attempt to "smooth out or ignore" (p. 89) inconsistencies across the data.

Whilst Braun and Clarke (2006; 2013) recommend these six steps, they acknowledged that these phases were not a linear process and, instead, were more iterative and recursive. Thus, movement through and within the six phases was a time-consuming process. However, following this process made the analysis more rigorous, which is one of the main criticisms of qualitative analysis (Braun & Clarke, 2006). Furthermore, the COREQ criteria for analysis and findings is provided in Appendix O.

4.3.5 Trustworthiness

Attride-Stirling (2001) highlighted the need for qualitative research to be conducted in a rigorous and methodical manner to yield trustworthy and meaningful conclusions. However, historically, the trustworthiness of qualitative research has been put into question (Shenton, 2004). In quantitative research, trustworthiness may be considered in terms of the validity and reliability of the data. In qualitative research, however, such terms are not appropriate. As viewed from a realist perspective (Hadi & Closs, 2016), consistent with the epistemological stance adopted in the thematic analysis, the trustworthiness of the data can be defined in terms of four key criteria; (1) credibility – a form of interval validity, (2) transferability – a form of generalisability, (3) dependability – a form of reliability, and (4) confirmability criteria – a form of objectivity (Lincoln & Guba, 1985).

Credibility is concerned with the cohesion of the views offered in the qualitative data collection process and the interpretation and presentation of them by the researcher (Tobin & Begley, 2004). Lincoln and Guba (1985) argued that credibility is integral to demonstrating trustworthy qualitative research. This truth-value criterion can be demonstrated through several strategies, including prolonged engagement, persistent observation, triangulation, member checks, and peer debriefing. Hadi and Closs (2016) recommended using at least two of these strategies within a study to increase trustworthiness. Consequently, the current study adopted the credibility strategies of triangulation and peer debriefing. Triangulation is a process of using multiple data sources to increase credibility (Hadi & Closs, 2016; Shenton, 2004); in the current research, this was achieved through interviews with various stakeholders, including pupils, the intervention facilitators, and school staff who sat in on the classes. This triangulation of data helped increase the richness of the data and corroborate the differing views and inferences resulting from the data. The strategy of peer debriefing was also

adopted, whereby the methodology, analysis and interpretation of data was regularly discussed with both the Director of Studies (TC) who had knowledge about the project, and an objective peer (Creswell & Miller, 2000; Shenton, 2004). These debriefing sessions resulted in helpful debates regarding the analytical process and sought to increase the truthfulness of the findings to the data. Moreover, the credibility and reliability of the findings were checked by TC, who reviewed 20-30% of the transcripts, to ensure agreement and consistency within coding. Any instances of disagreement between coders were discussed until coders reached agreement.

Transferability refers to the generalisability of the findings of the study to other situations (Shenton, 2004). Whilst qualitative research findings are specific to only a small number of individuals, Lincoln and Guba (1985) encouraged researchers to provide as much contextual information as possible to enable readers to come to their own conclusions about the usefulness of the data in different settings. In consideration of this recommendation, Chapter 3 (Section 3.2) highlighted the context of the school and local area, which may be relevant for interpreting the conclusions drawn from the qualitative data. Thus, these considerations can assist in interpreting the results in line with the existing literature regarding yoga and mindfulness interventions. Moreover, readers can then make informed decisions regarding the applicability and generalisability of the findings to their setting. More specifically, other schools with similar characteristics (i.e., mainstream inner-city schools in areas of high deprivation) may wish to learn lessons from the data and tailor their yoga and mindfulness classes in line with the findings.

Dependability refers to the consistency of the findings; if the work were repeated in the same context with the same methods, the results would remain relatively similar or stable (Korstjens & Moser, 2018; Shenton, 2004). Dependability can be achieved through demonstrable, logical, traceable and transparent processes (Nowell, Norris, White, & Moules 2017). In order to provide readers with a deep and thorough understanding of the

processes adopted in the current study, the in-text sections recommended by Shenton (2004) were adopted. Shenton (2004) advocated for sufficient detail within the methodology and analysis sections of qualitative research reports to allow an external researcher to replicate the study. Taking this recommendation on board, the current report included detailed sections on the research design, the data collection processes (the type, length, and approach of the interviews, alongside the specific interview schedules), and analytical process (as based on the thematic analysis steps outlined by Braun & Clarke, 2006). With the provision of this information, readers can make informed and educated conclusions on the degree to which the current study followed "proper research practices" (Shenton, 2004, p. 71) and, subsequently, the dependability of the research.

Lastly, the criteria of confirmability is concerned with objectivity and establishing that the findings are grounded in the data and are not "figments of the inquirer's imagination" (Korstjens & Moser, 2018, p. 121). Generally speaking, confirmability is met when the criteria of credibility, transferability, and dependability are demonstrated (Guba & Lincoln, 1989; Nowell et al., 2017). However, a key step to ensuring confirmability (and to some extent, dependability also) is the role of an audit trail (Korstjens & Moser, 2018; Nowell et al., 2017; Shenton, 2004). An audit trail highlights the reasons for theoretical, methodological, and analytic decisions throughout the project, specifically in the analysis process (Nowell et al., 2017). Within the current project, the analytic audit trail was documented in NVivo and included a reflexive journal detailing the decisions made, analysis meetings, peer debriefing, and the researchers' own critical account of the analysis.

Lincoln and Guba's (1985) four trustworthiness criteria were developed to provide key terminology and a clear structure for researchers to follow. Nevertheless, Lincoln and Guba's (1985) criteria are just one way of assessing trustworthiness. More recently, other researchers have proposed alternative indicators of trustworthiness. For

example, Tracy (2010) proposed eight key markers; a worthy topic, rich rigour, sincerity, credibility, resonance, the significance of the contribution, ethics, and meaningful coherence. Despite this, the credibility, transferability, dependability, and confirmability criteria were utilised in the current study due to the originality and wide use of Lincoln and Guba's (1985) work.

4.3.6 Reflexivity

In addition to the trustworthiness of qualitative data, inherent researcher bias has also been a key debate within the field. The overarching aims of qualitative data are to understand phenomena from the point of view of the participants; how they construct their own meanings into a reality (Jootun et al., 2009). Within this, the researcher must acknowledge their shared role within this meaning-making process. Whilst research subjectivity is unavoidable, researchers can take a number of steps to minimise the influence of their own biases, assumptions, and preconceptions on the research (Ibrahim & Edgley, 2015). Subsequently, the concept and practice of research reflexivity has been advocated by many fields, including psychology (Patnaik, 2013). Shaw (2010) defined the process of reflexivity in the following way:

> "When the researcher and researched are of the same order, that is, both living, experiencing human beings, it is necessary for us as researchers to reflect on how that might impact the research scenario when gathering and analyzing data."

(Shaw, 2010, p. 233)

In essence, reflexivity refers to the researchers' heightened awareness, assessment, and reassessment of their own role and influence on the processes of research design, data collection, and data analysis, thereby facilitating a cyclical progression. By turning this focus inward, the researcher adopts a critical view of themselves and their own behaviour as an active participant in the research (Patnaik, 2013). Reflexivity is central to qualitative research; Braun and Clarke (2006) recommended it as a central

component of thematic analysis , and suggested that researchers keep a reflexive journal as a part of the coding process. Moreover, reflexivity is integral to standards of trustworthiness, and was recommended as a necessary component of the audit trail to demonstrate confirmability (Nowell et al., 2017).

The primary researcher followed these recommendations within the current research and kept a reflexive journal throughout the research process. The journal covered both personal reflexivity and interpersonal reflexivity; a summary of the journal was used to inform the personal reflections of this thesis (see Chapter 1, Section 1.3). With regard to personal reflexivity, covering the researchers own assumptions, biases, and preconceptions, the journal sought to give thinking space to the reflexive questions suggested by Greenaway (2010; as cited in Patnaik, 2013) and Hsiung (2008). The journal also acted as a space to record instances of interpersonal reflexivity, which concerned the researcher-participant interactions (Ibrahim & Edgley, 2015). In practice, this took the form of the researchers' positioning within the research, field notes, reflections after interviews, and thoughts and feelings about data analysis and reporting.

Reflexive journals have become one of the most common approaches for encouraging reflexivity (Patnaik, 2013). Additionally, in line with the COREQ domain of research team and reflexivity, the researcher has been upfront about the necessary information required within the criteria, namely about her personal characteristics and her relationship with participants. In giving readers this information to assess, Tong et al. (2007) noted that this increased the transparency, and therefore, the credibility of the findings. The researcher's responses to the COREQ criteria in relation to reflexivity are provided in Appendix O.

Whilst actions were taken to enhance researcher reflexivity, it is the attitude with which these actions are carried out that is important when considering reflexivity. Probst and Berenson (2014) highlighted that writing a journal entry is not, in itself, a reflexive

action. It is the researchers' attitude and willingness to "launch the double-pointed arrow without knowing where it will land" (Probst & Berenson, 2015, p. 825) within these actions that enables reflexivity.

4.4 Phase 3: Integration of Quantitative and Qualitative Methods

4.4.1 Rationale for Integration

As outlined in Chapter 3 (Section 3.4) health researchers are increasingly using mixed methods studies to evaluate complex interventions. However, data analysis is often conducted separately and the findings are not integrated or merged (Moseholm & Fetters, 2017; Tonkin-Crine et al., 2016). As such, the integration of mixed methods data is still considered one of the main challenges within mixed methods research (Tariq & Woodman, 2013). However, the integration of quantitative and qualitative data is also one of the main strengths of mixed methods research, enabling the elaboration of findings and increasing the validity of the conclusions. When data from multiple sources and methodologies is integrated, the research benefits from capitalising on the advantages of mixed methods to enhance understanding from each data set and brings together a more coherent picture to answer the research questions. Without this second stage of analysis, research into mixed methods has suggested that the knowledge gain is equal to what would be achieved from each respective method being employed separately, rather than reaching "a whole greater than the sum of the parts" (Barbour, 1999, p. 42).

While integrating data has been acknowledged as a challenge, O'Cathain et al. (2010) outlined three techniques for integrating quantitative and qualitative data in mixed methods studies. Firstly, the following a thread method involved identification of a question from one component and following it through to the other component. Secondly, the mixed methods matrix focuses on individual cases that have provided both quantitative and qualitative data. Thirdly, a triangulation protocol involves the development of a convergence coding matrix to identify agreement between methods.

Each of these methods takes place at a different point within the overall study timeline (see Figure 8). It is generally acknowledged that there is a lack of transparency about how researchers integrate findings. Therefore, the triangulation protocol procedure has been described below to increase transparency in specifying how the data was integrated within the current study.

Figure 8.

Point of Application for Three Techniques for Integrating Data in Mixed Methods Research.
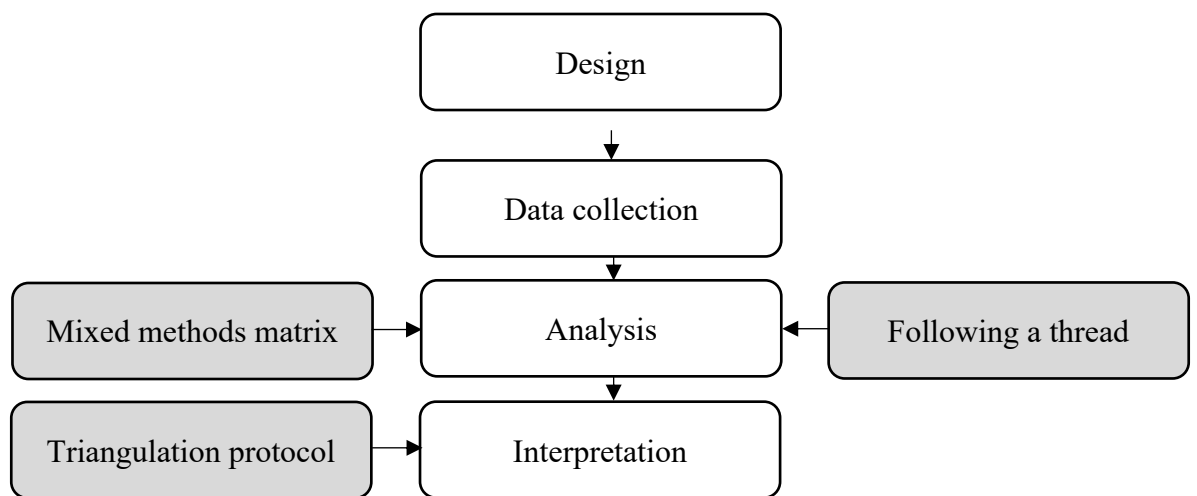
Note. Adapted from O'Cathain et al. (2010, p. 1147).

4.4.2 Procedure: Triangulation Protocol

This study adopted the most common and most detailed approach to integration; the triangulation protocol (O'Cathain et al., 2010; Tariq & Woodman, 2013). In this context, the term 'triangulation' refers to the process of "studying a problem using different methods to gain a more complete picture" (O'Cathain et al., 2010, p. 1147).

In this approach, the two data sets were analysed separately using the analysis techniques described in Section 4.2 (quantitative) and 4.3 (qualitative); analyses that are classically associated with that type of data. In this approach, the validity and integrity of the respective data analysis procedures were retained. After analysis of the separate data

sets, a second stage of analysis took place, whereby the quantitative and qualitative findings were combined and triangulated to explore the extent to which the data from different sources supported, contradicted, and/or deepened the findings from each methodology (Ponce & Pagan-Maldonado, 2015). An overview of this process is provided in Figure 9.

Figure 9.

Mixed Methods Data Integration.
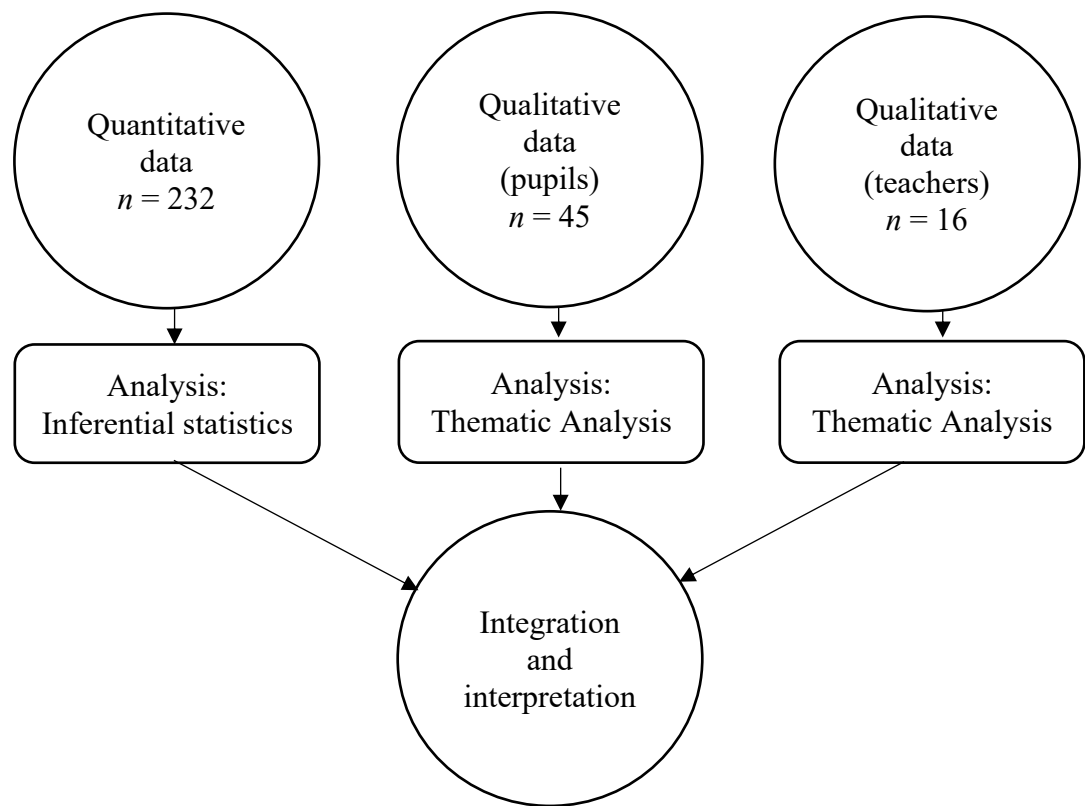
In order to achieve this, a triangulation protocol was developed to combine the quantitative and qualitative data (Farmer, Robinson, Elliott & Eyles, 2006). Whilst initially developed for multiple sources of qualitative data, this method has equal application to mixed methods studies, drawing together the findings from each method on the same page (O'Cathain et al., 2010). Within this method, a convergence coding matrix was produced to highlight the main findings from the quantitative and qualitative

components and judge the similarity or dissimilarity of the data. There were four possible outcomes from this process for each combination of findings; (1) agreement, (2) partial agreement (complementary findings), (3) dissonance (conflicting findings) and (4) silence (finding only highlighted in one data set).

Exploring disagreements or dissonance within the data is a vital step within mixed methods analysis and helps to better understand the research questions (O'Cathain et al., 2010). Moreover, O'Cathain et al. (2010) noted that this method for integrating findings was unique as the only method to consider silences. Silences are particularly important within complex intervention research, where the strengths of quantitative and qualitative methods combine to explore different issues and provide additional insight into the delivery of interventions in practice (Tonkin-Crine et al., 2015).

Based on this approach, a convergence coding matrix was developed for each of the research questions and all relevant quantitative and qualitative data was combined to allow for conclusions to be drawn from the data in a transparent manner. Subsequently, this enabled moving from considering the findings from each method in isolation to considering the additional insights gained from using a mixed methods design.

5. Intervention Fidelity

5.1 Overview of Chapter

This chapter outlines the importance of measuring fidelity of implementation within intervention studies and details the approaches taken to address fidelity within the current study, which is considered key part of intervention development and implementation (Sherman, 2012). The findings related to fidelity of implementation for both the Yoga4Schools curriculum (Year One and Year Two) and the MiSP's .b curriculum are summarised to provide context for the findings presented in the following chapters.

5.2 Fidelity Measurement

Gould, Dariotis, Greenberg and Mendelson (2016) highlighted the importance of assessing fidelity of implementation (FOI) when exploring intervention outcomes. FOI refers to the degree to which intervention delivery adheres to the specific manual, model, or curriculum that the programme is based on (Dane & Schneider, 1998). FOI helps researchers to examine the implementation of an intervention in a real-world setting, which could inevitably affect the conclusions of the research and can lead to intervention refinement and improvement (Carroll et al., 2007). The increased importance of FOI has been noted in specific contextual environments, including schools, given the different microcosms of society that schools can represent (Gould et al., 2016; Gould et al., 2014). Moreover, evidence has repeatedly linked high fidelity with positive programme outcomes (Durlak et al., 2011; Durlak & DuPre, 2008).

Four principal components of FOI have been identified within the literature, namely (1) adherence – the extent to which intervention core components were implemented as intended, (2) dosage – the sum of the quantity of the intervention received by the participants, (3) quality – the degree to which the intervention facilitator ran the

classes as intended and (4) responsiveness – the engagement of the individuals receiving the intervention (Dane & Schneider, 1998; Dusenbury, Brannigan, Falco, & Hansen, 2003; Gould et al., 2016). Researchers generally agree that measuring one, or ideally multiple, aspects of FOI is integral to intervention research (Gould et al., 2016).

The measures of fidelity employed within the current study were consistent with the recommendations of Gould et al.'s (2016) systematic review of FOI of yoga and mindfulness interventions in schools. As per one of the recommendations made, the aim was to address all four dimensions of fidelity to give a multidimensional view of FOI. Therefore, a range of different methods were employed to generate FOI data. An overview of these methods is described in Figure 10.

Figure 10.

Measures to Assess Fidelity of Intervention Implementation.

- Weekly post-session logs
- Post-intervention pupil survey
- Qualitative interviews with pupils

- Facilitator training
- Weekly post-session logs
- Qualitative interviews with intervention

Responsiveness

Adherence

Quality

Dosage

- Facilitator training and experience
- Weekly post-session logs

- Post-intervention pupil survey
- Register from all sessions to monitor attendance (Year Two)
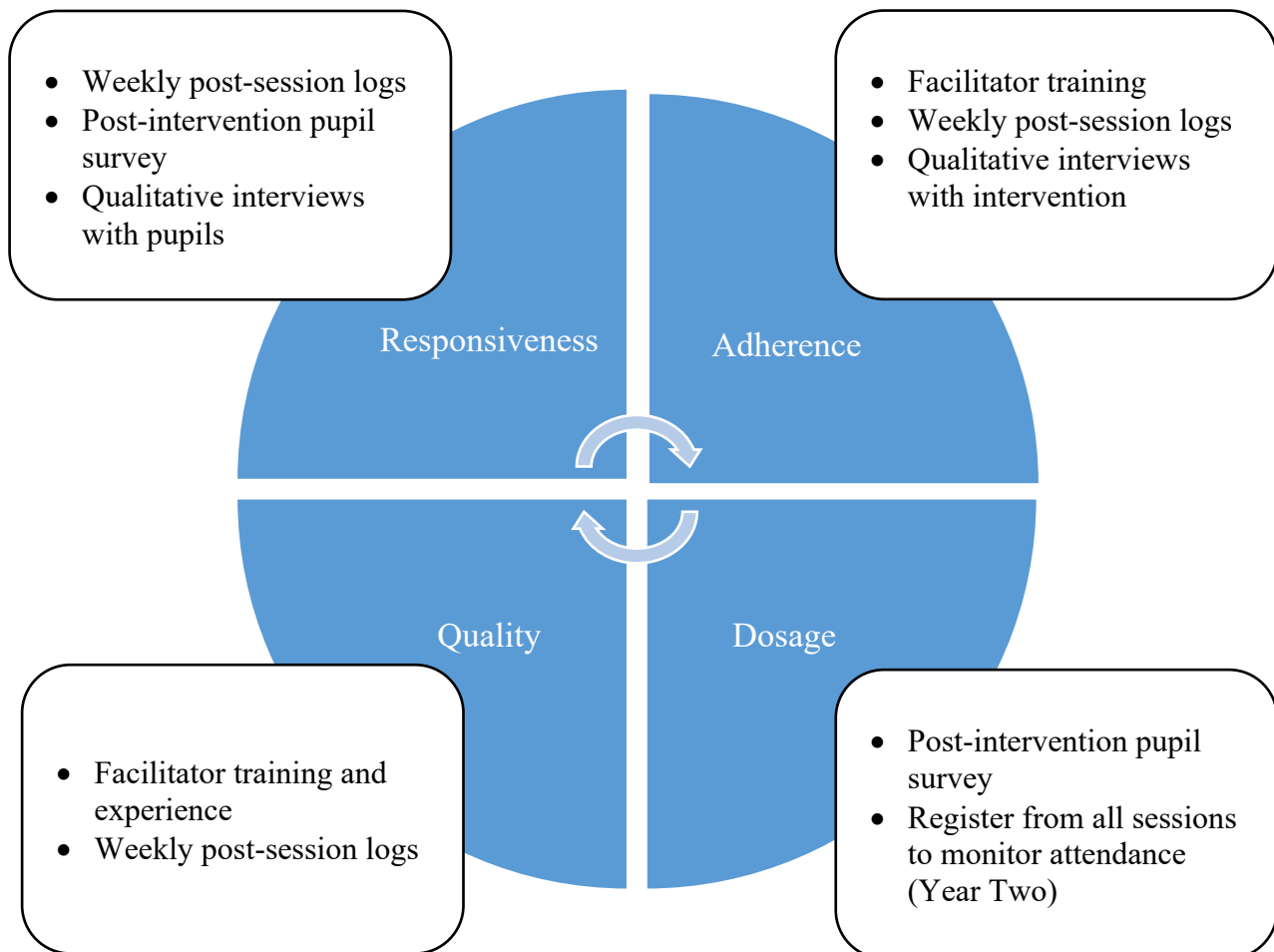
All intervention facilitators were trained by the organisations responsible for developing the intervention curriculums. The mindfulness facilitators were specifically trained in the .b curriculum and had taken part in an intensive 5-day training course as part of their certification to be a qualified mindfulness teacher. Whilst not undergoing the same level of training in the specific curriculum, the yoga facilitators had undergone extensive training to work with adolescents and were in communication with the intervention developer for support in Year One. In Year Two, the facilitators had a more prominent role in the development of the curriculum and were, therefore, more familiar with it. Such measures helped to enable and encourage adherence to the specified curriculum, and the level of training and experience facilitators had sought to increase the

hypothesised quality of the intervention. Adherence, alongside quality and pupil responsiveness, was also measured in session logs submitted by all intervention facilitators after each class (completion rate: 100%; Appendix P). Within the session logs, facilitators indicated the degree to which they delivered the class as intended (on a scale of 1-100%) and how engaged the class was (on a scale of 1-10). In-depth qualitative interviews with the intervention facilitators at the end of the programme also explored adherence, quality, and perceptions of class engagement. Pupil engagement and responsiveness was further measured through the post-intervention surveys, where respondents were asked about their interest and enjoyment of the classes (on a scale of 1-10). This quantitative data was complemented by open-response questions within the survey and interviews with pupils to explore engagement in depth. Lastly, dosage was measured through the post-intervention survey, where pupils were asked about the amount of home practice they had done during the ten-week intervention period. It was hypothesised that this would serve as a better measure of dosage as it indicated the pupils' choice to engage in the practices as opposed to the mandated time spent in PSHE classes. In Year Two, dosage was also monitored through school staff reports of pupil attendance across the ten-weeks.

5.3 Data Analysis

A series of One-Way ANOVAs and Independent Samples T-tests were used to explore the data relating to the fidelity of intervention implementation. Despite the small sample sizes, ANOVAs and T-tests are considered robust techniques (Field, 2013). To confirm the pattern of results, non-parametric Kruskal-Wallis and Man Whitney U tests were also run (reported in footnotes).

5.4 Yoga: Yoga4Schools

The Yoga4Schools underwent significant changes from Year One to Year Two, encompassing pupils and intervention facilitators' feedback. Therefore, the fidelity of Year One and Year Two have been reported separately given these changes.

In Year One, to address the FOI components of adherence and quality, intervention facilitators were asked about the extent to which they delivered the specified class as intended in the curriculum (Table 18). Based on a scale of 1-10, facilitators reported medium levels of adherence ($M = 5.90$, $SD = 1.68$), which equates to 59% adherence. A One-way ANOVA revealed no significant differences between the adherence of each weekly class ($F(9, 8) = 1.40$, $p = .332$, partial $\eta^2 = .612$)[23], whilst an Independent Samples T-test also showed no differences between facilitators ($t(16) = 2.07$, $p = .055$, $d = .98$)[24]; however, this was approaching significance.

In addition to adherence, facilitators were also asked about their perceptions of pupil engagement (Table 18). There was medium to high engagement over the ten-week intervention ($M = 6.75$, $SD = 1.48$). There were no differences when comparing each week ($F(9, 10) = .95$, $p = .526$, partial $\eta^2 = .461$)[25], however there were significant differences between the facilitators on measures of engagement with a large effect size ($t(18) = 3.09$, $p = .006$, $d = 1.38$)[26]. As noted in Chapter 3 (Section 3.3.1), halfway through the ten-week curriculum in Year One the intervention facilitator for one of the classes changed due to unforeseen circumstances. Thus, this may explain these differences.

Taken together, these indicators of FOI would not be considered strong evidence for the fidelity of the Yoga4Schools curriculum in Year One and suggest that the intervention facilitator had a demonstrable impact of the engagement of pupils.

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[23] Yoga Year 1 Adherence: Kruskal Wallis = $\chi^2(9) = 10.99$, $p = .276$.
[24] Yoga Year 1 Adherence – differences between facilitators: Mann Whitney = $U = 22.00$, $z = -1.60$, $p = .109$.
[25] Yoga Year 1 Enjoyment: Kruskal Wallis = $\chi^2(9) = 7.33$, $p = .603$.
[26] Yoga Year 1 Adherence – differences between facilitators: Mann Whitney = $U = 16.00$, $z = -2.71$, $p = .007$.

Table 18.

Year One: Yoga4Schools Fidelity of Implementation.

		Adherence to Curriculum	Engagement of Pupils
Week	1	5.75	7.00
	2	7.10	7.00
	3	4.30	8.00
	4	4.20	5.00
	5	4.00	6.50
	6	4.00	5.00
	7	5.00	7.00
	8	6.35	7.00
	9	6.75	8.00
	10	7.15	7.00
Mean		5.90	6.75
(SD)		(1.68)	(1.48)

As noted in Chapter 3 (Section 3.3.1), the curriculum underwent significant development in Year Two. This reflects a natural development process of honing the aspects of the curriculum that were considered acceptable and adapting aspects that were enjoyed less by the adolescents. In doing so, a more comprehensive curriculum was developed, taking into consideration the feedback of pupils and professionals in Year One.

Across the ten weeks in year Two, yoga facilitators reported high adherence of 79% ($M = 7.85$, $SD = 1.13$; Table **19**), which is significantly higher than observed in Year One ($t(46) = -4.80$, $p < .001$, $d = 1.36$)[27]. There were no significant differences between the adherence of each weekly class ($F(9, 20) = 1.57$, $p = .191$, partial $\eta^2 = .415$)[28] or between facilitators ($F(2, 27) = 1.86$, $p = .175$, partial $\eta^2 = .121$)[29]. Therefore, it can be concluded that the curriculum was administered with high fidelity as intended and encompassed the core components of the intervention.

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[27] Difference between Year One and Year Two Adherence: Mann Whitney = $U = 96.00$, $z = -3.72$, p <.001.
[28] Yoga Year 2 Adherence: Kruskal Wallis = $\chi^2(9) = 12.34$, $p = .195$.
[29] Yoga Year 2 Adherence – differences between facilitators: Kruskal Wallis = $\chi^2(2) = 3.91$, $p = .149$.

For the FOI component of responsiveness, in Year Two intervention facilitators were asked to rate both the engagement of the pupils and an additional question regarding the extent to which they felt they were responsive to pupils (Table 19). Facilitators reported high engagement across the ten weeks ($M = 7.47$, $SD = 1.53$) and high responsiveness to pupils' needs ($M = 8.00$, $SD = 1.15$). There were no significant differences between the engagement of pupils or responsive of facilitators when compared across each weekly class (engagement[30]: $F(9, 20) = 1.04$, $p = .446$, partial $\eta^2 = .318$; responsiveness[31]: $F(9, 20) = 1.29$, $p = .299$, partial $\eta^2 = .368$) or between facilitators (engagement[32]: $F(2, 27) = 1.68$, $p = .205$, partial $\eta^2 = .111$; responsiveness[33]: $F(2, 27) = 1.68$, $p = .206$, partial $\eta^2 = .111$). Thus, this data suggests high responsiveness from the intervention participants and between participants and intervention facilitators.

Interestingly, there were found to be strong significant correlations between adherence to the curriculum and engagement ($r = .787$, $n = 30$, $p < .001$)[34], adherence and responsiveness ($r = .662$, $n = 30$, $p < .001$)[35], and between pupil engagement and facilitator responsiveness ($r = .770$, $n = 30$, $p < .001$)[36]. Whilst not showing causation, these relationships point to the importance of all three concepts in FOI and suggest that the Yoga4Schools curriculum developed in Year Two was delivered with high fidelity (adherence, quality, and responsiveness). Thus, this suggests that an acceptable and useable curriculum was developed over the course of the project, which can be employed in future yoga-based research in the UK.

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[30] Yoga Year 2 Engagement: Kruskal Wallis = $\chi^2(9) = 9.16$, $p = .423$.
[31] Yoga Year 2 Engagement – differences between facilitators: Kruskal Wallis = $\chi^2(2) = 2.53$ $p = .282$.
[32] Yoga Year 2 Responsiveness: Kruskal Wallis = $\chi^2(9) = 9.55$, $p = .388$.
[33] Yoga Year 2 Responsiveness: – differences between facilitators: Kruskal Wallis = $\chi^2(2) = 8.06$, $p = .018$.
[34] Spearman's rank order correlation = ($r_s = .808$, $p < .001$).
[35] Spearman's rank order correlation = ($r_s = .659$, $p < .001$).
[36] Spearman's rank order correlation = ($r_s = .730$, $p < .001$).

Table 19.

Year Two: Yoga4Schools Fidelity of Implementation.

		Adherence to Curriculum	Engagement of Pupils	Facilitators' Responsiveness to Pupils
Week	1	8.33	7.33	8.33
	2	7.83	6.33	7.00
	3	7.50	6.67	8.00
	4	6.67	7.33	7.67
	5	6.66	6.00	6.67
	6	8.50	8.00	8.67
	7	8.50	8.33	8.00
	8	7.50	8.00	8.33
	9	8.17	8.00	8.44
	10	8.83	8.67	9.00
Mean		7.85	7.47	8.00
(SD)		(1.13)	(1.53)	(1.15)

To address the last dimension of FOI (dosage) the number of sessions attended by pupils was monitored in Year 2. Out of the total ten sessions, yoga participants had very high attendance ($M = 9.35$, $SD = .97$, range = 6-10). Given the classes were mandatory within the overarching school curriculum, this is unsurprising. Participants were also asked to self-report the amount of home practice that they engaged in; over half of participants (52%, $n = 53$) reported never or rarely engaging in any practice outside of the home. Only a minority of adolescents reported practice more than once a week (12%, $n = 12$). These findings highlight that participants received a high degree of dosage of the core interventions, but self-motivated dosage was low.

5.5 Mindfulness: .b

Given the MiSP's .b curriculum was the same across both Year One and Year Two, the FOI data has been analysed together. There were no significant differences in adherence or engagement between the two years of intervention roll-out. Across both years, there was high adherence to the curriculum ($M = 8.13$, $SD = 1.86$), which equates to 81% adherence (Table 20). There were no significant differences between the

adherence of each weekly class ($F(9, 36) = 1.49$, $p =.188$, partial $\eta^2 = .272$)[37] or between facilitators ($F(4, 41) = 1.82$, $p =.143$, partial $\eta^2 = .151$)[38].

The FOI data showed that pupils displayed moderate levels of engagement ($M = 6.61$, $SD = 2.29$; Table 20). However, engagement was significantly affected by the week of intervention (and/or the content of each class; $F(9, 36) = 4.33$, $p =.001$, partial $\eta^2 = .520$)[39]. However, Tukey post-hoc tests did not specify the weeks where this difference occurred. This suggests that pupils were more engaged with certain sessions in comparison to others (for example, session 3 'taming the animal mind' was rated as the lowest, in comparison to week 8 'befriending the difficult' was rated as the highest engagement in a session). There were no differences based on the facilitator ($F(4, 41) = 1.78$, $p =.152$, partial $\eta^2 = .148$)[40].

In addition to engagement, in Year Two facilitators were also asked about their own responsiveness to pupils (Table 20). There were high facilitator responsiveness ratings ($M = 7.48$, $SD = 1.29$), suggesting positive facilitator-pupil interactions. There were no significant differences across weeks ($F(9, 19) = .958$, $p =.502$, partial $\eta^2 = .312$)[41] or between facilitators ($F(2, 26) = 1.84$, $p =.179$, partial $\eta^2 = .124$)[42].

Similar to Year Two of the Yoga4Schools curriculum, there were also significant positive correlations (albeit slightly weaker) between adherence and engagement ($r = .516$, $n = 44$, $p < .001$)[43] and engagement and responsiveness ($r = .568$, $n = 29$, $p = .001$)[44,45]. Although correlations cannot point to cause and effect relationships, the positive relationship between these important constructs suggests that, like Year Two of

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[37] Mindfulness Adherence: Kruskal Wallis = $\chi^2(9) = 12.07$, $p =.209$.
[38] Mindfulness Adherence – differences between facilitators: Kruskal Wallis = $\chi^2(4) = 9.90$, $p =.061$.
[39] Mindfulness Enjoyment: Kruskal Wallis = $\chi^2(9) = 27.52$, $p =.001$.
[40] Mindfulness Enjoyment – differences between facilitators: Kruskal Wallis = $\chi^2(4) = 4.26$, $p =.372$.
[41] Mindfulness Responsiveness: Kruskal Wallis = $\chi^2(9) = 9.36$, $p =.405$.
[42] Mindfulness Responsiveness – differences between facilitators: Kruskal Wallis = $\chi^2(2) = 3.63$, $p =.163$.
[43] Spearman's rank order correlation = ($r_s = .466$, p = .001).
[44] Spearman's rank order correlation = ($r_s = .461$, p = .012).
[45] Parametric tests also showed a correlation between adherence and responsiveness (r = .378, n = 29, p = .043), however this was not confirmed when running non-parametric tests ($r_s = .332$, p = .079).

the Yoga4Schools curriculum, the MiSP's .b curriculum was implemented with high levels of intervention fidelity.

Table 20.

MiSP .b Fidelity of Implementation.

		Adherence to Curriculum	Engagement of Pupils	Facilitators' Responsiveness to Pupils (Year Two only)
Week	1	8.75	6.40	8.00
	2	8.94	5.40	8.33
	3	7.16	4.00	6.33
	4	8.32	6.60	7.67
	5	8.70	8.50	8.00
	6*	6.17	6.00	7.67
	7	6.50	4.50	6.50
	8	8.92	9.00	8.00
	9	8.84	6.40	6.33
	10	8.25	8.80	7.76
Mean		8.13	6.61	7.48
(SD)		(1.86)	(2.29)	(1.29)

Note. *Week 6 in Year One was omitted due to unforeseen circumstances; consequently, this data is based on Year 2 only.

The final dosage dimension of FOI was addressed through objective register data and self-report data from pupils about their engagement in any home practice. Pupils demonstrated high attendance ($M = 9.57$, $SD = .95$, range = 4-10). Engagement in home practice, however, was much lower. Half of the mindfulness participants (49%; $n = 49$) reported never or rarely doing the assigned home practice, and only a minority reported practice more than once a week (7%; $n = 7$). Therefore, it can be concluded that the .b intervention was delivered with high levels of dosage for participants within the class, but there was substantially less engagement within assigned home practice aspects of the curriculum.

5.6 Limitations of Fidelity Measures

Whilst the current study assessed multiple dimensions of fidelity, as recommended by Feagans Gould et al. (2016), many of the measures utilised were self-report measures. The only exception to this was the weekly session registers to measure dosage. Indeed, the adherence rate, participant engagement, and facilitator responsiveness were self-reported in the post-session reflections submitted by the intervention facilitators. There are some practical strengths to self-report measures; they are inexpensive, can be completed promptly, and are substantially less time-consuming than observations. Furthermore, Lee et al. (2008) successfully trialled this self-report method with external deliverers in a school-based intervention study. They concluded that it was possible to isolate programme components or sessions within the manual that were more challenging to adhere to from these post-session logs, which could inform future intervention development.

Despite the practical strengths of self-report FOI data, there may be limitations regarding the reliability and validity of this data. Given the subjective nature of these ratings, it is possible that social desirability bias affected the results. To reduce any potential bias, the researcher made it clear to facilitators that these ratings were not being used to monitor performance. Rather they were a way of keeping track of the inevitable challenges that occur within schools-based contextual research. However, it is possible that facilitators reported higher adherence, engagement, and responsiveness than occurred in real-time due to a desire to appear more competent in intervention delivery. Indeed, this pattern of results was observed in a study of a school-based preventative intervention, where programme deliverers reported more positive FOI data than was measured by independent observes (Lillehoj et al., 2004). However, Lillehoj et al. (2004) did note that the FOI ratings from deliverers and independent observers positively correlated, which suggests that self-report measures can detect trends in FOI measures at the very least.

To overcome any potential bias from self-report measures, future research may seek to complement subjective measures with objective measures of adherence and quality. Sherman (2012) recommended observations of classes to ensure that those delivering the intervention are doing so as intended. Feagans Gould et al. (2016) concurred and recommended the development of objective assessments to monitor FOI. Whilst this approach may mitigate the risks of over-reliance on self-report data, observational methods also suffer from limitations. Indeed, observations of intervention sessions can be time and resource-intensive, especially if observing 'live' classes as opposed to audio or video recordings of sessions. There are also reliability and validity concerns with observational methods, which influence the behaviour of the intervention facilitators positively (e.g., facilitators may be conscious they are being monitored and so increase their adherence to the programme content) or negatively (e.g., facilitators may become anxious that they are being monitored, impairing delivery; Breitenstein et al., 2010). Observations may have further disruptive consequences, where an unfamiliar researcher in the classroom setting may disrupt established classroom dynamics and interfere with intervention delivery. Therefore, these risks must be considered against collecting accurate and multifaceted FOI data from multiple perspectives.

Lastly, there are general limitations as to the concept of FOI within complex intervention research. For instance, low levels of programme adherence may not necessarily lead to poor or low-quality intervention delivery (Mars et al., 2013). In contrast, low adherence may result from responsive and adaptive intervention facilitators who modify the delivery of the core concepts in response to group or individual level receipt. For example, if one of the concepts was not understood by the class or they were not enjoying an activity, an experienced intervention facilitator may adapt the class to something that better connects with the individual participants (see Chapter 8, Section 8.2.3 for an example of instances where this occurred in the current research). However,

this approach would be classified as having low adherence in FOI terms. Thus, there are limitations concerning what FOI concepts can be measured, and programme delivery may be affected by more complex dynamics than can be explicitly measured. Indeed, there is currently limited evidence as to if or when programme adaptations positively impact intervention delivery and/or programme outcomes (Gearing et al., 2011). Consequently, whilst FOI is a necessary construct to measure, researchers must remain mindful that FOI measures may not be able to capture all aspects of programme implementation and delivery fully.

5.7 Summary of Findings

FOI is an important construct to measure, especially in the context of school-based research. Within the current study, four dimensions of FOI were measured; adherence, dosage, quality, and responsiveness. The original Yoga4Schools curriculum (Year One) had low to medium levels of fidelity and engagement from pupils was significantly affected by which yoga facilitator delivered the class. However, several changes were made to the curriculum between Year One and Two, based on stakeholder (pupil and professional) feedback. After these changes (see Chapter 3, Section 3.3.1), Year Two of the curriculum was delivered with a high degree of fidelity across all four dimensions. Similarly, the MiSP's. b curriculum was also delivered with high fidelity across both years. However, the weekly content had moderate effects on engagement, suggesting pupils preferred some weeks over others. Whilst these FOI findings are suggestive of high fidelity, it should be noted that most measures were self-report, which may have been influenced by social desirability bias.

6. Quantitative Findings: Exploration of the Impact of Yoga and Mindfulness on Adolescents' Wellbeing, Cognition, and Behaviour

6.1 Overview of Chapter

This chapter will report on the statistical exploration of any differences between the yoga, mindfulness, and control groups on the outcome and acceptability measures. Firstly, the data from the outcome measures data are reported, exploring any group differences on changes pre-post intervention on wellbeing (pre-post ten-week intervention: wellbeing, stress, mindfulness, resilience, self-compassion, self-regulation, and sleep; pre-post 45-minute intervention class: mood), cognition, and behaviour. Secondly, intervention acceptability measures were examined, exploring any differences between groups on their post-intervention perceptions of enjoyment (including how much pupils learned, the usefulness of sessions for managing stress and wellbeing, and their attitudes towards their PSHE teacher), and perceived wellbeing benefits. While the overall approach to analysis is documented in Chapter 4 (Section 4.2.4), further details are provided in the relevant sections below.

6.2 Outcomes

6.2.1 Wellbeing

Over the two years of the project, both curriculum-based (pre-post ten-week intervention) and class-based (pre-post 50-minute intervention session) wellbeing measures were collected. The first part of this section details the longer-term affect measures, exploring any differences between the groups over the course of the ten-week intervention, whilst the second part of this section explores any changes over the individual 45-minute intervention sessions. This section reports on the findings thematically (per outcome measure), however see Appendix R for a breakdown per year of intervention rollout.

6.2.1.1 Wellbeing: Pre-Post 10-week Intervention. These pre-post intervention analyses were conducted only with the participants who provided data at both pre-intervention and post-intervention time points; Year One ($n = 121$), Year Two ($n = 111$), and combined ($n = 232$). Due to the variation in measures used across Year One and Year Two, only those measures used in both cohorts were combined, namely wellbeing (WEMWBS), stress (PSS), and mindfulness (CAMM). For the remainder of the measures, it is indicated from which year the data are drawn.

A parametric approach to analysis was taken when exploring the pre-post intervention measures, as the data mostly observed the assumptions of normality and homogeneity of variances. Therefore, a series of one-way ANOVAs were employed on difference scores (post intervention score minus pre-intervention score) for the key variables. The majority of the variables were found to have a normal distribution. However, in instances where a group or variable violated this assumption (see Appendix Q for normality data), non-parametric Kruskal-Wallis tests were also run to confirm the pattern of findings (reported in footnotes). Subgroup analyses were also conducted to compare Year One and Year Two and to compare vulnerable pupils with the rest of the cohort. Where there were significant differences between these sub-groups, these have been included (with Bonferroni corrected $p = .025$). The results of all analyses can be found in Appendix R and Table 21 shows the descriptive statistics for all measures.

Wellbeing (WEMWBS). There were no significant differences between the control, yoga, and mindfulness groups when the data from Year One and Year Two were combined $F(2, 210) = .99$, $p = .275$, partial $\eta^2 = .009$)[46]. There were also no differences in

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[46] The mindfulness group (Merged) violated the assumption of normality. Kruskal Wallis = $\chi^2(2) = 1.59$, $p = .452$.

Year One ($F(2, 108) = 1.30$, $p =.276$, partial $\eta^2 = .024$), or Year Two ($F(2, 99) = .78$, $p =.462$, partial $\eta^2 = .015$)[47].

Stress (PSS). There were no significant differences between the groups on changes in stress levels in Year One ($F(2, 114) = .71$, $p =.494$, partial $\eta^2 = .012$)[48] or Year Two ($F(2, 105) = .19$, $p =.822$, partial $\eta^2 = .004$), or when this data was combined ($F(2, 222) = .39$, $p =.681$, partial $\eta^2 = .003$)[49].

Mindfulness (CAMM). There were no significant differences between the control, yoga, and mindfulness groups on measures of mindfulness (Combined: $F(2, 200) = 1.14$, $p =.323$, partial $\eta^2 = .011$; Year One: $F(2, 98) = .98$, $p =.378$, partial $\eta^2 = .020$; Year Two: $F(2, 99) = .29$, $p =.748$, partial $\eta^2 = .006$).

Whilst the combined group showed no significant differences, there were interesting differences when the sample was broken down for sub-group analyses. For vulnerable pupils (with high levels of stress and low levels of wellbeing), there were significant differences between the control, yoga, and mindfulness groups with a medium effect size (Appendix R; $F(2, 70) = 3.14$, $p = .050$, partial $\eta^2 = .082$). Post-hoc Tukey tests did not reveal any differences between groups at the Bonferroni corrected significance level. There were also significant differences for the 'other' (i.e., those not identified as vulnerable), group of participants ($F(2, 121) = .3.98$, $p = .021$, partial $\eta^2 = .062$). Post hoc Tukey tests showed that the control group scored significantly higher than the mindfulness group ($p = .020$). These results suggest that non-vulnerable participants in the control group became more mindful, whilst those in the mindfulness group saw their mindfulness skills decrease.

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[47] The mindfulness group (Yr 2) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = 1.29$, $p =.524$.

[48] The mindfulness group (Yr 1) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = .58$, $p =.749$.

[49] The mindfulness group (Merged) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = .57$, $p =.753$.

Resilience (BRS and CD-RISC). In Year One, resilience was measured using the BRS, which highlighted no significant differences between the control, yoga, and mindfulness groups ($F(2, 112) = 2.46$, $p = .090$, partial $\eta^2 = .042$)[50]. However, when vulnerable adolescents were compared with the rest of the cohort, there were significant differences between the control and intervention groups for the non-vulnerable pupils (Appendix R; $F(2, 66) = .3.99$, $p = .023$, partial $\eta^2 = .108$).). Post-hoc Tukey tests showed that the control group slightly increased, whilst the mindfulness group decreased in resilience scores ($p = .017$). However, this scale was shown to have low internal reliability in the current study (α range $= .61 - .64$), putting the validity of these findings into question.

In Year Two, resilience was measured using the CD-RISC (due to the low internal reliability of the BRS in Year One). This also showed no significant differences between groups on changes in resilience levels ($F(2, 96) = .78$, $p = .464$, partial $\eta^2 = .016$)[51].

Self-Compassion (SCS-C). There were no significant differences between groups on negative self-compassion ($F(2, 101) = .11$, $p = .895$, partial $\eta^2 = .002$)[52]. In contrast, there were significant differences between groups for positive self-compassion, with a medium to large effect size ($F(2, 100) = 6.08$, $p = .003$, partial $\eta^2 = .108$)[53]. Tukey post hoc analyses revealed a significant difference between the control and mindfulness groups ($p = .002$). The control group demonstrated increases in positive self-compassion, whilst participants in the mindfulness group showed reductions in their positive self-compassion.

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[50] The mindfulness group (Yr 1) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = 3.26$, $p = .196$.

[51] The yoga and mindfulness groups (Yr 2) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = 1.08$, p $= .583$.

[52] The mindfulness group (Yr 1) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = .78$, $p = .676$.

[53] The mindfulness group (Yr 1) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = 8.83$, $p = .012$.

When the vulnerable participants were compared to the other participants, there were also significant differences between groups for the other pupils on measures of positive self-compassion (Appendix R; $F(2, 59) = 8.32$, $p = .001$, partial $\eta^2 = .220$). Post-hoc Tukey tests indicated that the control group had significant increases in positive self-compassion, whilst those in the yoga ($p = .007$) and mindfulness group ($p = .001$) demonstrated decreases. This pattern of results suggests that for most pupils with lower levels of stress and higher levels of wellbeing, PSHE-as-usual was more helpful for encouraging positive self-compassion, at least in the short term.

Self-Regulation (ASRI). There were no significant differences between the groups on changes in short-term self-regulation, which was measured in Year Two ($F(2, 97) = .74$, $p = .478$, partial $\eta^2 = .015$)[54].

Sleep (ASWS). There were no significant differences on any of the three sub-scales, including Going to Bed ($F(2, 94) = .05$, $p = .950$, partial $\eta^2 < .001$), Returning to Wakefulness ($F(2, 90) = .66$, $p = .521$, partial $\eta^2 = .014$), or Falling Asleep ($F(2, 93) = .61$, $p = .547$, partial $\eta^2 = .013$) as measured in Year Two.

However, when the sample was broken down further, there were significant differences between conditions on the Falling Asleep subscale for vulnerable adolescents with a large effect size (Appendix R; $F(2, 31) = 4.02$, $p = .028$, partial $\eta^2 = .206$). Post-hoc tests indicated that the mindfulness group had higher scores than the control group ($p = .021$). This suggests that vulnerable pupils in the mindfulness group found it easier to fall asleep after participation in the mindfulness intervention than those in the control group, whose ability to fall asleep declined.

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[54] The control group (Yr 2) violated the assumption of normality. Kruskal Wallis $= \chi^2(2) = 2.27$, $p = .322$.

Table 21.

Descriptive Statistics for Wellbeing Outcome Measures (continued overleaf).

		Control			Yoga			Mindfulness		
		N	*M* change[18]	*SD*	*N*	*M* change	*SD*	*N*	*M* change	*SD*
Wellbeing (WEMWBS)	**Year One**	35	2.60	7.84	35	.80	7.44	41	-.63	10.26
	Year Two	25	-1.76	7.29	40	.40	7.59	37	-1.32	7.89
	Merged	60	.78	7.86	75	.59	7.47	78	-.96	9.16
Stress (PSS)	**Year One**	35	-.80	1.21	38	-1.53	5.87	44	.27	7.45
	Year Two	29	.14	5.66	40	-.65	6.22	39	-.69	5.86
	Merged	64	-.39	6.48	78	-1.08	6.03	83	-.23	6.72
Mindfulness (CAMM)	**Year One**	32	2.56	6.57	30	1.00	4.91	39	.54	6.81
	Year Two	25	.64	7.22	39	-.46	5.82	38	.37	5.80
	Merged	57	.86	7.06	69	-.83	5.50	77	-.26	6.40

		Control			Yoga			Mindfulness		
		N	*M* change[55]	*SD*	*N*	*M* change	*SD*	*N*	*M* change	*SD*
Resilience (BRS and CD-RISC)	**Year One**	36	.29	0.55	37	.07	.52	42	-.04	.82
	Year Two	23	.26	1.76	38	-0.13	2.06	38	-.37	1.85
Self-Compassion (SCS-C) (Year One)	**Positive**	34	2.18	6.10	29	-.62	4.36	40	-1.82	4.33
	Negative	34	.09	5.94	30	.43	3.92	40	-.12	4.59
Self-Regulation (ASRI)	**Year Two**	25	.56	4.93	39	-1.13	5.89	36	.17	6.61
Sleep (ASWS) (Year Two)	**Going to bed**	25	-.32	3.52	38	-.39	3.01	34	-.16	2.89
	Returning to Wakefulness	22	-.95	2.94	38	-.32	3.59	33	.12	3.48
	Falling Asleep	25	-1.68	5.18	38	-1.18	6.65	33	-.30	4.65

[55] Maximum possible changes on each measure: WEMWBS = +/- 56 (+ scores indicate positive change); PSS = +/- 40 (- scores indicate positive change); CAMM = +/- 40 (+ scores indicate positive change); BRS = +/- 4 (+ scores indicate positive change); CD-RISC = +/-8 (+ scores indicate positive change); SCS-C: Positive = +/- 24 (+ scores indicate positive change), Negative = +/- 24 24 (- scores indicate positive change); ASRI = +/-52 (+ scores indicate positive change); ASWS: GB = +/- 15 , RW = +/- 10, FA= +/- 25 (+ scores indicate positive change).

6.2.1.2 Wellbeing: Pre-Post Intervention Session. In Year Two, mood changes within intervention classes were measured using the PANAS (pre-post 45-minute intervention session). Due to violations of normality, Kruskal-Wallis tests were employed to determine any changes in positive and negative mood states. Follow-up Mann-Whitney U tests were conducted to understand differences between groups. The Bonferroni adjusted p-value was $p < .025$, to control for Type 1 errors.

Positive Affect. The distribution of difference scores was statistically significantly different between groups across all three intervention sessions (Table 22). Follow up Mann-Whitney U tests revealed that there were significant differences between the control and yoga group, with medium to large effect sizes (Session 1: $U = 105$, $z = -5.48$, $p < .001$, $r = .67$; Session 2: $U = 68$, $z = -5.29$, $p < .001$, $r = .73$; Session 3: $U = 582.50$, $z = -2.63$, $p = .008$, $r = .29$). There were also significant differences between the control and mindfulness groups, also with medium to large effect sizes (Session 1: $U = 318$, $z = -4.02$, $p < .001$, $r = .45$; Session 2: $U = 82.50$, $z = -6.51$, $p < .001$, $r = .73$; Session 3: $U = 669$, $z = -3.58$, $p < .001$, $r = .37$). These findings indicate that those in the yoga and mindfulness groups demonstrated increases in positive affect after participation in a 45-minute intervention class.

Negative Affect. There were significant differences between the intervention and control groups on negative emotion changes across all three intervention sessions (Table 22). Follow up Mann-Whitney U tests revealed that there were significant differences between the control and yoga group, with medium effect sizes (Session 1: $U = 294.50$, $z = -2.96$, $p = .003$, $r = .36$; Session 2: $U = 209$, $z = -2.62$, $p = .009$, $r = .36$; Session 3: $U = 447.50$, $z = -3.97$, $p < .001$, $r = .44$). There were also significant differences between the control and mindfulness groups on measures of negative emotions, also with medium effect sizes (Session 1: ($U = 419.50$, $z = -2.96$, $p = .003$, $r = .33$; Session 2: $U = 360$, $z =$

-3.53, $p < .001$, $r = .39$; Session 3: $U = 667.50$, $z = -3.62$, $p < .001$, $r = .37$). These findings indicate that those in the yoga and mindfulness groups demonstrated decreases in negative affect after participation in a 45-minute intervention class.

Table 22.

Differences in Positive and Negative Affect after 45-min Intervention or Control Sessions.

		Positive Affect				Negative Affect			
		N	Mean Rank	*M*d	Significance	N	Mean Rank	*M*d	Significance
Session 1 (Week 4)	**Control**	25	29.92	0	($\chi^2(2) = 33.07, p < .001$)	25	81.44	0	($\chi^2(2) = 10.71, p = .005$)
	Yoga	41	80.50*	2		41	55.20*	-1	
	Mindfulness	56	61.69*	1		56	57.22*	-1	
Session 2 (Week 7)	**Control**	25	19.02	0	($\chi^2 (2) = 48.56, p < .001$)	25	73.24	0	($\chi^2(2) = 13.47, p = .001$)
	Yoga	28	58.43*	1		28	52.59*	-1	
	Mindfulness	55	68.63*	1		55	46.95*	-1	
Session 3 (Week 9)	**Control**	42	51.30	0	($\chi^2(2) = 13.30, p = .001$)	42	89.95	0	($\chi^2(2) = 19.01, p < .001$)
	Yoga	41	74.57*	1		41	57.16*	-1	
	Mindfulness	54	78.54*	1		54	61.69*	-1	

Note. * Significantly different from the control group ($p < .025$)

6.2.2 Cognition

In addition to measures of wellbeing, measures designed to explore changes in cognition, specifically working memory, motor speed, sustained attention, visual scanning, and activation and inhibition of rapid responses, were conducted in Year Two. However due to issues with data collection, less than 20% of the control group provided valid data[56]. Consequently, the intervention groups could not be compared with the control group. Instead, only a pre-post intervention analysis for the yoga and mindfulness intervention groups was conducted (without exploration of the group x time interaction). This data met the assumptions of parametric tests and therefore, Paired-Samples T-tests were conducted across the yoga and mindfulness groups to explore any changes post-intervention (see Appendix Q for normality data).

6.2.2.1 Six Letter Cancellation Task. There was a statistically significant increase in SLCT scores from pre- to post-intervention, with a small to medium effect size for the yoga group (t (36) = 2.47, p = .018, d = .41). The mean increase in score was 4.14, with a 95% confidence interval ranging from .74 to 7.53. A similar pattern was observed for the mindfulness intervention group, with a small to medium effect size (t (30) = 2.15, p = .04, d = .39). As in the yoga group, there was a mean increase of 4.10 (95% CI: .21-7.99). The results for both groups are provided in Figure 11.

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[56] This was due to timing issues, where one class did not place the necessary 90 second time limit on the cognitive tasks, which discounted the validity of this data. Additionally, the other control class had a very low matching rate of <50%.

Figure 11.

Pre-Post Intervention Results for the Six Letter Cancellation Task.
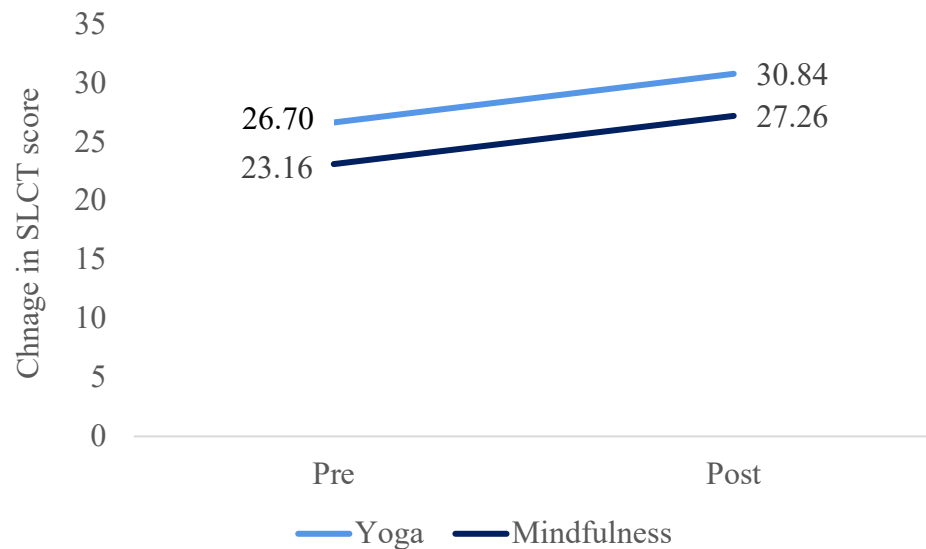
6.2.2.2 Digit Symbol Substitution Test. Participants in the yoga group scored significantly higher on the DSST from pre- to post-intervention. There was a statically significant mean increase of 10.14 (95% CI: 7.13-13.14) with a large effect size (t (36) = 6.85, $p < .001$, $d = 1.13$). For those in the mindfulness intervention, there was a significant increase of 5.91 (95% CI: 2.91-8.91) with a medium to large effect size (t (32) = 4.02, $p < .001$, $d = .70$). The results for both groups are provided in Figure 12.

Figure 12.

Pre-Post Intervention Results for the Digit Symbol Substitution Test.
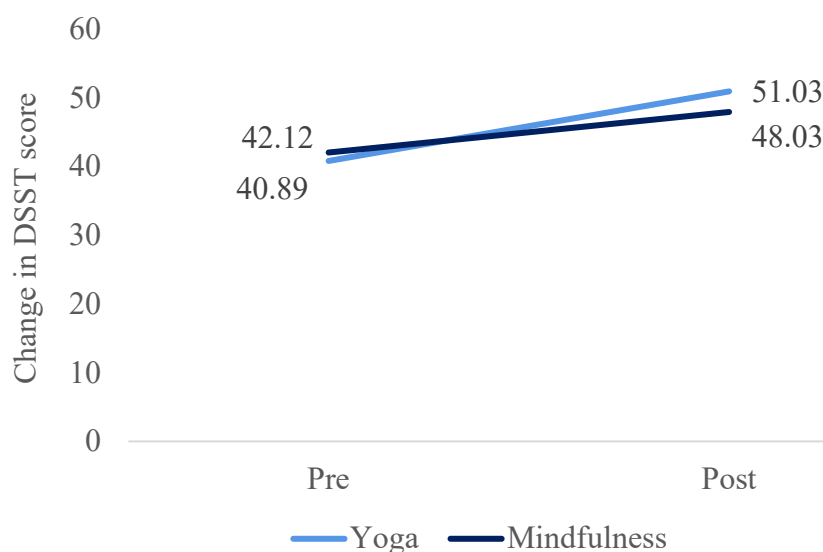
6.2.3 Behaviour

The teacher reported behavioural data was provided at group level, and inferential statistics on the six form classes could not be employed with any reliability given the low number of cases[57,58]. Consequently, only the descriptive statistics are presented for the class totals (Table 23 for positive and Table 24 for negative behavioural points). This data suggests that the yoga and mindfulness intervention groups received substantially more positive behaviour points than the control group. This was true for all sub-categories of the positive behavioural points. When looking at the average total values, both the yoga and mindfulness groups had approximately 20% more positive behavioural points than the control group (yoga: 21% more points; mindfulness: 19% more points). Furthermore, the yoga group had over double the number of positive points for interacting with others,

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[57] Whilst the Kruskal-Wallis statistics should be interpreted with caution, the results are provided for transparency: Positive: Total ($\chi^2(2) = 3.71$, $p = .156$), behaviour points ($\chi^2(2) = 1.14$, $p = .565$), schoolwork ($\chi^2(2) = 3.43$, $p = .180$), interaction with others ($\chi^2(2) = 3.43$, $p = .180$).
[58] Negative: Total ($\chi^2(2) = .29$, $p = .867$), behaviour points ($\chi^2(2) = 0.00$, $p = 1.000$), schoolwork ($\chi^2(2) = 2.00$, $p = .368$), interaction with others ($\chi^2(2) = .86$, $p = .651$). behaviour ($\chi^2(2) = .29$, $p = .876$), uniform concern ($\chi^2(2) = 3.43$, $p = .180$).

whilst the mindfulness group also had 46% more points within this category. These findings suggest that yoga and mindfulness may support the development of skills and attitudes that promote positive behaviours.

Table 23.

Positive Behavioural Data Totals.

	General Points	School Work	Interaction with Others	TOTAL Points
Control	1,111	13,213	512	14,935
Yoga	1,614	15,295	1,196	18,105
Mindfulness	1,278	15,808	746	17,832

Interestingly, there appeared to be a more complex relationship between the intervention and control groups for negative behaviour points. The intervention groups displayed fewer negative points for the sub-categories of general points (unspecified) and interaction with others. However, they received more negative behavioural points on the sub-categories of schoolwork, behaviour, uniform concerns, and the overall totals. Consequently, the behavioural data reveals some interesting differences between the intervention and control groups' positive and negative behaviour points that require further exploration.

Table 24.

Negative Behavioural Data Totals.

	General Points	School Work	Interaction with Others	Poor Behaviour	Uniform Concern	TOTAL Points
Control	-693	-1,477	-650	-1,648	-89	-4,557
Yoga	-607	-2,485	-540	-2,268	-183	-6,083
Mindfulness	-675	-2,178	-460	-1,864	-189	-5,366

6.3 Acceptability of Interventions

Whilst the outcomes data included only those pupils who provided data at both the pre-and post-intervention time points, the acceptability data was analysed using all the post-intervention data set from both years ($n = 299$). The majority of the acceptability variables violated the assumptions of normality and/or homogeneity of variance (Appendix Q). Therefore, a series of Kruskal-Wallis tests were conducted to explore the acceptability of yoga and mindfulness interventions (including enjoyment, helpfulness for managing stress and wellbeing, attitudes towards PSHE teachers, and perceived benefits cited by participants). For results showing a significant difference between groups, follow up Mann-Whitney U tests with a Bonferroni correction were used (adjusted $p < .025$) to control for Type I errors. Additional subgroup analyses comparing Year One and Year Two were also conducted and are reported in Appendix R. In addition to the quantitative analyses, qualitative data from open-response questions were coded thematically to shed further light on adolescents' perceptions of acceptability.

6.3.1 Enjoyment

Participants were asked about the extent to which they enjoyed PSHE sessions (whether this was PSHE-as-usual, yoga, or mindfulness). There was a statistically

significant difference between groups on perceptions of enjoyment ($\chi^2(2) = 9.40$, $p = .009$). Follow up Mann-Whitney U tests revealed that there were only significant differences between the control ($n = 93$, M rank = 85.08) and yoga group ($n = 102$, M rank = 109.78) with a small effect size ($U = 3541.50$, $z = -3.08$, $p = .002$, $r = .22$). See Figure 13.

Figure 13.

Ratings of Enjoyment (Based on a 1-10 Likert Scale).
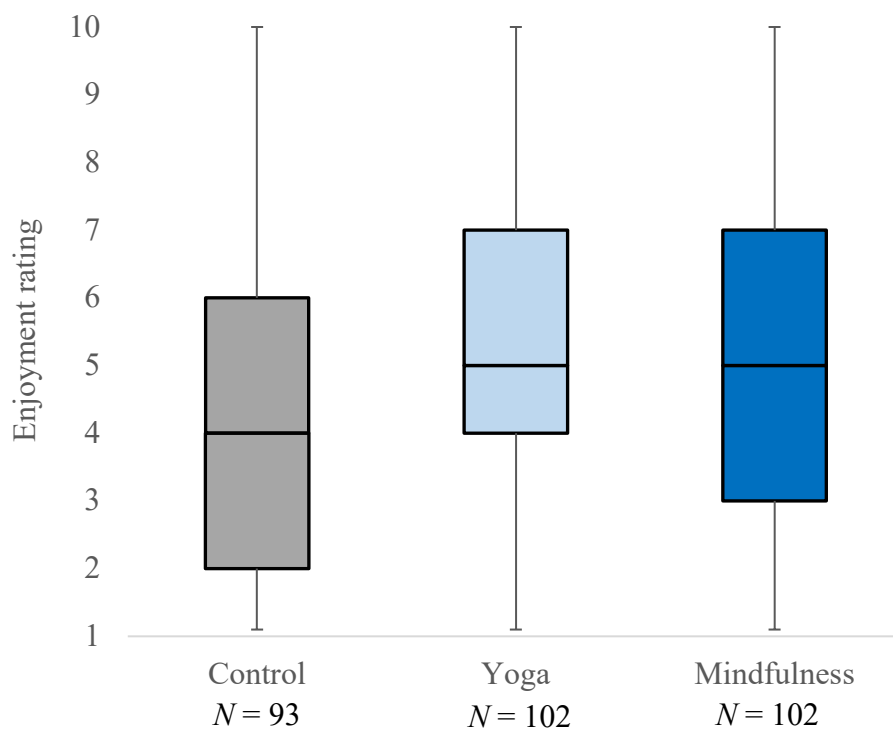
The qualitative data revealed what pupils enjoyed most and least about the yoga and mindfulness sessions. For adolescents taking part in yoga, 75% of participants who responded to the post-intervention survey provided open-response data detailing what they liked most about classes. The majority indicated that the parts of the class that elicited calmness and relaxation were the main source of their enjoyment (67%, $n = 59$). A fifth of participants also cited the physical aspects of the class that sought to increase their fitness and flexibility (20%, $n = 18$), whilst just under a fifth stated that they found the classes interesting for learning new things (16%, $n = 14$). Regarding what participants

liked least, fewer participants responded to this question (46%), and reasons appeared to be more varied. Participants commented that classes were challenging or uncomfortable (43%, $n = 23$), they had negative feelings about specific yoga poses (19%, $n = 10$), found the environment loud or distracting (15%, $n = 8$), disliked the social dynamics within the group (9%, $n = 5$) and found classes repetitive (7%, $n = 4$). Illustrative quotes are provided in Table 25.

Slightly fewer participants in the mindfulness groups proffered responses to the questions regarding what they liked most (66%) and least (39%) about classes. Themes relating to the most liked aspects of mindfulness included various curriculum activities (e.g., breathing and grounding exercises, watching the animations; 55%, $n = 46$), with a specific focus on the mindful eating session (16%, $n = 13$). A third of participants also highlighted the parts of the class that made them feel relaxed and calm (33%, $n = 27$). The main themes identified regarding pupils' least favourite aspects of classes were that sessions were slow, repetitive, and boring (49%, $n = 24$), and disliking certain activities (33%, $n = 16$). Other themes raised included dislike of "everything" (8%, $n = 4$) and the videos and animations used in class (8%, $n = 4$). Illustrative quotes are provided in Table 26.

Table 25.

Yoga Participants' Quotes for Enjoyment of Sessions from Survey Open-Response Questions.

		Illustrative quote
Liked most	**Calm and relaxation**	• *"The time to relax and calm down and take any stress way."* • *"We got to relax at the end of every session."* • *"The relaxing music and it was nice to stretch out all the muscles."*
	Fitness and flexibility	• *"I got to stretch my body."* • *"I liked the yoga classes and most importantly the fitness and the activities as well."* • *"Sun salutation."*
	Learning new and interesting things	• *"Some of the things were interesting and fun."* • *"Yoga positions – I find them interesting and fun."* • *"Got to do something new."*
Liked least	**Challenging or uncomfortable**	• *"I didn't like the hard positions."* • *"It was hard to do some poses."* • *"Some of the actions would hurt my back."*
	Dislike specific yoga poses	• *"I didn't like some of the moves like downward dog."* • *"The balance and some of the stretches."*
	Distracting environment	• *"There was lots of talking in the class."* • *"The environment was noisy."* • *"With so many children in such a small room it's hard to focus."*
	Social dynamics	• *"I didn't like the group work."* • *"The people I was with – none of my close friends were there so it was weird and awkward."*
	Repetitive or boring	• *"We had to do the same moves every week."* • *"We did the same things over and over again."* • *"It was repetitive."*

Table 26.

Mindfulness Participants' Quotes for Enjoyment of Sessions from Survey Open-Response Questions.

|		Illustrative quote
Liked most	**Various activities**	• *"There were many fun activities in the lessons."* • *"The teacher played games and gave us demonstrations so we could learn in depth."* • *"I learnt a lot and sometimes there were enjoyable tasks, and I really enjoyed the videos that explained what was going on."*
	Mindful eating	• *"I liked the chocolate and when we were doing the practices."* • *"I liked the food techniques."* • *"There was always lots to do, and some activities involved food."*
	Relaxation and stress relief	• *"I enjoyed how we got time in school to meditate quietly."* • *"I liked learning how to deal with stress and the different ways to manage it."* • *"Learning about controlling your mind and emotions."*
Liked least	**Slow, repetitive, and boring**	• *"How slow everything was. It bored half of us. I tried to keep learning, but everything was so slow."* • *"Sometimes I found the sessions boring, and I didn't learn anything."* • *"The teacher was too slow, and it was sometimes boring."*
	Dislike of activities	• *"I disliked the writing activities."* • *"I didn't like lying down on the floor."* • *"I did not like the constant talking and I was never picked when I put my hand up."*
	Everything	• *"Everything about the classes."* • *"It was something I won't use in my life so was useless."* • *"The work."*
	Videos / animations	• *"I didn't like the animations because it didn't really help me to understand what we were learning about."* • *"How we watched loads of videos but didn't actually try the things in the videos."*

6.3.2 Managing Stress and Wellbeing

Participants were asked about the extent to which they perceived PSHE sessions (whether this was PSHE-as-usual, yoga, or mindfulness) to be helpful for supporting them to manage their stress and wellbeing. There was a statistically significant difference between groups in pupils' perceptions of classes as being helpful for managing their stress and wellbeing ($\chi^2(2) = 10.44$, $p = .005$). Follow-up Mann-Whitney U tests showed that those in the yoga ($n = 101$, M rank $= 108.20$; $U = 3414$, $z = -3.102$, $p = .002$, $r = .20$) and mindfulness groups ($n = 102$, M rank $= 106.02$, $U = 3720$, $z = -2.397$, $p = .017$, $r = .17$) had more positive perceptions, in comparison to the control group ($n = 91$, Yoga comparison M rank $= 83.52$; Mindfulness comparison M rank $= 86.88$), with a small effect size. These results highlight that participants in the yoga and mindfulness groups perceived the interventions to be more useful for supporting them to manage their stress and wellbeing in comparison to PSHE as usual (see Figure 14).

Figure 14.

Helpfulness for Managing stress and wellbeing (based on a 1-10 Likert Scale).
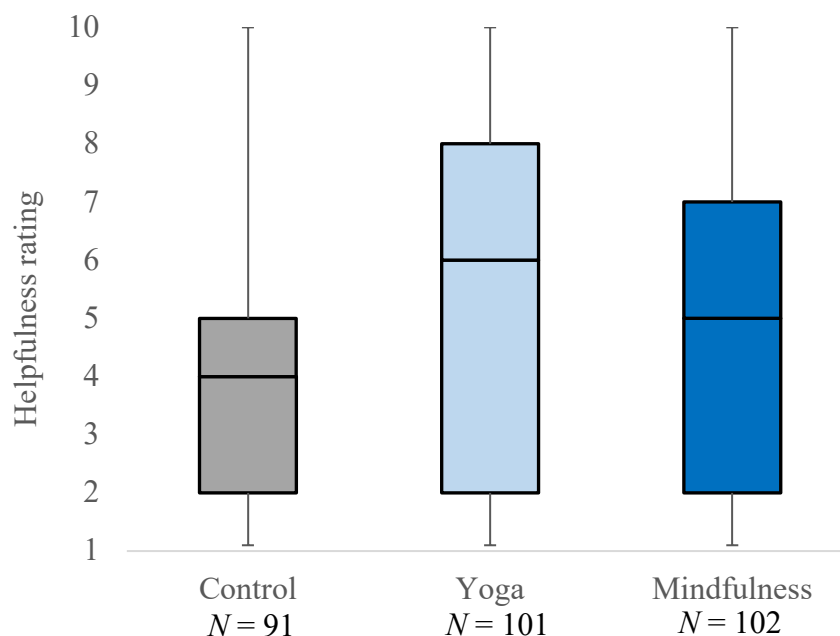
6.3.3 Attitudes Towards PSHE Teachers

Participants were asked to rate the teacher who led their PSHE session (whether this was their usual schoolteacher or yoga/mindfulness facilitator). There was a statistically significant difference between groups in feelings towards their schoolteacher (control group) or intervention facilitator (intervention groups) ($\chi^2(2) = 25.62$, $p < .001$). Follow up tests revealed that there was a significant difference between the control ($n = 94$, M rank = 78.47) and yoga group ($n = 100$, M rank = 115.39), with a medium effect size ($U = 2911$, $z = -4.62$, $p < .001$, $r = .33$). There were also significant differences between the control ($n = 94$, M rank = 81.20) and the mindfulness group ($n = 102$, M rank = 114.44), with a medium effect size ($U = 3158$, $z = -4.13$, $p < .001$, $r = .30$). These results indicate that participants in both intervention groups rated their intervention facilitators more highly than those in the control group who were taught by their usual form teacher (Figure 15). These findings point to the acceptability of external facilitators coming into schools to deliver mind-body interventions, whereby pupils liked rated them more highly than existing members of school staff delivering PSHE sessions.

Figure 15.

Attitudes Towards PSHE Teacher (Based on a 1-10 Likert Scale).
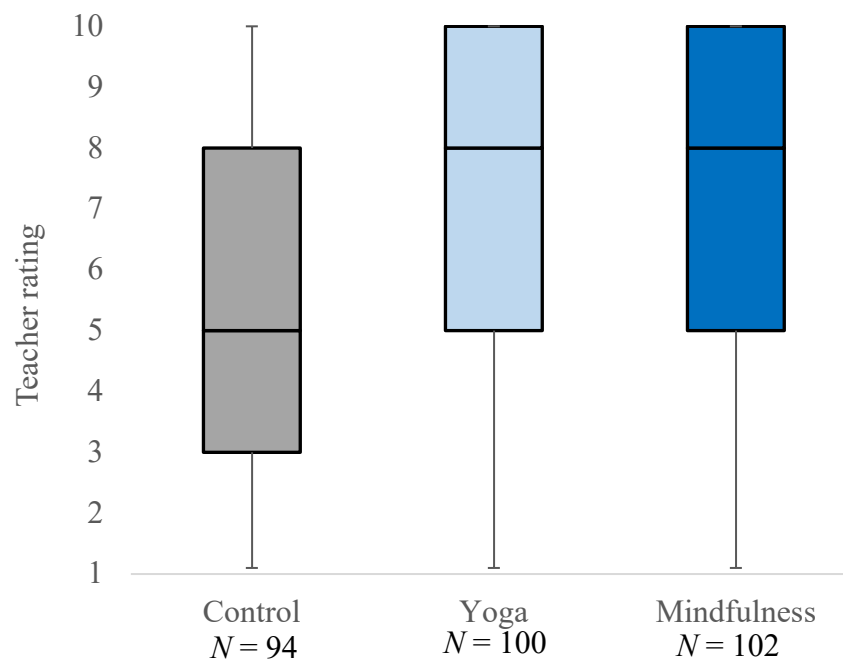
Given pupils rated intervention facilitators delivering PSHE sessions more highly than existing school staff delivering sessions, these findings were explored further using Spearman's rank-order correlation analyses for each condition. For all three groups, there were significant positive correlations between pupils' attitudes towards the PSHE teacher and other acceptability measures (Table 27). These correlations indicated that, as the ratings of the teacher/facilitator increased, so did intervention acceptability in all three groups. Whilst the correlation coefficients for each group were not significantly different from each other (as measured by Fishers r to z transformation; Appendix R), the strength of the correlations were much stronger in the yoga and mindfulness intervention groups.

For the yoga group, the findings indicate that adolescents' attitudes towards the intervention facilitator explained 26% of the variance in enjoyment[59] and 20% of the variance for managing stress and wellbeing. Similarly, for the mindfulness group, pupils' attitude toward the facilitator explained 29% of the variance for enjoyment and 18% of the variance in managing stress and wellbeing. Whilst these findings are not an indication of causality, they do indicate the importance of the facilitator in the overall acceptability of school-based interventions.

The importance of the facilitator was further demonstrated when comparing Year One and Year Two (Appendix R). There were significant differences between the years for the mindfulness group on measures of acceptability. However, when the lowest-rated intervention facilitator was removed from the analysis, these differences were also reduced, indicating the facilitators importance in pupils' overall experiences.

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[59] Variance explained (R^2) was calculated by squaring the correlation coefficient and multiplying by 100.

Table 27.

Spearman's Rank-Order Correlation Coefficients: Attitudes Towards PSHE Teacher.

		Enjoyment	**Managing Stress and Wellbeing**
Attitudes towards Teacher	**Control**	.451**	.293*
	Yoga	.514**	.451**
	Mindfulness	.541**	.424**

Note. * $p < .01$ level (two-tailed) ** $p < .001$ level (two-tailed)

6.3.4 Perceived Benefits of Interventions

There was a statistically significant difference in the number of benefits participants reported across the different groups ($\chi^2(2) = 26.95$, $p < .001$). Post-hoc tests revealed significant differences between the control ($n = 116$, M rank = 91.81) and yoga group ($n = 106$, M rank = 133.05, $U = 3864$, $z = -4.929$, $p < .001$, $r = .33$), and between the control ($n = 116$, M rank = 97.83) and mindfulness group ($n = 112$, M rank = 131.76; $U = 4562.50$, $z = -4.05$, $p < .001$, $r = .33$); both with medium effect sizes. These findings show that participants in the yoga and mindfulness intervention groups cited an increased number of benefits in comparison to participants in the control group (Figure 16).

Figure 16.

Number of Pupil Reported Perceived Benefits.
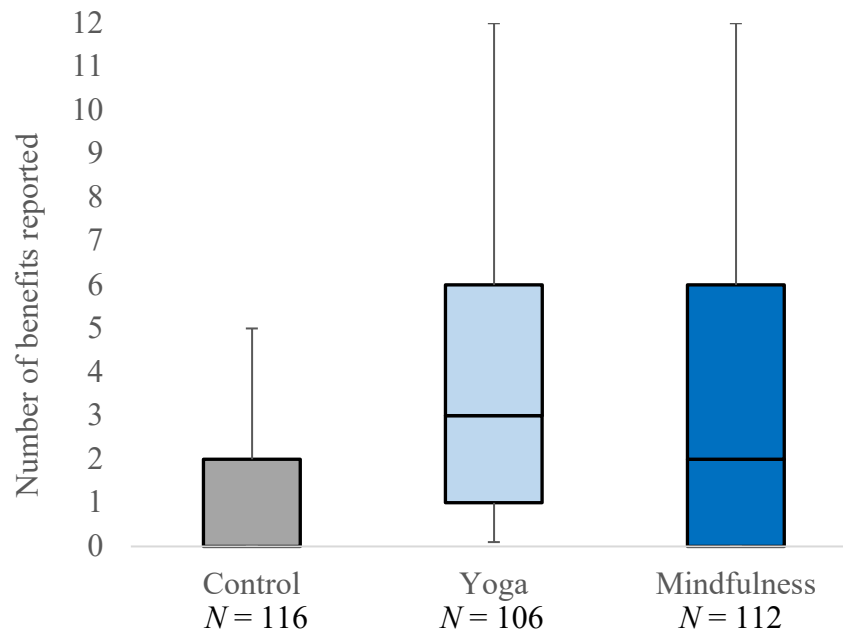
Spearman's rank-order correlation analyses were also employed to explore any correlation between the number of perceived benefits reported and the acceptability of the interventions. The results indicated significant positive correlations between the number of perceived benefits and acceptability for all three conditions (Table 28). However, the strength of the correlation was much stronger in the yoga and mindfulness intervention groups than in the control group. An analysis of the differences between the correlation coefficients found that the strength of the correlations between the intervention groups and control group were significantly different (as measured by Fishers *r* to *z* transformation; Appendix R).

For the yoga group, the findings indicate that acceptability measures explained between 27% (managing stress and wellbeing) and 10% (attitudes towards the facilitator) of the variance in the number of reported benefits. For the mindfulness group, between 40% (managing stress and wellbeing) and 21% (attitudes towards the facilitator) of the variance in the number of benefits was explained by acceptability measures. Despite not being evidence of causality, this pattern of results indicates a significant relationship

between measures of acceptability and the subsequent benefits reported. The results show a particularly strong correlation for both intervention groups between perceptions of helpfulness of the interventions for managing stress and wellbeing and the number of benefits reported, suggesting the skills learnt in class were useful to pupils.

Table 28.

Spearman's Rank-Order Correlation Coefficients: Number of Perceived Benefits.

		Attitudes towards PSHE Teacher	**Enjoyment**	**Managing Stress and Wellbeing**
Number of Perceived Benefits	**Control**	.234*	.169	.381**
	Yoga	.315*	.509**	.520**
	Mindfulness	.457**	.460**	.634**

Note. * $p < .01$ level (two-tailed) ** $p < .001$ level (two-tailed)

In addition to the overall number of benefits cited, the differences for each individual benefit were further explored to understand any differences between groups. Due to the categorical nature of the data (categories: yes/no), a series of non-parametric Chi-square tests for independence were conducted and Cramer's V was employed to estimate the effect size. Where these associations were significant, column proportion tests (with Bonferroni correction: adjusted $p = .025$) were employed to further shed light on where the differences between groups lay, as Sharpe (2015) recommended to control for Type I errors. The results from the Chi-square tests are presented in Table 29.

The analyses indicated significant associations between condition and concentration, ability to cope with stress, and perceptions of exams, all with a medium effect size. Column proportion tests revealed that for all three measures, there were significant differences between the control and mindfulness groups only ($p < .025$). These findings suggest that participants in the mindfulness group were more likely to report that the intervention helped them concentrate, cope with stress, and perform better on tests or

exams than the control group. Whilst not significant, the number of participants in the yoga group reporting these benefits was substantially higher than those in the control group, suggesting an overall trend in increases in these measures for the intervention groups.

This trend was observed for the measures of coping with feelings of sadness, helping with sport, calmness and relaxation, dealing with anger, helping with sleep, and feelings of connection and spirituality. Across these benefits, there were medium to large effect sizes. Column proportions tests highlighted that participants in both the yoga and mindfulness groups were significantly more likely to report benefits across all of these measures than participants in the control group. Taken together, these results suggest that, at least based on self-report, both yoga and mindfulness support adolescents more than their regular PSHE class in managing negative and reactive emotions, inducing states of calmness and relaxation, supporting better sleep hygiene, supporting connection and/or spirituality, and aiding sports-related hobbies (Table 29).

Table 29.

Perceived Benefits Cited by Participants.

	Control		Yoga		Mindfulness		Significance
	N	% within condition	*N*	% within condition	*N*	% within condition	
Anger	16	30%	31	48%	42	66%	χ^2 (2) = 15.19, *p* = .001, Cramer's V = .29*
Better performance on tests and exams	16	29%	24	41%	35	60%	χ^2 (2) = 11.87, *p* = .003, Cramer's V = .26*
Calmness and relaxation	23	40%	61	75%	50	70%	χ^2 (2) = 19.63, *p* < .001, Cramer's V = .31*
Concentration	26	45%	41	66%	46	67%	χ^2 (2) = 7.79, *p* = .020, Cramer's V = .20*
Connection and Spirituality	9	16%	23	40%	25	44%	χ^2 (2) = 10.98, *p* = .004, Cramer's V = .25*
Coping with feeling sad	8	15%	21	37%	24	42%	χ^2 (2) = 10.29, *p* = .006, Cramer's V = .25*
Coping with stress, anxiety, and worries	16	29%	28	47%	38	58%	χ^2 (2) = 10.91, *p* = .004, Cramer's V = .25*
Feeling happier and more fulfilled	19	33%	25	43%	30	50%	χ^2 (2) = 3.35 *p* = .187, Cramer's V = .14
Getting on better with others	20	36%	20	38%	30	48%	χ^2 (2) = 2.18, *p* = .336, Cramer's V = .11
Helping with sport	8	15%	34	56%	20	36%	χ^2 (2) = 20.70, *p* < .001, Cramer's V = .35*
Improved sleep	5	10%	34	54%	27	46%	χ^2 (2) = 26.13, *p* < .001, Cramer's V = .29*
Speaking in front of others	17	31%	19	35%	25	43%	χ^2 (2) = 1.71, *p* = .425, Cramer's V = .10

Note. * Significant difference between groups (*p* < .05).

In addition to the quantitative data, participants were also asked to elaborate on the benefits they experienced through open response questions within the post-intervention survey. From the 28% ($n = 33$) of yoga participants who provided a response, the most frequently cited benefits concerned relaxation (58%, $n = 19$), positivity and confidence (21%, $n = 7$), and fitness and flexibility (12%, $n = 4$). Of the 29% ($n = 36$) of those in the mindfulness group who provided a response, similar benefits were described for coping with stress (67%, $n = 24$), cultivating positivity and confidence (22%, $n = 8$), and interacting with others (11%, $n = 4$). Illustrative quotes from both the yoga and mindfulness groups are provided in Table 30.

Table 30.

Participant Quotes for Perceived Benefits from Survey Open-Response Questions.

	Yoga	**Mindfulness**
Relaxation and coping with stress	• *"If I am upset, I can practise yoga techniques and it calms me down and relieves any stress away."* • *"I now have methods to relax myself."* • *"I can push away stress and anxiety."*	• *"I learnt how to stay calm during the hard/stressful times."* • *"It's really calming and easier for me to rest than before."* • *"It helped me whenever I get angry or stressed out."*
Positivity and confidence	• *"I am feeling more confident and positive about myself."* • *"It helped me clear my thoughts and helped me understand and interpret my thoughts in a good way."*	• *"It made me more confident."* • *"It helps me to think positive."* • *"I feel more happy and cheerful."*
Fitness and flexibility	• *"My leg pain has subsided."* • *"It's helped to loosen up my joints."* • *"I'm less tired."*	-
Interaction with others	-	• *"Helps me gain more friends."* • *Helps me to get along with everyone."* • *"Being able to be friends with people I pushed away before."*

6.4 Discussion

The quantitative data showed a varied and complex picture of the potential impact of yoga and mindfulness interventions on adolescents' wellbeing, cognition, and behaviour. Adolescents reported enjoying sessions, finding sessions useful, and held positive perceptions of their intervention facilitator. As a result, they reported a range of benefits in comparison to PSHE classes. Moreover, those in both the yoga and mindfulness intervention groups showed positive mood increases and negative mood decreases after intervention sessions. Furthermore, there was suggestive evidence of the cognitive and attention-related benefits for those in the yoga and mindfulness groups. However, despite suggestions of benefits for the wellbeing of adolescents, the validated measures of stress, mindfulness, resilience, negative self-compassion, self-regulation, and sleep did not reveal significant differences between the intervention and control groups.

6.4.1 Impact on Wellbeing

Adolescents in the intervention groups reported a range of perceived benefits after participation in the interventions. Those in both the yoga and mindfulness interventions were more likely to report that interventions had helped them cope with feelings of sadness, facilitated calmness and relaxation, helped them to deal with anger and sleep, and supported feelings of connection and spirituality. Despite these perceived benefits, no measurable changes were found for the full cohort of adolescents' levels of wellbeing, stress, mindfulness, resilience, self-regulation, or sleep, on the validated measures after participation in the ten-week interventions, in comparison to the control group.

Whilst there is an abundance of evidence to highlight the wellbeing benefits of yoga (Ferreira-Vorkapic et al., 2015; Miller et al., 2020; Serwacki & Cook-Cottone, 2012) and mindfulness (Kallapiran et al., 2015; Klingbeil, Renshaw, et al., 2017; McKeering & Hwang, 2019; Sapthiang et al., 2019; Zenner et al., 2014), not all studies

have demonstrated observable benefits. A recent systematic review of school-based MBIs has highlighted a number of studies that have not shown positive effects of mindfulness (McKeering & Hwang, 2019). Research conducted by Johnson, Burke, Brinkman, and Wade (2016, 2017) and Quach et al. (2016) observed no significant changes after school-based mindfulness on measures of depression, anxiety, wellbeing, mindfulness, or self-compassion. This pattern of results has also been observed in the yoga literature. Haden, Daly, and Hagins (2014) found no significant changes on measures of positive affect, self-worth, aggression, or internalizing/externalizing problems. Thus, the findings observed in the current study are consistent with a subset of past literature, which has not observed measurable differences in wellbeing. Researchers who have observed non-significant effects have put forward many explanations for this pattern of findings, which may also be relevant within the current study. These may include the short-term negative impact of increased awareness and the specific age group of the sample. In addition to these proposed mitigating factors, other possible explanations for this pattern of findings include the effect of the intervention dosage and the status of the intervention facilitator (see Chapter 10, Section 10.2).

Regarding the negative impact of increased awareness, there were significant differences on measures of positive self-compassion in Year One that indicated that the control group demonstrated increases in positive self-compassion, whilst participants in the mindfulness group showed reductions. Sub-group analyses for the most vulnerable pupils revealed further differences in positive self-compassion between the control group and intervention groups for non-vulnerable pupils, with decreases for the intervention groups. These sub-group analyses also showed significant differences for non-vulnerable pupils for their levels of mindfulness; the 'other' pupils in the control group became more mindful, whilst those in the mindfulness group saw their mindfulness skills decrease.

Whilst these may initially appear as unexpected findings, it may be that mind-body interventions serve to increase self-awareness for some adolescents (at least in the short-term), which could, in turn, lead to increased awareness of negative emotions. As suggested by White (2012), both yoga and mindfulness interventions aim to increase awareness of stress and stress responses, encouraging more adaptive coping strategies. Subsequently, it could be argued that increases in awareness could heighten attentiveness to stressors in adolescents' everyday lives. This may be particularly pertinent within the current sample, given the deprivation of the local area. In comparison to children from better family environments, individuals from low SES environments are more frequently exposed to stressful life events (Evans & Kim, 2010; He & Yin, 2016; Kim et al., 2013), consistent with the Family Stress Model. Therefore, it is reasonable to conclude that stressors within this population may be particularly acute, and, subsequently, awareness of stressors may not necessarily be a positive change. Supporting this, Tharaldsen et al. (2011) noted that awareness enhancing interventions might be most beneficial for individuals with minimal perceived life strains as it is easier to be aware of situations when these are not extreme or overwhelming. Thus, this raises questions about the appropriateness of yoga and mindfulness interventions within this context. Nevertheless, adolescents *perceived* the interventions to be helpful for managing their stress and wellbeing, which contrasts with these findings. Consequently, there appears to be a nuanced pattern of findings where adolescents felt more able to manage their stress but also were also more acutely aware of stressors, which could be a negative outcome.

In addition to the potential negative impact of increased awareness, the age of the adolescents may also have contributed to the findings. A recent meta-analysis found that mindfulness-based interventions were more effective in late adolescence (ages 15-18 years) in comparison to younger age groups (6-10 years; Carsley et al., 2018). The meta-analysis found no significant changes after mindfulness interventions for those in the 11-

14-year-old age bracket. The limited effectiveness of interventions within this age group was not limited to yoga and mindfulness, but also bullying (Yeager, Fong, Lee, & Espelage, 2015) and general school-based health interventions (Yeager, Dahl, & Dweck, 2018). Given the sample in the current study fell within this age bracket, these results may be considered consistent with age-specific evidence and may be due to the developmental characteristics of early adolescence as a phase of heightened self-consciousness, characterised by peer and self-judgment (Bluth & Blanton, 2014; Neff & McGehee, 2010).

Consequently, the combination of the specific adolescent developmental period, alongside a simultaneous increase in stress awareness, may be particularly problematic for early adolescents who may lack the cognitive and emotional maturity to effectively cope with problems once they are fully aware of them (White, 2012). Therefore, increased awareness may lead to more critical or negative views of the self, others, and/or situations. Whilst the findings in the current study did not find any significant deterioration in wellbeing (and instead found *perceived* increases in stress responses), consideration of developmental trajectory may help interpretation of the non-significant findings on the validated measures of wellbeing.

6.4.2 Impact on Short-Term Mood

When looking at changes in mood after participation in the 45-minute intervention classes, those in the yoga and mindfulness groups showed increases in positive emotions and decreases in negative emotions, in comparison to the control group. Thus, both interventions appeared to positively affect the mood and wellbeing of adolescents in the short term. To date, most previous research has only explored changes in mood after the duration of the intervention programme (as opposed to pre-post session). However, these findings can be considered consistent with past research that has observed decreases in

negative affect after participation in short-term mind-body interventions (Bluth et al., 2016; Noggle et al., 2012; Sibinga et al., 2016; Vickery & Dorjee, 2016; West et al., 2004). Adopting a similar approach of exploring any changes in mood after a single yoga class, Felver et al. (2015) also showed decreases in negative affect after participation, however, these changes were not significant between conditions. Therefore, the current study has demonstrated significant reductions in negative mood and affect when comparing yoga and mindfulness interventions to a control group. Furthermore, the current study is relatively unique in finding increases in adolescents' positive affect, which have not been observed as frequently within the literature. Schonert-Reichl and Lawlor (2010) observed an increase in positive affect pre-post intervention for the mindfulness group; however, the changes were not significant in comparison to a control group. Similarly, Britton et al. (2014) also observed increases in positive affect with small to medium effect sizes, but these were not statistically significant compared to the control group. Thus, the significant increase in positive affect observed in the current study compared to a control group is noteworthy and extends the evidence base for mood-related impacts.

In order to account for these affect changes, it has been hypothesised that contemplative practices, such as those included in yoga and mindfulness interventions, influence cognitive and emotional processes. Indeed, through the regular practice of constantly re-directing attention to a particular sensory experience (e.g., to the breath), it has been suggested that cognitive regulatory abilities are enhanced (Bishop et al., 2004; Shapiro et al., 2006). This process hypothesises that individuals cultivate skills to disengage attention (potentially from negative thoughts and experiences) and re-engage attention on different, potentially more positive, stimuli (Davidson et al., 2012; Felver et al., 2015). Increased awareness on positive affective states may, in turn, advantageously affect wellbeing. Therefore, a balance between positive and negative affect is necessitated

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for hedonic wellbeing. In support of this, a high PA to NA ratio correlated with better mental health across the lifespan (Diehl et al., 2011). This may be particularly important for the vulnerable sample of adolescents in the current study. Indeed, compared with children from high SES, individuals from low SES environments are more likely to experience NA, which may translate into greater likelihood of emotional disorders (Gallo & Matthews, 2003). Therefore, a better PA to NA ratio may act as a protective buffer for adolescents in deprived communities.

Whilst any increase in positive affect (or decrease in negative affect) can be considered a benefit, in practice it is unclear how long these affective changes were sustained. The results show that these changes were not sustained long enough to effect wellbeing or positive emotions on a more long-term basis (as indicated by the limited changes on pre-post ten-week intervention wellbeing measures). It may be that intervention sessions helped encourage adolescents to re-direct attention to positive affect in and directly after sessions. However, the stress of adolescents' school and home lives may have undermined sustainability beyond the intervention classroom, highlighting the relevance of intervention dosage to enable meaningful and long-lasting change.

6.4.3 Impact on Cognition

In addition to wellbeing measures, cognitive measures were also explored to find significant improvements for the yoga and mindfulness groups on attention, inhibition, focus, visual scanning, and working memory, as measured by the Six Letter Cancellation Task and Digit Symbol Substitution Test. This suggests that yoga and mindfulness can improve the cognitive functioning of adolescents, which may positively impact educational engagement and attainment. However, given the lack of a control group, these findings should be interpreted with caution.

Nevertheless, past research has also suggested cognitive benefits for adolescents after participation in mind-body interventions. A systematic review focusing on yoga studies in schools found improvements for children and adolescents' attentional regulation, attentional control, and cognitive efficiency (Serwacki & Cook-Cottone, 2012). Similarly, some of the strongest effect sizes for mindfulness interventions in schools were found for cognitive measures (Zenner et al., 2014). These improvements across a range of cognitive functions may be due to learning key concepts within mind-body interventions; namely, the constant redirecting or shifting of attention to the present moment alongside the inhibition of both internal and external distractions. Subsequently, mind-body interventions teach self-regulatory top-down cognitive processes and give individuals an opportunity to practice these skills during sessions, whilst lowering of the intensity of bottom-up factors (e.g., stress and anxiety) (Janz et al., 2019; Miller et al., 2020; Park et al., 2014; Schmalzl et al., 2015; Zelazo & Lyons, 2012). Therefore, whilst the current study was not able to compare the intervention groups to a control group, there is strong evidence to support the positive cognitive changes after participation in yoga and mindfulness interventions.

Increases in cognitive functioning are particularly positive given that lower executive functioning skills are associated with reduced socio-emotional adjustment and academic performance (Biederman et al., 2004; Blair, 2002). Children with lower levels of inhibition at the ages of 3-11 years had poorer physical and mental health, earned less money, were less happy, and engaged in more criminal activity thirty years later, in comparison to those with better inhibitory skills (Moffitt et al., 2011). This remained true after controlling for a range of demographic and socio-economic factors including gender, IQ, social class, and family context. As such, the potential of yoga and mindfulness interventions to increase cognitive functioning may support adolescents to live healthy and fulfilling lives.

6.4.4 Impact on Behaviour

Similar to the cognitive impacts, there were cautiously optimistic findings on the teacher reported behavioural data, which showed that adolescents in the intervention groups received more positive behaviour points than the control group. However, no inferential statistics could be conducted on this data as it was only provided at group-level. Subsequently, this data should be interpreted with caution. Nevertheless, this finding is consistent with previous research that has suggested improvements in behaviour through decreases in aggression and impulsivity after participation in mind-body interventions (Franco et al., 2016). Impulsivity, in particular, is associated with anti-social behaviour during adolescence; those who were not able to delay gratification were motivated by emotions with limited advance thinking, which dictated their actions and behaviours (Franco et al., 2016; Orue et al., 2016).

Increases in self-regulation of emotions and behaviours may be integral in explaining the impact on adolescents' behaviour, which is consistent with previous research (Bergen-Cico et al., 2015; Daly et al., 2015; Khalsa et al., 2012; Metz et al., 2013; Schonert-Reichl et al., 2015; Semple et al., 2005; White, 2012). Therefore, to achieve improvements in behaviours, adolescents must first develop an awareness of their individual thoughts, feelings, and behaviours and secondly, develop the ability (through various coping strategies learnt in intervention sessions) to internally regulate and adapt these for the school context (Butzer et al., 2016). This capacity to internally regulate emotions and behaviours is associated with additional socio-emotional competencies, including social awareness and interpersonal skills (Butzer et al., 2016; Flook et al., 2015; Frank et al., 2014). Improvements across the domains of self-regulation and behaviour may be significant in having long-lasting effects. Research has found that improvements in self-regulation and self-control were associated with reduced mental health problems

and improvements in life (de Ridder et al., 2012; Menezes et al., 2015; Moffitt et al., 2011; Robson et al., 2020; Smithers et al., 2018).

Despite these preliminary findings echoing past research, it should be highlighted that school staff were not blinded to group assignment. Consequently, they may have subconsciously biased their allocation of behaviour points. Indeed, school staff who believed that mind-body interventions could be beneficial might have inadvertently given more positive behaviour points to the intervention groups. However, this seems unlikely, as adolescents in these groups also received more negative behaviour points on some categories, such as schoolwork, behaviour, and uniform concerns.

6.4.5 Acceptability of Yoga and Mindfulness Interventions

In addition to exploring the impact of yoga and mindfulness interventions, the current study also examined the acceptability of these interventions for adolescents in a UK-based school setting. The findings pointed to the strong acceptability of these interventions for adolescents. In comparison to the control group, pupils who participated in yoga intervention sessions reported significantly higher enjoyment, whilst both intervention groups reported higher utility of yoga and mindfulness for managing stress and wellbeing, and more positive attitudes towards their PSHE teacher. This suggests that adolescents considered yoga and mindfulness as more beneficial than PSHE as usual.

These findings are in line with previous school-based yoga and mindfulness literature. However, there are important and novel differences, where the current study extends the available literature. Within the yoga field, numerous studies have highlighted the acceptability of yoga interventions for children and adolescents (e.g., Bergen-Cico et al., 2015; Daly et al., 2015; Felver et al., 2015; Frank et al., 2014; Khalsa et al., 2012; Noggle et al., 2012). However, the previous research was primarily conducted in the US. A growing body of research has also pointed to the acceptability of mindfulness

interventions for children and adolescents (e.g., Lau & Hue, 2011; Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al., 2015; Sibinga et al., 2013). However, in contrast to the yoga literature, there has been a particular growth in the UK of the .b mindfulness programme, which has been shown to be acceptable to adolescents in the UK (Hennelly, 2011; Huppert & Johnson, 2010; Kempson, 2013; Kuyken et al., 2013; McGeechan et al., 2016, 2019) and internationally (Johnson et al., 2016, 2017; Volanen et al., 2015). Whilst the current research findings are consistent with the .b literature, only a minority of mindfulness programmes were delivered universally. Instead, pupils were generally selected for a particular need or vulnerability (e.g., McGeechan et al., 2016; McGeechan et al., 2019). The exception to this is the non-RCT conducted by Kuyken et al. (2013), which was reported to adopt a universal delivery method; however, most schools within the sample were fee-paying schools. Thus, the current study extends the literature as it is the first known study to show that yoga and mindfulness were acceptable to pupils attending mainstream schools in deprived areas of the UK; arguably where yoga and mindfulness could benefit pupils the most.

The current study highlighted the particular importance of the intervention facilitator in influencing adolescents' experiences of the interventions. Ratings of the (external) intervention facilitators were strongly correlated with other aspects of acceptability and explained up to a third of the variance in pupils' enjoyment ratings. The qualitative data provided by pupils provides some context to the high ratings (see Chapter 7, Section 7.2.2). This finding is particularly interesting as there is debate in the literature regarding the optimal way to implement and deliver yoga and mindfulness classes, particularly with regard to the status of the facilitator as external (hired by the school to deliver interventions) or internal (an existing member of school staff trained to deliver interventions; see Chapter 10, Section 10.2.3).

6.5 Conclusion

The quantitative impact evaluation has demonstrated acceptability of school-based yoga and mindfulness interventions with adolescents in an area of high deprivation in a mainstream UK secondary school, delivered in a universal way. In doing so, the current study expands upon the existing literature, contributing a UK-based perspective, highlighting international acceptability of school-based wellbeing interventions. Alongside acceptability, the current research has evidenced short-term mood improvements, cognitive benefits, and potential behavioural improvements following participation, consistent with and extending previous research. Such evidence points to some vital benefits, especially in a sample considered vulnerable or at-risk. Indeed, supporting the development of adaptive psychological, cognitive, and behavioural capacities among vulnerable adolescents has the potential to promote a range of positive outcomes in both the short and long term.

Additionally, the current study has further contributed to several debates regarding the various factors implicated in the non-significant findings across a range of wellbeing measures from pre to post intervention, compared with a control group. These include the potential negative impact of raising awareness of stressors and the age of the adolescent sample. Moreover, wider debates consider the appropriate dosage of mind-body interventions and the role of the facilitator (see Chapter 10, Section 10.2). To further contextualise these quantitative findings and shed light on some of the reasons for effectiveness (or lack of), Chapter 7 reports on the accounts of adolescents, whilst Chapter 8 reports on the accounts of professionals. This data is integrated in Chapter 9 to triangulate the findings through a convergence coding matrix.

7. Qualitative Findings: Pupils' Experiences and Perceived Benefits of Yoga and Mindfulness Interventions

7.1 Overview of Chapter

This chapter presents the impact evaluation focusing on the qualitative research findings from interviews with adolescents who participated in yoga and mindfulness interventions. The data was generated from semi-structured group interviews with 45 adolescents over Year 1 and Year 2, which have been integrated to understand how adolescents experienced the interventions, alongside any potential benefits. The main themes identified in the qualitative data are presented, using illustrative quotes, to ground the themes in the data. To contextualise adolescents' accounts, the findings are integrated with previous literature.

7.2 Findings

As outlined in Chapter 4, Section 4.3.4, the current study adopted an inductive approach to data analysis, whereby the themes were not preconceived and were strongly linked to the content of the data itself (Patton, 1990). In this approach, analysis is data-driven and not determined to align with a particular theory or the researchers' analytic preconceptions (Braun & Clarke, 2006; Nowell et al., 2017). It has been argued that an inductive approach to data analysis results in a broader and more expansive analysis of the whole data set (Kigar &Varpio, 2020).

In the current study, transcripts from interviews with pupils were all imported into NVivo and coded inductively, following the six-steps outlined by Braun and Clarke (2006). During coding, it was identified that participants in both intervention groups discussed similar types of experiences and benefits, which were inductively coded into broad codes/themes, combining the data from both interventions. Therefore, the

combined findings have been reported from both the yoga and mindfulness intervention groups. Where there were divergences between groups, these have been highlighted.

Based on a thematic analysis of the data, three overarching themes were identified; (1) 'Expectations and assumptions', covering adolescents' prior knowledge and beliefs about yoga and mindfulness; (2) 'Processes of Engagement', encompassing aspects of classes that were important to adolescents, including positive facilitator qualities, agency over choices, and a preference for interactive classes; and (3) 'Socio-emotional benefits', highlighting the range of benefits adolescents experienced after yoga and mindfulness interventions. An overview of themes is provided in Table 31 and the coding tree is provided in Appendix S. Throughout the findings, participants have been referred to by a participant ID to preserve anonymity (Table 32. Additionally, the COREQ criteria for reporting qualitative data is provided in Appendix O to increase the transparency and trustworthiness of the findings.

Table 31.

Overview of Themes from Interviews with Pupils.

Theme	Sub-theme	Description
Expectations and Assumptions	-	This theme describes adolescents' pre-existing expectations and assumptions about yoga and mindfulness interventions, ranging from positive to negative, and no prior assumptions at all.
Processes of Engagement	Positive Facilitator Qualities	Adolescents highlighted the qualities of non-reactivity, care, and respect as improving their enjoyment and engagement with intervention sessions.
	Agency over Choices	This theme describes the agency over their choices that facilitators granted adolescents within intervention classes, enabling them to sit out on any activities they did not feel comfortable with.
	Preference for Interactivity	Interactive and varied activities within intervention sessions were important for adolescents' engagement and enjoyment, with a strong preference for varied classroom activities.
Socio-Emotional Benefits	Regulating Emotions and Calming the Mind	After participating in yoga and mindfulness interventions, adolescents described improved knowledge of strategies to better regulate their emotions, which helped to calm their minds and relax pupils.
	Positivity, Confidence, and Strength	This theme describes the positive emotional and physical changes, such as increases in self-confidence and self-esteem, changes in mindset or perspectives. Yoga participants also described changes to their physical health and strength.
	Focus and Concentration	Increases in focus and concentration in the classroom were perceived by adolescents, which were thought to contribute to more conducive learning environments within lessons.

Table 32.

Adolescent Anonymised Participant ID Codes.

Yoga	Gender	Participant ID	Mindfulness	Gender	Participant ID
Yoga Group 1			Mindfulness Group 1		
Participant 1	F	YP1	Participant 1	M	MP1
Participant 2	F	YP2	Participant 2	M	MP2
			Participant 3	M	MP3
Yoga Group 2			Mindfulness Group 2		
Participant 1	M	YP3	Participant 1	M	MP4
Participant 2	M	YP4	Participant 2	M	MP5
			Participant 3	F	MP6
Yoga Group 3			Mindfulness Group 3		
Participant 1	M	YP5	Participant 1	M	MP7
Participant 2	F	YP6	Participant 2	F	MP8
Participant 3	F	YP7			
Yoga Group 4			Mindfulness Group 4		
Participant 1	M	YP8	Participant 1	M	MP9
Participant 2	M	YP9	Participant 2	F	MP10
Participant 3	M	YP10	Participant 3	M	MP11
Yoga Group 5			Mindfulness Group 5		
Participant 1	M	YP11	Participant 1	M	MP12
Participant 2	M	YP12	Participant 2	F	MP13
Participant 3	M	YP13	Participant 3	M	MP14
Yoga Group 6			Mindfulness Group 6		
Participant 1	M	YP14	Participant 1	F	MP15
Participant 2	M	YP15	Participant 2	F	MP16
Participant 3	F	YP16	Participant 3	M	MP17
Participant 4	M	YP17	Participant 4	M	MP18
			Participant 5	F	MP19
Yoga Group 7			Mindfulness Group 7		
Participant 1	M	YP18	Participant 1	M	MP20
Participant 2	F	YP19	Participant 2	M	MP21
Participant 3	F	YP20	Participant 3	M	MP22
Participant 4	M	YP21	Participant 4	F	MP23
			Participant 5	M	MP24

7.2.1 Expectations and Assumptions

Adolescents discussed their prior knowledge and expectations of yoga and mindfulness interventions, which influenced their openness to trying new things and their views about what interventions would entail. Prior expectations were based on various influences, including being derived from the media and based on the experiences of others.

Perceptions derived from the media largely framed the narratives around yoga practice. Participants reported that movies generally portrayed yoga in a way that adolescents viewed as negative and off-putting. Media-fuelled labels, such as "*the stuff you seen in films*" (YP1, female), included stereotypes such as yoga is only for "*flexible*" (YP2, female) people, as mainly practiced by women, or only for those with weight issues. Stereotypes such as these altered adolescent's prior expectations and led to views that yoga may be too "*difficult*" (YP2, female) or irrelevant for them.

In contrast, other media portrayals that went against these classic stereotypes positively influenced prior expectations. For example, participants who discussed athletes who engaged in yoga or mindfulness practice were more receptive to it; this was especially true for male adolescents who valued the potential physical benefits of yoga. These 'celebrities' were seen to validate the practice: "*if they do it then it must have a good benefit*" (YP4, male). This type of validation was also true of friends or family members who had prior experience in yoga or mindfulness interventions. Those with these connections generally had more knowledge around yoga and/or mindfulness and were therefore more open to engaging in the interventions. However, only a minority of participants had prior peer or familial experience of these interventions within the current sample.

Despite the wider influence of the media and any validation from others, approximately three-quarters of participants had very limited or no prior knowledge or

expectations. Holding no expectations could be an enabler or barrier to willingness to practice. For some participants, limited knowledge necessitated reliance on minimal cues in order to construct an idea of what interventions may entail, which generally led to negative attitudes:

> *"I didn't have the best expectations because Mindfulness kind of sounds boring. That's what I thought, that was my assumption."* (MP9, male)

"*Boring*" was a word that was particularly prevalent in relation to pre-intervention expectations of mindfulness classes, however this was not always borne out in adolescents' experiences. This initial expectation may be related to the more traditional classroom-based nature of mindfulness interventions, in comparison to yoga, which was generally seen as more practice based and physical. This distinction between yoga and mindfulness also came through when adolescents discussed the perceived differences between yoga and mindfulness, based on their limited prior knowledge. Possibly picking on cues within the name itself, mindfulness was perceived as "*for your mind*" (MP24, male) and a tool to "*control your brain*" (MP7, male), focused primarily on the psychological mechanisms. In contrast, yoga was discussed in relation to bodily attributes, including relaxation, calmness, and releasing muscle tension; "*I was excited because I wanted to stretch my body*" (YP5, male).

Minimal prior expectations of yoga and mindfulness interventions could also serve as an enabler for some adolescents. Indeed, participants without prior negative stereotypes were more enthusiastic about trying new things. They stated, *"I was interested, I've never done yoga before, so I was interested to do it"* (YP14, male) and *"I never really knew a lot about mindfulness, and I was quite eager to learn about it"* (MP7, male).

Overall, this theme highlighted how some participants held prior expectations and assumptions about interventions. These expectations could be positive or negative and

were based on different sources, including media portrayals, the experiences of peers, family, or celebrities, or purely based on cues within the names itself. These prior beliefs altered participants' perceptual sets, which in turn, impacted how these individuals interpreted and responded to the interventions in so far as having their expectations confirmed or disconfirmed.

7.2.2 Processes of Engagement

7.2.2.1 Positive Facilitator Qualities. Adolescents highlighted several personal qualities, skills, and attributes of intervention facilitators that differentiated them from participants' usual schoolteachers. On the surface, adolescents used a range of positive adjectives to describe facilitators, including kind, caring, nice, friendly, understanding, patient, and calm. Nevertheless, the overriding quality that participants highlighted was intervention facilitators' non-reactivity. This manifested itself in terms of intervention facilitators' reluctance to raise their voice and their ability to maintain a calm attitude:

> *"I think [Name] was a nice teacher as well, because even though we can… every now and then we can misbehave, she wouldn't shout at us or scream or say 'I'm done with you' or 'you step outside'. She would understand that some kids misbehave, and she would allow us to calm down."* (MP9, male)

As opposed to shouting, intervention facilitators used a range of alternative strategies to manage behaviour within classes. For some, these strategies were subtle, and adolescents remarked that the intervention facilitator could *"make the whole class calm without us really noticing"* (MP7, male). The more overt strategies that facilitators used included the sound of ringing from a singing bowl, the facilitator calmly waiting for the class to stop talking, and strategies involving bargaining with adolescents for activities that they valued. Participants articulated their experience of some of these techniques:

> *"Most teachers would like shout to get us silent, but she would calmly say stop talking or she would ring the bell and that would stop us from talking."* (MP18, male)

These strategies indicate that facilitators strove to maintain a sense of calm within the classroom by modelling their teaching practices. Furthermore, they used positive reinforcement techniques to praise adolescents when the class was settled and ready to learn, instead of negative reinforcement techniques to highlight misbehaviour.

Indeed, adolescents valued intervention facilitators' non-reactivity and stated this contrasted with other teachers and school staff. Participants described how school staff got *"angry"* (MP8, female) and *"shouted"* (YP2, female) regularly, which was not felt to contribute to a positive classroom environment. Despite this, negative reinforcement was highly prevalent within adolescents' overall school experiences, and they accepted this as a natural part of interactions with school staff. Thus, non-reactivity and positive reinforcement strategies employed by intervention facilitators distinguished intervention classes from normal school structures. One participant described this stark contrast in approaches:

> *"Say we would lose our focus, [yoga facilitator] would let us go into the Childs pose and calm ourselves and then go back to it. With our tutor, he would be there giving out detentions."* (YP6, female)

Where intervention facilitators had practiced non-reactivity, this encouraged a respectful environment within the class, where adolescents articulated a balance of mutual respect between them and the facilitator: *"she respected us, so people pay that respect back"* (MP13, female). This mutual directionality was also different from the relationships that adolescents held with other schoolteachers, where respect was unidirectional. Adolescents described how intervention facilitators earned their respect through their non-reactivity and caring nature. Participants highlighted that intervention facilitators paid attention to them as individuals and asked how they were at the start of class as a demonstration of their compassion and kindness. This simple demonstration of thoughtfulness had positive effects on how comfortable adolescents felt in classes.

Whilst non-reactivity was a dominant theme in the majority of participants' experiences in yoga or mindfulness interventions, one group discussed a time where their intervention facilitator had demonstrated reactive, as opposed to non-reactive, practices. Participants reflected on how the facilitator was unable to control the class, and this led to them shouting, before attempting to ground themselves with a breathing exercise:

"I think one time I saw her trying to do a breathing exercise. I don't think it worked." (MP24, male)

Participants who observed this reflected on the limited benefits of breathing exercises; they did not see their facilitator embodying the practices they were teaching, which undermined the aims of the classes and went against their expectations of a calm facilitator. Consequently, facilitators' reactivity severely damaged any connection with adolescents and decreased their enjoyment of the intervention.

7.2.2.2 Agency Over Choices. Another way that intervention facilitators communicated their respect to adolescents by placing the agency of choice in the hands of the adolescents themselves. Participants described how intervention facilitators invited them, rather than forced them, to take part in the intervention activities and respected their choice to share in the activity or not. Participants commented that "*you didn't have to do it if you didn't want to*" (MP3, male) and that facilitators *"would try to encourage us but would never force us"* (MP19, female). Having this choice made adolescents feel as though facilitators respected their "*boundaries*" (YP13, male) and they felt more in control in a new and unfamiliar situation, rather than "*pushed*" (YP11, male) to try things that they may not have felt comfortable with. This, in turn, increased engagement and enjoyment.

Having a sense of agency appeared to be more important for yoga participants, given the highly practice-based nature of the intervention. Some participants expressed worries over their flexibility (possibly linked to media perpetuated stereotypes) and,

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therefore, their ability to do the various asana poses. Additionally, participants highlighted self-conscious worries over being "*judged*" (YP11, male) by their peers. In response to these concerns, participants described how intervention facilitators encouraged them to try but also facilitated an environment where they had the power to choose:

> "*[Facilitator] gave us a choice, like if we didn't feel comfortable doing a Yoga pose, we didn't have to do it, but we had to at least try.*" (YP1, female)

In some circumstances, participants reported being "*shocked*" (YP13, male) that they were given this choice and initially thought intervention facilitators may have been disingenuous in their choice-giving approach. However, when this choice was combined with positive reinforcement from facilitators when adolescents made these choices, participants accepted that intervention facilitators were genuine in their agency transfer. Moreover, this choice was combined with thoughtful and considerate instructions from yoga facilitators coaching adolescents through the process of how to participate in the various asanas safely and appropriately. This caring approach enabled adolescents to make informed decisions about whether to engage, and reinforced perceptions regarding the caring qualities of the intervention facilitators. Thus, intervention facilitators were perceived as creating a safe space for personal exploration of new experiences within the boundaries of the classroom.

This agency over choices was particularly valued by female participants, who noted that there were certain forward-bend asanas, which they felt uncomfortable or embarrassed performing in mixed-gender classes: "*in front of the boys it's just awkward doing poses like Downward Dog" (*YP1, female).

Additionally, participants discussed the timing of classes (Monday morning; 9:30am) as contributing to the value they placed on increased agency. Some liked the opportunity to start the week off with mind-body interventions, as it helped them feel

"*ready to learn*" (YP5, male). In contrast, other adolescents described their lethargy and exhaustion on Monday mornings and therefore valued the choice to "*rest*" (YP18, male) at any point during the class.

Despite the potential positive effects of giving adolescents more agency over their actions, this was also met with some adolescents taking "*advantage*" (MP12, male) of intervention facilitators letting them choose. As a result, this sometimes led to disruption within intervention classes: "*People will take advantage from the teachers being too kind*" (MP24, male). In some cases, this affected the dynamics and environment within the intervention classes, which became loud and distracting, with adolescents acting up and "*messing around*" (YP16, female). Thus, agency needs to be balanced against behavioural considerations to ensure all adolescents have the opportunity to learn without distraction.

7.2.2.3 Preference for Interactivity. Adolescents spoke positively and enthusiastically about the varied activities that yoga and mindfulness facilitators introduced into the classes. These activities encapsulated activities that required communication and engagement between adolescents and activities focused on a silent or indirect connection between adolescents and their peers. These activities were contrasted with their usual lessons, where adolescents were normally "*just sitting down, listening*" (MP10, female). Instead, in intervention classes, "*you are actually physically doing something*" (YP7, female); subsequently, adolescents viewed intervention classes as more "*fun because we don't get to do that in [other] classes*" (MP1, male).

For the more practice-based yoga groups, the preference for the interactive elements of the classes were clear and aligned themselves with adolescents' prior expectations of a physical component to classes. Participants specifically emphasised their positive feelings towards "*the balancing*" (YP1, female) poses, which increased

their capacity for focus and concentration. Moreover, they were increasingly seen as an achievable challenge for adolescents who could see progress over the ten-week intervention. Child's pose was also popular with adolescents for its relaxing effects. Relaxation continued to be a strong theme throughout participants' accounts of their experience of yoga classes, where "*in that one hour, it's time to relax*" (YP9, male). This was different to other lessons that were more academically focused. Participants reflected how they valued the time at the end of the class to *"shut your eyes and forget about everything"* (YP9, male). Other participants within the yoga intervention concurred and described this time as particularly "*calming*" (YP4, male) and "*peaceful*" (YP3, male), where they were being given permission to do nothing.

There were also relaxation exercises within the mindfulness intervention that had similar effects for adolescents' calmness and relaxation. Participants in both intervention classes reflected on how "*rare*" (YP4, male) it was that their class was quiet and valued this indirect connection between the class, where individuals respected the time and space granted to them to relax:

> *"[It was] relaxed and it was very quiet, because our class is never quiet, we are always talking. This was the first time in like the whole year that we were quiet, it was very relaxing." (*MP8, female)

Despite being classroom-based, participants also highlighted certain mindfulness lessons as being particularly interactive and engaging; predominantly sessions where facilitators brought in additional resources to help illustrate the concepts being taught. For instance, using an inflated balloon that was designed to encourage adolescents to respond to their fear and highlight to them that they were in control of their reactions. Similarly, participants spoke of their enjoyment of the mindful eating lesson for its interactivity, where facilitators encouraged adolescents to come off autopilot and pay attention to their experience of eating. Subsequently, participants cited these as the "*best*" (MP23, female) lessons within the ten-week mindfulness curriculum.

These positive interactive experiences contrasted with participants' expectations of mindfulness as 'boring', suggesting that adolescents' initial assumptions were not always borne out in their experience. Instead, their prior beliefs were disconfirmed through their experiences. This was highlighted in participants' reflections at the end of the interventions: *"I thought mindfulness was going to be a bit boring, but then when we actually done the lesson, it was better"* (MP11, male). Yet, given the more traditional nature of mindfulness classes, the lessons with fewer interactive activities were viewed less favourably. Adolescents acknowledged that some mindfulness lessons were felt to be slow and repetitive, which lost their attention. These individuals spoke of their peers in yoga classes with an element of envy: *"They were doing all this stuff and we were sitting down in our hard chairs"* (MP20, male). This quote reiterates the dialogue used in participants' expectations of yoga and mindfulness classes, where yoga was seen as more practice-based, whilst mindfulness was seen as a more traditional talking-based class. These findings indicate that adolescents favoured interactive and practice-based activities and future iterations of yoga and, in particular, mindfulness classes should aim to maximise engagement through a range of activities to support learning:

> *"I think you should do mindfulness in other schools but add other activities and make it more fun for the person and then they will like it more and they will learn from it."* (MP23, female)

7.2.3 Socio-Emotional Benefits

7.2.3.1 Regulating Emotions and Calming the Mind. The most prevalent benefits that participants reported were an increased ability to regulate emotions, specifically stress and anger, and consequently, a heightened sense of calm within themselves. The majority of participants suggested that interventions directly impacted their emotional regulation and sense of calm; they *"relieved stress and anxiety"* (MP1, male) and helped to *"calm down your mind from stress"* (YP3, male).

A key mechanism identified across both intervention groups as responsible for increased emotional regulation and a sense of calm was the breathing and grounding exercises. Participants agreed that these were particularly helpful for managing stress and anxiety in relation to everyday pressures, including challenging lessons, homework, and exams. One participant recounted how they applied a mindfulness technique to deal with a highly stressful recent incident, which serves as a reminder of the social context of these adolescents' lives:

> *"Yesterday, something bad happened – there was a stabbing near my house. There were literally five police officers, they blocked off this big main road and then they blocked it off. FOFBOC [feet on floor, bum on chair – grounding exercise] helps me handle stressful times, it helps me get through stressful things."* (MP3, male)

Those who participated in the yoga and mindfulness interventions spoke similarly about the usefulness of breathing and grounding exercises. However, participants in each intervention had different ways of articulating the other mechanisms responsible for supporting their emotional regulation and sense of calm. Those in the yoga intervention articulated their increased emotional regulation in terms of physical and emotional calm in the face of stressful situations. Indeed, the strategies they had learned helped to slow their breathing and heart rate, helping to calm them down:

> *"When I'm very angry, I can stay calm and do something called waterfall breath and I do that when I'm angry."* (YP8, male)

In contrast, the notion of emotional control dominated the narratives of participants who had taken part in the mindfulness intervention. Participants discussed how before classes, *"your mind takes control of you, instead of you taking control of your mind"* (MP1, male). However, after mindfulness, adolescents felt more able to "*control [their] feelings, instead of the feelings controlling [them]*" (MP18, male). Interestingly, participants in the mindfulness group spoke about their emotional regulation using extended emotional literacy, suggesting the value of the terms taught in the classes.

Participants spoke proudly about their new vocabulary, and also demonstrated their understanding of the flight or fight response to stress and how that contributed to feelings of anger, which helped them to recognise these reactions and "*take a step back*" (MP4, male):

> "*When you're angry you could do anything because you are angry. You can't control yourself, so if you do Mindfulness, you can control yourself, you just slowly calm down and relax.*" (MP16, female)

Adolescents in both groups noted how their increased awareness of emotions and strategies to regulate these reduced the number of disputes they got involved in at school and home. Instead of reacting to conflicts, they walked away from any arguments, resulting in "*less detentions than last year*" (MP6, female) and improvements in their home life and relationships, particularly their families and "*siblings*" (YP10, male):

> "*I've used it a few times this year and like I didn't fight, I walked away from the problem without swinging.*" (MP1, male)

Overall, the calmness that participants gained from improved emotional regulation helped adolescents "*get through the week*" (YP1, female). Participants in mindfulness groups concluded that "*it's the only thing that calms me down*" (MP8, female), whilst those in the yoga group took away that "*you need yoga in your life to relax*" (YP2, female). As such, adolescents were disappointed that the interventions ended; it was "*helpful, but now it's gone*" (MP1, male):

> "*Now every single day for a classroom for an extra hour every Monday morning. You're going to have to sit there writing and whatever, when we could be relaxing.*" (YP6, female)

7.2.3.2 Positivity, Confidence, and Strength. In addition to helping adolescents to regulate negative emotions, yoga and mindfulness interventions also supported the development of positive mental and physical states. These included a more positive mindset, increased self-confidence, and improved physical and mental strength. Throughout the interviews, participants reflected on how their general attitude and

mindset had become more positive since participating in the interventions. They approached situations with more confidence and greater expectations of success and positivity. Adolescents described how they felt happier, more appreciative, and generally a *"better person"* (MP8, female) with this new mindset. In the short term, this helped adolescents to "*feel more positive about the week ahead*" (YP6, female), whilst in the long-term this enabled them to "*see the world differently*" (MP12, male).

Focusing on the more positive aspects within adolescents' lives required paying attention to the good things and consciously directing attention to focus on the positive rather than the negative. Where participants developed these skills, they realised that "*you don't need to carry your bad thoughts with you*" (MP11, male), and instead replaced them with more positive ones. For some, a shift in thinking patterns was responsible for increasing adolescents' gratitude for the good things in their lives by giving them valuable reflection time. For others, an increased awareness of the good in their lives appeared to directly lead to a more positive mindset. Regardless of the direction of causality, gratitude and positive mindsets were intrinsically connected and both improved after participation in the interventions:

> *"It made me feel a bit happier and more appreciative of the things I have. It made me realise that I am in a situation where I should be happy and not upset and it made me think positively."* (MP7, male)

A more positive mindset also contributed to adolescents' wellbeing by increasing their self-esteem and self-confidence. For yoga participants, this increase was strongly tied to performing poses in class, where confidence arose from the sense of community generated by everyone doing the same pose at the same time, which reduced worries over self-consciousness: "*yoga made me feel a bit more confident because everyone just does it at the same time*" (YP6, female). For others, confidence was generated from the trust yoga facilitators' put in adolescents when they volunteered to lead practices. Standing in front of their peers and delivering sequences (e.g., sun salutation) for others to follow

made participants feel more confident and *"accomplished"* (YP12, male) within themselves. This increase in confidence also translated to mindfulness classes, where adolescents felt increasingly confident and calmer when asked to talk in front of the class.

Participants also described various social benefits arising from this newfound confidence. Participants felt like they had become better, more confident people, where they *"started talking to people more"* (YP5, male). Perhaps due to this, they felt like they had attracted more friends. Other participants felt that it had brought their existing friendship groups *"closer"* (MP10, female) as they were more grateful for their relationships. One participant expressed how they valued their friendships more and wanted to give out *"more hugs"* (YP20, female) to communicate their gratitude to their friends, whilst another expressed the increased emotional support within their friendship group.

Whilst for some adolescents, growing social circles were described positively; for a small number of others, the mental strength to say 'no' to more negative friendship groups was the most important social benefit that came out of their new perspective and improved confidence. This reflection helped adolescents to see the bigger picture and make better decisions with regard to their friendship groups:

> *"When you're not stressed, you make like good choices. Like imagine someone is doing something as a group and they tell you to join but then you don't join them because you know what they are doing is bad."* (MP17, male)

Whilst not as prevalent as many of the other benefits, a minority of adolescents in the yoga group (predominantly male) described benefits for their physical, as well as mental, strength. For those who had expectations based on physicality and athleticism, they hoped for improvements for their physical strength: *"I wanted to do it because I felt like it was going to make me more flexible and stronger"* (YP4, male). These expectations were generally confirmed in their experiences, where yoga made them feel physically strong. These benefits were directly linked to sporting hobbies; specifically, flexibility,

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recovery time, and stamina: *"If you do yoga positions, your legs start to relax, and they don't hurt and it's easier to play [football]"* (YP10, male). However, after participation in yoga interventions, participants came to realise that yoga was not constrained to physical strength and physical health benefits; participants took away an appreciation of a broader array of benefits than they initially thought:

> *"It's not really a sport type of thing... it's [yoga] more to relax you and relieve stress."* (YP6, female)

7.2.3.3 Focus and Concentration. Possibly resulting from strategies to regulate emotions and a more positive outlook, adolescents commented that they could think more clearly after taking part in the interventions. This had direct benefits for their ability to focus on intervention sessions. However, these benefits also translated to other lessons within the curriculum, where adolescents reported an increased readiness to learn. Consistent with the notion of control, participants in the mindfulness group spoke of their increased ability to control the direction of their attention. This benefitted their concentration in lessons through a constant redirection of attention to the facilitator:

> *"We learnt how to control our minds in different places. And if you look that way, your mind goes that way, but if you look that way, your mind goes that way. But we learnt to look at the teacher that is talking to you, so your mind is focused on the person who is talking."* (MP20, male)

For participants in both the interventions, there was also a sense that being calmer was more conducive to learning and resulted in more focused and less chaotic classrooms. This was apparent to participants, who noticed that their lessons were generally quieter, with less disruptions. Individual participants who admitted to previously disrupting lessons noticed this change within themselves and refrained from this sort of behaviour after participation in yoga or mindfulness interventions: *"It's helped me to calm down and not talk that much"* (MP10, female). Fewer classroom disruptions, resulting from increases in focus and concentration, were seen to be advantageous for the whole class,

who were better able to focus on the content of their academic lessons. In turn, this was felt to be beneficial for adolescents' grades in future tests and exams:

> *"If I get stressed about an exam, my thoughts go everywhere but after Yoga my thoughts… like I have more clear thoughts."* (YP1, female)

Despite benefits for concentration and purposeful directing of attention, some participants felt that ten weeks was not enough to sustain the benefits observed. One participant reflected that: "*My concentration is becoming a tiny bit better, but I think I need another eight-weeks"* (YP5, male). This suggests that these changes were relatively short-lived for some. Like all skills, attention and focus needed practice; and yoga and mindfulness interventions were opportunities for adolescents could practice these skills in preparation for academic lessons.

7.3 Discussion

The primary aim of the current study was to understand the acceptability, experiences, and perceived benefits of school-based yoga and mindfulness interventions for adolescents from an area of low SES. The findings highlight the influence of prior expectations and assumptions on the willingness of adolescents to engage in mind-body interventions, with implications for how to introduce yoga and mindfulness to adolescents who may not have engaged in these practices before. The findings further detail the processes of engagement central to the experiences of adolescents, which contributed to their engagement and enjoyment of intervention sessions. Lastly, the findings describe the range of socio-emotional benefits articulated by participants, with examples of how these had been useful in their daily lives. Therefore, the current study provides evidence of the effectiveness of yoga and mindfulness interventions from the perspective of adolescents from low SES backgrounds. Consequently, given the universal delivery method, these findings may be viewed with increased ecological validity and application for schools.

7.3.1 Prior Assumptions and Expectations

Within the current research, it was observed that adolescents' expectations of mind-body interventions were generally quite mixed, similar to previous research (Butzer, LoRusso, Windsor, et al., 2017; McGeechan et al., 2019). These prior expectations and assumptions of interventions appeared to influence adolescents' openness to mind-body interventions. Within this, some adolescents held less positive views initially; however, most of these negative assumptions dissipated throughout the ten-week interventions. The discrepancy between more negative or apathetic expectations before the interventions and their more positive experiences after the interventions was consistent with research conducted by McGeechan et al. (2019). Whilst participants may initially have been reluctant to engage as they felt like they "had to" (p. 158) participate, over time most pupils reported enjoying the experience (McGeechan et al. 2019).

Despite negative or indifferent expectations developing into more positive experiences within the current study and McGeechan et al.'s (2019) research, it is possible that this may present a barrier that stops them from engaging completely. Motivation is largely determined by our expectations of enjoyment or success and the value individuals place on a goal; this is known as the expectancy-value model of motivation (Wigfield et al., 1997; Wigfield & Eccles, 2002). Thus, if individuals do not hold positive expectations or do not see the benefits of participation in mind-body interventions, this may negatively impact motivation and openness to engage in the experience. Therefore, future school-based yoga and mindfulness interventions may wish to consider the importance of managing adolescents' expectations about the interventions. Indeed, the current study has demonstrated the significance of communicating the potential benefits of these interventions to adolescents to increase the 'value' they place on them, which may in turn increase their openness and motivation to participate.

7.3.2 Processes of Engagement

In addition to highlighting the role of prior beliefs, the current study also identified experiential aspects of intervention classes that were important for engagement. The qualities of intervention facilitators were integral in cultivating positive teacher-pupil relationships. The qualities of non-reactivity, care, and respect were consistent with previous yoga and mindfulness research highlighting the positive attributes of the intervention facilitators (Dariotis et al., 2017; Grant, 2017; van Aalderen et al., 2014). These qualities were present in intervention facilitators' responsiveness, as opposed to reactivity, towards adolescents. Participants described how intervention facilitators did not shout and, instead, utilised other behavioural management strategies, which positively impacted perceptions of facilitators and the intervention sessions themselves (see Chapter 8, Section 8.3.2 and 8.3.3 for professionals' perspective). These findings align with past research, showing that individuals respond more positively to assertive, yet calm, behaviour from teachers (Grant, 2017; McPherson et al., 2003). In contrast to verbal aggression, a calm and assertive approach has been associated with increases in perceived teacher competence, trustworthiness, and care (Myers, 2001).

These qualities set the tone for intervention classes, where adolescents were more likely to emulate the positive behavioural role models set by the intervention facilitators. The Prosocial Classroom Mediational Model (PSCMM; Jennings & Greenberg, 2009) suggests that intervention facilitators social and emotional competencies influence the atmosphere within classes and outcomes of adolescents in the class (Figure 17).

Figure 17.

The Prosocial Classroom Mediational Model.
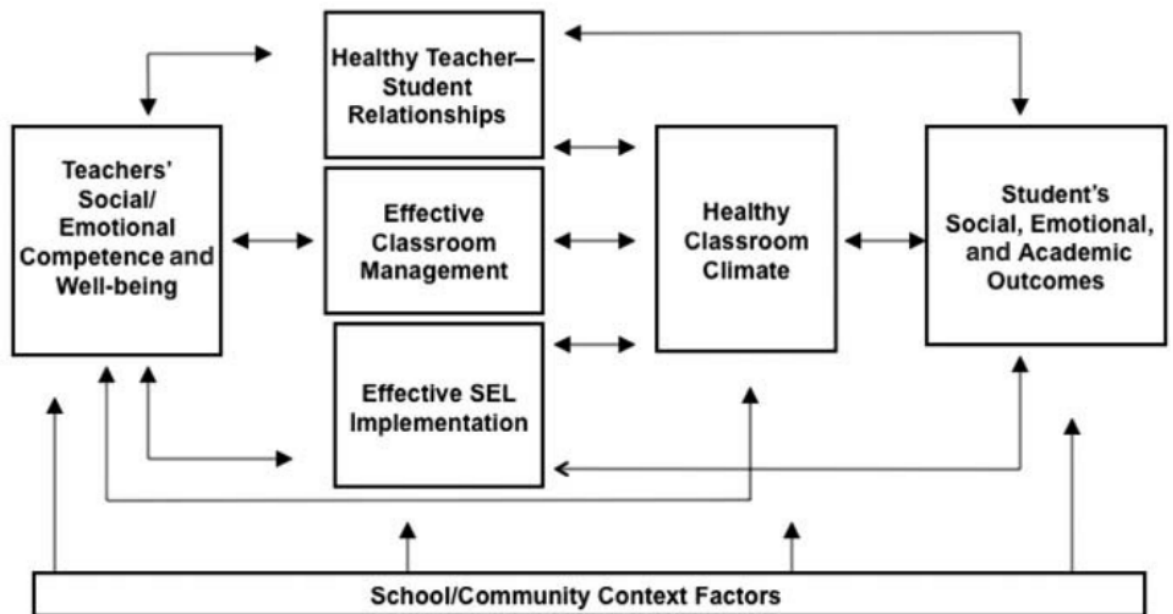
Note. Image taken from Jennings and Greenberg (2009, p. 494).

Based on the PSCMM, there are three central assumptions. Firstly, the model views teachers social and emotional competencies as integral for the development of positive pupil-teacher relationships, as it theorised that they are more aware of the emotions of adolescents and how these may impact behaviour. Secondly, it proposes that teachers with better social emotional competencies demonstrate increased use of emotional and verbal expressions to promote enthusiasm and enjoyment within the class to better manage behaviour. Thirdly, due to the increased social emotional competencies demonstrated by teachers, they are more effective when delivering wellbeing interventions due to their ability to model the desired behaviours. These factors are hypothesised to contribute to more positive classroom environments, and ultimately, better outcomes for pupils. Therefore, the PCSMM provides a model to understand the importance of teacher qualities and how these may impact classroom experiences and, ultimately, adolescent outcomes (Jennings & Greenberg, 2009).

The PSCMM points to the pedagogical importance of intervention facilitators authentically embodying the social and emotional competencies that they teach. Through this lens, facilitators demonstrate the benefits of mind-body interventions to adolescents through their experience and interactions in the classroom (Crane, Kuyken, Hastings, Rothwell, & Williams, 2010). Within the current study, participants most clearly noticed this embodying in an instance where an intervention facilitator went against their expectations and demonstrated reactive practices (shouting). Participants in this group generally held less positive views of the facilitator and intervention session, consistent with previous literature and as predicted by the PSCMM (Grant, 2017; McPherson et al., 2003; Myers, 2001; Teven, 2007). Nevertheless, research has highlighted these socio-emotional competencies as challenging for intervention facilitators to cultivate and practice, especially in classroom situations. Grant (2017) noted that employing these skills successfully relied on strong training and an established personal mindful practice from the intervention facilitators. Therefore, future yoga and mindfulness interventions should consider these skills in their facilitator selection and training protocols (Dariotis et al., 2017) to explore how they may be linked to intervention impact and implementation (Feagans Gould et al., 2016). More widely, these findings contribute to the debate surrounding the most appropriate facilitator for optimal adolescent outcomes (see Chapter 10, Section 10.2.3).

In addition to the importance of the facilitators' qualities, participants also emphasised intervention interactivity and agency over choices as central components within their engagement and enjoyment of interventions. It was suggested that interactive engagement, through various classroom activities was preferable compared to a classic, more passive classroom set-up. This preference was also described by McGeechan et al. (2019), who found that participants responded well to active practices and activities, but less well to more explanatory sessions in a mindfulness programme. As in the current

study, participants reported feelings of boredom within more passive sessions. The interactivity that came from group based activities was also highlighted in a comparison of in-person and online mind-body interventions (Boggs et al., 2014). Thus, adolescents expressed a clear preference for group-based, interactive activities to maintain their attention. In line with these findings, yoga and mindfulness interventions should ensure variation in content and activities to maximise engagement.

Within interactive intervention sessions, participants also highlighted agency over choices as a factor affecting engagement. Adolescents described how facilitators invited them to participate in intervention activities rather than telling them to partake. This differentiation was acutely important within mind-body interventions, where adolescents may be exposed to novel activities that they had not engaged in before, or where they had potentially negative expectations. When considering adolescence as a challenging period of peer and self-judgment (Bluth & Blanton, 2014; Neff & McGehee, 2010), an invitational environment may have allowed participants to feel empowered to make up their minds about their level of engagement, especially in initial sessions. This invitational and non-judgemental approach was also highlighted by adolescents in Bluth et al.'s (2016) research, where it was concluded this was a key factor that contributed to the successful implementation of mind-body interventions. Thus, placing the agency of choice within the hands of adolescents may increase acceptability and engagement. As such, school-based mind-body interventions should be grounded in invitational principles.

7.3.3 Socio-Emotional Benefits

Lastly, in contrast to the quantitative data showing limited impact on measures of wellbeing (see Chapter 6, Section 6.2.1), adolescents described the range of socio-emotional benefits after participating in mind-body interventions. These were congruent with previous qualitative literature, which has reported positive effects on the

psychological, cognitive, and behavioural functioning of adolescents. However, the current study confirmed these benefits with a larger and more diverse group of adolescents.

One of the most frequently cited benefits, and observed in the current study, was improved emotional regulation and control. This has been observed by numerous research studies in both the fields of yoga (Butzer et al., 2017; Case-Smith, Sines, & Klatt, 2010) and mindfulness (Bannirchelvam et al., 2017; Costello & Lawler, 2014; Dariotis, Mirabal-Beltran, et al., 2016; Sapthiang et al., 2019; Tunney et al., 2017; Wisner, 2014). Across both mind-body interventions, participants consistently described breathing exercises as useful coping strategies responsible for improving their self-regulation. This was primarily discussed in relation to anger management, where improved awareness of emotions and coping mechanisms decreased the reactivity of adolescents. Consequently, adolescents were less likely to react in the face of challenging situations at school or home. These self-regulatory benefits are particularly important given that high levels of self-regulation are associated with positive mental health outcomes (Buckner et al., 2009; Hu et al., 2014), particularly for low SES populations (Buckner et al., 2009).

In addition to supporting emotional regulation, breathwork also contributed to improvements in stress management, a sense of relaxation, and increased calmness. This was achieved through providing adolescents with various strategies to manage their stress more effectively. The provision of a time and space within the curriculum to pause, reflect, and relax was also helpful for reducing adolescents' perceived stress levels. Reductions in stress (and/or increases in stress management abilities) and increases in calmness and relaxation have also been observed in other studies of yoga (Butzer et al., 2017; Conboy, Noggle, Frey, Kudesia, & Khalsa, 2013; Wang & Hagins, 2015) and mindfulness interventions (Costello & Lawler, 2014; Dariotis et al., 2016; McGeechan et al., 2019). These findings are particularly encouraging given that adolescents face many

stressors within their daily lives (The Children's Society, 2017, 2018, 2020). Considering unmanaged stress is a known risk factor for mental health and wellbeing issues (Roberts et al., 2009; Suldo et al., 2008), any means of reducing stress is likely to have positive effects for the overall wellbeing of adolescents.

In addition to self-regulatory skills, mind-body interventions also improved adolescents' positivity, confidence, and physical and mental strength. Participants articulated various benefits within these categories, including self-awareness, changing perspectives, being kinder to themselves, and improved interpersonal social relationships. These benefits were in line with previous quantitative and qualitative research that has highlighted increases in self-esteem (Bhardwaj & Agrawal, 2013; Ferreira-Vorkapic et al., 2015; Sethi & Ganpat, 2013; Wang & Hagins, 2015), the development of a positive self-concept (Case-Smith et al., 2010), and improved self-confidence (Bhardwaj & Bhardwaj, 2015; Chen & Pauwels, 2014; Dariotis et al., 2016; Monshat et al., 2013; Vaishnav, Vaishnav, Vaishnav, & Varma, 2018). A more positive mindset, possibly resulting from improvements across all of these dimensions, is beneficial for mental health and wellbeing outcomes. Indeed, research has found that rumination or negative thinking patterns were significant predictors of self-harm in a sample of 14-year-old adolescents (Bjärehed & Lundh, 2008). Thus, more positive styles of thinking may be protective factors against deliberate self-harm behaviours. Increased positivity also had tangible interpersonal and social benefits for adolescents, consistent with previous research (Conboy et al. 2013; Butzer et al. 2017; Van Vliet et al. 2017). Indeed, Devenish et al. (2017) concluded that chaos in the home was a significant risk factor in the development of mental health problems for adolescents from low SES neighbourhoods. In contrast, strong social bonds mediated the relationship between deprivation and anti-social behaviour (Jiang et al., 2020). Therefore, equipping adolescents with the socio-

emotional skills to better manage interpersonal relations and reduce conflict may benefit their long-term mental health and family relationships more generally.

Lastly, adolescents also described an increase in focus and concentration. This appeared to be related to having more awareness and control over thoughts and feelings, enabling adolescents to bring their attention back to the present. These cognitive attention benefits were also congruent with the quantitative findings presented in Chapter 6 (Section 6.2.2) and qualitative data from previous yoga (Case-Smith et al., 2010; Conboy et al., 2013) and mindfulness intervention studies (Bernay et al., 2016; Costello & Lawler, 2014; Wisner, 2014). As in the current study, previous research has pointed to improvements in the classroom climate, with fewer disruptions and improved focus (Bernay et al., 2016). Consequently, it may be hypothesised that this would translate to academic-related improvements. Whilst this was spoken about as a potential benefit within the current study, it was not found to be a strong theme within the experiences of adolescents. Despite this, other research has pointed to academic and attainment improvements after mind-body interventions (Anila & Dhanalakshmi, 2016; Beauchemin et al., 2015; Benson et al., 2000; Conboy et al., 2013; Semple et al., 2005; Sharma & Kauts, 2009; Wang & Hagins, 2015; Zenner et al., 2014). Consequently, yoga and mindfulness may positively affect the school and classroom climate, resulting in more conducive learning environments (Wisner, 2008).

The range of perceived benefits highlighted in the current study is consistent with Butzer et al.'s (2016) theoretical model of potential mechanisms and outcomes of yoga-based interventions (Figure 1; Chapter 2, Section 2.3.1). Indeed, the current study has suggested benefits for self-regulation (including stress and anger management and facilitating a sense of calm), benefits for mind-body awareness (including increases in focus and concentration, increased self-confidence, and higher social awareness), and benefits for physicality for the yoga intervention (including increases in flexibility and

physical strength). These benefits, in turn, were hypothesised to lead to improvements across the domains of wellbeing, quality of life, relationships, and behaviour (Butzer et al., 2016). Whilst not explicit themes, many of these benefits were found to be evident in the narratives of adolescents; for example, decreases in anger had led to improvements in sibling relationships and reductions in disputes at school. Whilst originally developed for yoga interventions, the current study has also demonstrated applicability to mindfulness interventions, providing further evidence for Butzer et al.'s (2016) model for the impact of mind-body interventions on social-emotional outcomes.

7.4 Conclusion

This qualitative study contributes to the growing evidence base of yoga and mindfulness interventions in schools to enhance the socio-emotional skills of adolescents; including psychological, cognitive, and intra- and interpersonal social skills. The congruence of the current findings with past quantitative and qualitative literature increases the trustworthiness of the data across various intervention programmes and adolescent groups. This is particularly important given the previously neglected population of vulnerable adolescents from areas of high deprivation in the UK. Moreover, these findings provide strong evidence of the acceptability of yoga and mindfulness interventions in the school context, clarifying the aspects that were integral for adolescent engagement and enjoyment and aspects that negatively impacted their engagement. To further contextualise the experiences of adolescents, Chapter 8 continues to present the data generated by the intervention facilitators and school staff to shed further light on the process of intervention implementation and delivery.

8. Qualitative Findings: Professionals' Experiences of Implementing Yoga and Mindfulness Interventions into the School Curriculum

8.1 Overview of Chapter

This chapter presents the qualitative research findings from interviews with school staff and intervention facilitators involved in implementing and delivering yoga and mindfulness interventions for adolescents within the school. The data was generated from individual semi-structured interviews with 16 professionals (19 interviews) over Year 1 and Year 2. These have been integrated together to better understand the facilitators and barriers for implementing wellbeing interventions within the curriculum in a mainstream urban school. Subsequently, professionals' perspectives are considered in the context of previous literature.

8.2 Findings

Consistent with the approach taken to analyse the interviews with pupils, an inductive analysis was also adopted when considering the interviews with professionals (Braun & Clarke, 2006; Nowell et al., 2017). After importing all professionals' data into NVivo and coding the data into initial themes, it was identified that professionals involved in both the yoga and mindfulness interventions described similar process-related factors that affected implementation and delivery. Thus, the themes were broad enough to capture the data from both yoga and mindfulness professionals and has therefore been reported together.

Based on a thematic analysis of the data, four overarching themes were identified: (1) 'Drivers of implementation', describing professionals' motivations for integrating yoga and mindfulness interventions into the school context; (2) 'Building trusting relationships', encompassing the importance of positive relationships between intervention facilitators and pupils, and between intervention facilitators and school staff; (3) 'Practical considerations', highlighting on-the-ground implementation challenges

within delivery; and (4) 'Intervention exposure and sustainability' covering the short-lived nature of benefits without any follow up to the provision of yoga and mindfulness interventions. An overview of themes is provided in Table 33 and the coding tree is provided in Appendix T.

Throughout the findings, participants have been referred to by a participant ID to preserve anonymity (Table 34). Additionally, the COREQ criteria for reporting qualitative data is provided in Appendix O to increase the transparency and trustworthiness of the findings.

Table 33. *Overview of Themes from Interviews with Professionals*

Major Theme	Sub Theme	Description
Drivers of Implementation	Concern for Adolescents' Mental Health and Wellbeing	This theme describes professionals' concerns for the increasing rates of adolescent mental health and wellbeing problems, with a particular focus on the compounding nature of the demographics of the local area.
	Availability of School-Based Support	Within this theme, professionals discussed resource and capacity-related challenges, limiting school-based support for adolescent mental health and wellbeing.
	"I Want Them to Feel Empowered": Aspirations for Pupils	This theme describes professionals' hopes and aspirations for what yoga and mindfulness interventions could offer adolescents, equipping them with a toolbox of skills to improve their self-regulation.
Building Trusting Relationships	*"What can I learn from them?":* Earning pupils' trust and respect	Within the facilitator-pupil relationships, intervention facilitators described a range of strategies that they used to build rapport and facilitate positive and trusting relationships with adolescents within class.
	Collaboration with School Staff	Relationships between professionals were deemed important for classroom dynamics, in particular for helping to manage behaviour and for encouraging participation.
Practical Considerations	Pupil Attitude and (Mis)Behaviour	This theme describes the challenges relating to the universal delivery method, where some pupils did not want to engage. Appropriate behaviour management is considered, in line with optimising exposure and in line with the overall ethos of wellbeing classes.
	Intervention Curriculum Inclusivity	Tailoring the intervention to the context and demographics of the group was important, which relied on intervention facilitators' skills and expertise where adaptations to the specific cohort needed to be made.
	Physical Environment and Logistics	This theme highlights the practical and logistic challenges relating to class size, layout, and setup, which could impact upon delivery.
Intervention Exposure & Sustainability	Seeing the Benefits for Pupils	This theme highlights the perceived wellbeing benefits that professionals observed within adolescents' behaviour, consistent with their aspirations for pupils.
	"It Comes and it Goes Very Quickly": Optimising Exposure	The importance of sustainability is described within this theme to support the maintenance any benefits long-term. Future implementation strategies were debated in terms of internal vs. external teacher delivery and pupil selection strategies.

Table 34.

Professionals Anonymised Participant ID Codes.

Participant Group	Interview	Year	Code	Interview	Year	Code
School Staff	Yoga Form Teacher 1	1	YFT1	PSHE Lead	1 & 2	Lead
	Yoga Form Teacher 2	1	YFT2	Mindfulness Form Teacher 1	1	MFT1
	Yoga Form Teacher 3	2	YFT3	Mindfulness Form Teacher 2	1	MFT2
	Yoga Form Teacher 4	2	YFT4	Mindfulness Form Teacher 3	2	MFT3
Intervention Facilitator	Yoga Facilitator 1	1	YT1	Mindfulness Facilitator 1	1	MT1
	Yoga Facilitator 2	1 & 2	YT2	Mindfulness Facilitator 2	1 & 2	MT2
	Yoga Facilitator 3	2	YT3	Mindfulness Facilitator 3	2	MT3
	Yoga Facilitator 4	2	YT4	Mindfulness Facilitator4	2	MT4

8.2.1 Drivers of Implementation

8.2.1.1 Concern for Adolescents' Mental Health and Wellbeing. Participants described how adolescence was generally a "*difficult*" (YT4) period. Specifically, for the age group involved in the current study, participants noted that this was the time where there was "*a lot of change happening within the brain and body*" (YT3). Consequently, this age group were referred to as quite "*unsettled*" (YFT2), owing to their inability to self-regulate their emotions and behaviours:

In addition to adolescents' age, lower-level wellbeing and more serious mental health problems were linked to "*a range of pressures*" (MFT1) on adolescents, including social media, peer group issues, problems at home, and pressure at school:

> "*Young people today are under a huge amount of stress in their lives, outside of school, as well as in school and socially. With the way technology is now, social media is a massive stress. And then obvious things like pressures from exams.*" (YT1)

Regarding academic pressures, staff acknowledged that pupils' "*workload*" (YFT2) could be a contributing factor. Around exams, participants cited "*anxiety issues, lots of worrying, lots of overthinking, and sleeplessness*" (MT2). School staff recognised the "*national focus on exams and attainment*" (Lead) as putting pressure on both pupils and professionals working in schools:

> "*Then they come to school, and there is the pressure put on them, in terms of results and attainment. A lot of our students have come in with lower-than-average starting points are still getting that national message of 'well, you've got to pass your exams, you've got to go to the Sixth form, and you've got to go to University'. For a lot of them, they are looking at that and going, I don't think that is realistic for me, I don't know whether I want this.*" (Lead)

Participants also reported that wellbeing may be negatively affected by complex home lives. Given the location of the school in a low SES area, the culture of "*austerity*" (Lead) was highlighted as a cause of stress for families. One professional reflected that "*no one is inherently mischievous or inherently more disruptive*", but given the local demographics, some of the adolescents may live in "*slightly tougher circumstances,*

which makes them more reactive" (MT3). Issues such as domestic violence, poor- or low-quality accommodation, overcrowding, and financial concerns were deemed to be more likely, based on the local area deprivation statistics and what school staff knew of local family circumstances.

Moreover, the geographical location of the school and local area was seen to negatively affect the wellbeing of pupils due to high levels of knife crime in recent years. Despite not involving pupils in the school directly, it was highlighted that several incidents had taken place in the local community, which had affected adolescents:

> *"Lots of our kids knew kids that were involved [in stabbing incidents], but I think actually the ones who are really worried about it as an issue, are the youngest. They hear the stories, they feel very close to it, they are frightened by it."* (Lead)

8.2.1.2 Availability of School-Based Support. Despite recognising the various mental health and wellbeing problems adolescents face, participants perceived there to be limited resources for schools to effectively support the wellbeing of pupils. Many of the mental health issues experienced by pupils were not "*deemed severe enough for mental health services*" (MT2), due to the high thresholds of need that CAMHS had imposed as they were "*overrun*" (MT3) with referrals.

Set against a backdrop of limited external support, schools did not feel equipped to adequately support mental wellbeing. Whilst school staff referenced the use of "*mental health posters*" (Lead) and various topics within assemblies, there was recognition that "*there isn't much really*" (MT2) when asked about the types of support available within the school. Given this, participants called for "*more provisions in school to support our students*" (MFT1).

However, participants noted that there was not "*enough funding*" (MT4) for school-based mental health services. Participants described recent decreases in funding and subsequent redundancies of pastoral staff, which reduced the support they could offer.

Due to limited capacity, staff described their wellbeing approach as "*crisis management*" (Lead). Whilst this was acknowledged as a reality, intervention facilitators believed that the mental health and wellbeing of adolescents needed to be more highly prioritised:

> "*I think that there needs to be a rethink in terms of what's important. If it's important to pay money for a swim teacher, it is just as important to pay money for a teacher to come in and teach them essential mental and emotional wellbeing tools. For me, it's more important because that's what they're dealing with every day. They're not swimming in an ocean every day.*" (MT3)

All illustrated in the above quote, support for mental health and wellbeing was seen as a specialist resource, which came at a premium due to the extensive training required. Whilst this was viewed as a barrier to the provision of mental health support, it was also acknowledged as necessary as "*you're looking for people who have been trained, who are experienced, who are experts, which costs money*" (Lead). Consistent with this viewpoint, all intervention facilitators had completed various courses to broaden and deepen their knowledge base. This gave them the resilience and skills to successfully deliver wellbeing classes and adopt the "*tone you need to set*" (YT2) within such a class:

> "*It's hard to teach Mindfulness when you are stressed yourself. I was grounding myself continuingly throughout my lesson, that's something I've been trained to do.*" (MT2)

Given the context of young peoples "*deteriorating*" (MFT1) mental health and wellbeing issues, combined with diminished resources, school staff welcomed the introduction of yoga and mindfulness into the school context. Both interventions were felt to be consistent with the aims and learning objectives of the PSHE curriculum, as a "*time during the week where people focus on their mental health*" (MFT2), which indicated that the school "*values their need to relax*" (YT2).

8.2.1.3 "I Want Them to Feel Empowered": Aspirations for Pupils. Given the widespread concern for adolescents' wellbeing, professionals were hopeful about what mind-body interventions could achieve. For intervention facilitators, the ultimate aim was

to "*empowe*r" (MT3) pupils with a "*toolbox*" (YT1) of self-help tools and strategies to support them to manage their mental health and wellbeing. Cultivating a sense of self-awareness was seen as integral part of this toolbox to help adolescents to become more aware of their emotions and behaviour and "*respond, not react*" (MT3):

> "*This idea that I try to convey is this idea of cultivating this sense of self awareness, which they can take with them and use in everyday life and use it whenever they can… use it in other things that they do. So, being able to self-regulate and say, 'I feel this, so I need that'.*" (YT2)

With improvements in self-regulation through increased self-awareness, school staff hoped that these skills would equip adolescents with better strategies to "*cope with their stress and anxiety*" (YFT2). Similarly, there were hopes from school staff that improvements in emotional regulation and stress management could "*give them the ability to focus*" (FYT1) and improve academic engagement and attainment. With the articulation of these hopes for adolescents, it was implied that pupils did not currently have these skills or opportunities to learn them from other avenues. Consequently, the potential of mind-body interventions to support adolescents' self-awareness and attunement with their emotions was recognised as a unique contribution within the curriculum. Whilst the below quote was spoken about in relation to yoga, the breathing and grounding techniques discussed have equal application to mindfulness interventions, showing the utility of these interventions in teaching adolescents the skills to regulate their emotions and behaviours:

> "*I think it would be a very good idea for schools to have yoga in the timetable, or a similar thing, because [schools] ask for the students to behave and control themselves, but we don't give them the equipment and the knowledge of how they will control themselves in an anger situation. They learn about that in the yoga lesson. They learn that they can use their breathing to control their anger. They can use their fingers to concentrate.*" (YFT4)

8.2.2 Building Trusting Relationships

8.2.2.1 "What Can I Learn From Them?": Earning Pupils' Trust and Respect. School staff described how pupils generally did not react positively to external professionals coming into their environment. Subsequently, staff reflected that adolescents regularly treated anyone new with a level of "*suspicion*" (YFT2), indicating their distrust of external professionals, at least initially. Intervention facilitators themselves acknowledged this viewpoint from pupils, who may have seen them as an "*outsider*" (YT3) who they did not want to "*accept*" (YT2) into their world. Having acknowledged this as a possibility, intervention facilitators adopted strategies to help build rapport and facilitate positive relationships with adolescents, always striving for "*authenticity and patience*" (MT3) and contemplating, "*what can I learn from them?*" (YT4).

In contrast to their external role being a barrier to the development of trusting relationships, intervention facilitators were keen to utilise this role to establish different relationships with pupils, distinct from pupils' relationships with their existing professionals:

> *"Their teacher is their teacher, and they have to shout at them sometimes, and discipline them, they have to teach them things. I come in with a… it's a peaceful space, my attitude to them is already mindful when I arrive. Therefore, their attitude to the whole lesson is affected by me, it changes because it's me standing there and not their teacher."* (MT2)

Intervention facilitators distinguished themselves in many ways, including asking pupils to refer to them using their first name and sharing details about themselves and their lives. This level of openness led to intervention facilitators appearing more "*approachable*" (YT3) to adolescents. In the same way intervention facilitators shared things about themselves with pupils, they also aimed to get to know the pupils throughout the ten weeks. Intervention facilitators specifically reflected on the value of learning the

names of pupils as a way of building relationships; *"it makes a difference…automatically you have a connection and a recognition"* (MT4).

In getting to know adolescents better, facilitators felt that it was essential to "*meet them where they are at*" (YT3) and adapt to the needs of adolescents. This approach was believed to communicate kindness and empathy, stemming from a genuine interest in pupils. As such, participants described the mutual respect that was present, with equal respect between intervention facilitators and adolescents:

> *"Just because I'm the adult, it does not mean that they owe me any more respect than I owe them…The only difference between [them] and me is that I've lived on this Earth a bit longer and I've, maybe, seen a bit more, but not necessarily so. Some of these kids may have seen more than me."* (MT3)

Furthermore, intervention facilitators also differentiated themselves from other adults in adolescents' lives by adopting a non-reactive approach with pupils. Intervention facilitators described how adolescents were used to being "*shouted*" (MT4) at in their lives and they strived to maintain a non-reactive and calm atmosphere within classes. Nevertheless, intervention facilitators did note how challenging this was at times and relied on their training in yoga and mindfulness to remain calm.

In addition to getting to know pupils and maintaining a non-reactive approach, intervention facilitators also described the importance of positive reinforcement techniques to build relationships with adolescents. This included giving pupils praise for listening and engaging with lessons. Therefore, intervention facilitators rewarded positive behaviour instead of "*calling out bad behaviour or negative actions*" (YT2). These positive reinforcement strategies were believed to create a "a *safe environment*" (MT3).

Taking all of these strategies together, school staff noted that intervention facilitators had managed to build "*good relationships"* (Lead) with pupils in a short space of time, commenting on their "*patience, support, and encouragement"* (YFT1).

8.2.2.2 Collaboration with School Staff. Intervention facilitators strove to develop collaborative working relationships with school staff to help manage the class. Intervention facilitators relied on school staff to lead on behavioural management so that they could concentrate on teaching the *"skills"* (Lead) they were there to teach. Where this worked well, intervention facilitators felt "*supported"* were very *"grateful to them for jumping in and bringing the room down"* (YT2).

Despite this, school staff expressed frustration that they felt like a *"sergeant"* (MFT2) and interruptions were "*unconducive to the atmosphere in the room of calm and focus"* (YFT2). There was also frustration expressed from by intervention facilitators, where some felt that school staff could be "*too disciplined"* (MT1) at times. As such, there was a fine balance in the behavioural management of the class owing to each skills of both professionals, which took time to develop. One intervention facilitator reflected on this process:

> *"[School staff] did step in a few times. I didn't want to tell them to not do that. It's like, 'You've done your bit. I'll do my bit.' Again, you'll tell them to stop and, 'Miss is trying to talk. Can you be quiet?' And that's not working. I'll stand still and be quiet. That's not working. Then we'll do it both again and it will work, and who knows which one was right? There is no firm rule."* (MT4)

Nevertheless, all intervention facilitators reflected that without a school staff member in the room, the class could be "*uncontrollable"* (MT2), pointing to the importance of collaborative working between intervention facilitators and school staff to support pupils to engage with the content. Central to this was developing open communication channels and a "*shared understanding"* (YFT2) between school staff and intervention facilitators about their different roles within the classroom. Moreover, this division of responsibilities had to be communicated to pupils to avoid confusion about who was leading the class.

When considering the influence of school staff over the class, intervention facilitators also highlighted the value of school staff participating in mind-body

interventions alongside pupils. Professionals reflected that "*it was huge for the kids to see that*" (MT1) as it allowed them to "*see an adult being willing to have a go…it gives them permission to have a go and put themselves in a potentially vulnerable situation*" (YT4). Watching their schoolteacher who they knew and trusted practice yoga or mindfulness positively influenced adolescents' engagement. One schoolteacher reflected on this:

> "*At the beginning, they were making me fun of me. Not in a bad way, in a nice way, like, 'Oh, Miss is doing it. Miss is doing it. Oh, it looks like she's stretching'. At the end, when I was doing it and someone was talking, I was looking at them and I was like, 'Please, I want to do it. Respect me and my time – that I do want to yoga'. They were like, 'Sorry, Miss', and they would just keep on and doing yoga.*" (YFT4)

School staff who were able to engage in the interventions had positive experiences, describing how "*it was a moment for me to just sit back and enjoy, and to take part in what the students were, so I could have the same experience*" (MFT1). It also helped school staff to see their class differently and "*find out about them and how they view the world*" (YFT1), which was seen as a positive. Nevertheless, there were mixed experiences of school staff practising alongside the class; some used the time to "*take notes*" (MT4) or "*mark*" (MT1), whilst others had injuries that prohibited their participation (in yoga intervention classes). Furthermore, other school staff did not feel able to participate, resulting from their focus on behavioural management: "*I was more the behaviour person rather than engaging or participating*" (MFT2).

8.2.3 Practical Considerations

8.2.3.1 Pupil Attitude and (Mis)Behaviour. Given the universal nature of intervention delivery, there were specific challenges relating to the varying levels of pupil engagement within interventions: "*some of the students were very keen and some of the students were not… some refused to participate*" (MFT3). These pupils ran the risk of "*ruining*" (YT2) the experience for the more engaged pupils. Most pupils who did not want to engage did so non-disruptively, "*sitting quietly*" (YT3). Nevertheless, there were

instances where pupils were more disruptive and encouraged others to misbehave. As such, participants described the importance of "*setting expectations*" (MFT1) and having boundaries, making it clear what adolescents were and were not expected to do. However, there was a "*fine line*" (YT3) between delivering the class that intervention facilitators had planned and respecting adolescents' choices, giving them "*freedom*" (MT3) without being considered a "*pushover*" (YT2). One intervention facilitator reflected on the tensions between setting boundaries and maintaining an invitational approach:

> *"There was one girl who was always turning round. In the end, I said, 'Look, just don't turn around. If you're bored, just sit with your head down and let me do 45 minutes. Just don't keep turning around distracting the other person for me'. This was like meeting them where they were. And she was cool with that."* (MT4)

There were mixed views as to how to manage students who were being disruptive and whether "*removing*" (Lead) them from class was the best option. This view was favoured by school staff to give pupils who wanted to engage the opportunity to do so uninterruptedly. In contrast, intervention facilitators were more likely to want to continue to include pupils in the class, in line with the inclusive ethos of wellbeing classes:

> *"The class teacher had said to me that she didn't want her back in. I felt that that was the wrong way to go about it. I expressed that actually that would be rejecting her from the group when the whole process of this is to enable them to feel better about themselves and to give them tools to help such behaviours."* (YT3)

There was a view that behaviour within classes was further affected by the presence of an external professional, especially at the beginning of the ten weeks. Professionals described how pupils may have acted out to see if they could "*get away with*" (YFT1) behaviours that would normally have consequences. In other words, they were "*testing*" (YFT3) the "*boundaries*" (MT4) of the intervention facilitators. Subsequently, if external intervention facilitators were not "*aware of the school [behavioural] procedures*" (MFT2), pupils may misbehave in the knowledge that they would not face the usual sanctions. For external facilitators to feel "*empowered*" (YFT2)

to manage behaviour, school staff recommended that intervention facilitators be informed about the behavioural policies and sanctions within the school.

Lastly, the disruption to the routines for those participating in the yoga intervention in a different classroom and different layout (e.g., mats rather than chairs) was further described as affecting behaviour. School staff spoke of the importance of adolescents' routines and habits, noting that "*any change in routine*" (YFT2) negatively affected behaviour. Subsequently, participants reflected that yoga classes could be "*quite a strange lesson*" that was out of adolescents' "*comfort zone*" (Lead). Consequently, participants spoke of increased levels of misbehaviour in yoga, in comparison to mindfulness intervention classes.

8.2.3.2 Intervention Curriculum Inclusivity. Another practical consideration that participants raised concerned the inclusivity or appropriateness of the intervention curricula for the specific demographics of the adolescents in the current study. As previously described, the school was situated in an area of high deprivation and the sample was made up of a largely pupils from BAME backgrounds.

Within the mindfulness .b intervention curriculum, intervention facilitators noted that the original curriculum had been designed and developed with children and adolescents in *"more privileged"* (MT1) areas. Subsequently, in teaching the curriculum to a highly diverse and deprived urban mainstream school, aspects of the material were not relevant to this population. One of the comparisons made to describe the attention of adolescents was the 'puppy-mind', however, the mindfulness intervention facilitators noted that this idea did not resonate with the pupils in this school:

> *"The phrase the 'puppy mind', didn't work with the kids that didn't have puppies or dogs. If I'm teaching out of London, you'd have everyone relating to a puppy. So [in this school], I chose a toddler…. It's a concept that they got because they have little brothers or sisters, and some came from quite big families with lots of cousins. So, they related to that, but not the puppy."* (MT1)

Similarly, there was a mindful eating activity that involved chillies as a negative stimulus and chocolate as a pleasant stimulus, which was designed to encourage adolescents to pay attention to the sensations that these evoked. However, the large proportion of adolescents from BAME backgrounds were "*familiar*" (MT2) with the taste of chillies and spicy sensations, and therefore the 'negative' stimulus "*didn't really work in that demographic*" (MT2) as it did not evoke the intended reactions. Consequently, the mindfulness intervention facilitators adapted this to using lemons as the unpleasant stimuli in Year Two, which was more effective in eliciting the desired response. As can be seen in these instances, intervention facilitators chose to omit or adapt aspects of the curriculum to suit the needs of the population. Still, they noted that that curriculum could be amended to include these more inclusive alterations as opposed to relying on the individual judgement of intervention facilitators.

Furthermore, challenges were raised in relation to the Yoga4Schools intervention curriculum. Some intervention facilitators described how they found female participants harder to engage in yoga intervention classes. School staff reflected that this may be due to cultural factors:

> "*In our school, a lot of the girls come from a cultural background, where doing a sport or engaging in something like Yoga wouldn't be seen as necessarily appropriate for a girl.*". (YFT3)

Additionally, the difficulty of some of the poses (asana) was raised by some facilitators, who were surprised by the limited flexibility of adolescents: "*I always expect young people to be more in shape and flexible than they are*" (YT2). As such, some of the original postures included in the curriculum required further adaptation to cater for these needs.

8.2.3.3 Physical Environment and Logistics. There were logistical challenges in the delivery of mind-body interventions within the school context, specifically related to

class size and set-up. Regarding the class size, all intervention facilitators in Year One stated that these classes were the biggest they had taught and, subsequently, they were *"difficult"* (YFT2) to manage. Smaller classes were adopted in Year Two; professionals involved across both years of intervention rollout described how this had a "*huge impact*" (YT2) and *"made a real difference"* (Lead) to the dynamics within the class, allowing "*more one-to-one contact with the teacher*" (MFT3). However, it also led to additional challenges for the school in terms of staffing additional classes, which should be considered within intervention implementation.

The number of pupils in the room also led to spacing and layout issues. Pupils' normal classrooms were utilised for the mindfulness interventions; however, some classrooms were small and "*confined*" (MT2), which professionals did not find conducive for engaging with pupils. Bigger classrooms would allow adolescents to practice mindfulness "*in their own bubble…it's very hard to practice in your own bubble when you're elbow to elbow with the student beside you*" (MT3). Similarly, for the yoga groups, which took place in drama studios, there was a general view that more space was needed as pupils were "*too close to each other*" (YFT1).

The debate regarding the appropriateness of mixed-gender mind-body intervention classes was also raised by participants[60]. School staff noted that *"best practice is not to split up boys and girls*" (Lead). However, there were concerns that "*girls are not comfortable in the same space as boys*" (MT3) or that they both "*feel embarrassed to do something different in front of each other*" (YFT4). Furthermore, professionals noted gender differences in terms of engagement, where what "*boys typically responded to and what the girls typically responded to, were different*" (YFT2). As such, this presented challenges for engaging both male and females in larger classes than normal:

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[60] School staff highlighted pupils stay relatively mixed up until Year 10 and mixed-gender PE. and PSHE classes were not unusual.

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"The girls tend to be a little bit better behaved, but less engaged... whereas the boys are louder and more boisterous, but they are more engaged in the physical stuff – maybe the girls would have been a little bit less hesitant to get involved if the boys hadn't been there." (YT2)

In addition to challenges with class size and the set-up of mixed-gender classes, participants also reflected on the timing of intervention classes (second period on Monday mornings). On the one hand, it was a "*good chance*" (YFT1) to start the week off focusing on adolescents' wellbeing and grounding them as they prepared for the week ahead. On the other hand, adolescents may be more likely to be tired and distracted on Monday mornings, and not "*in the right frame of mind*" (YT1).

Lastly, in relation to the logistical aspects of yoga intervention classes, participants reflected on the most appropriate dress code for yoga practice. Pupils practising in their usual uniform (with small alterations[61]) ensured maximum time in class, but it was acknowledged that this could be "*uncomfortable*" (YFT4), and some pupils commented to school staff that they were worried that they would "*rip their trousers*" (YT4). Nevertheless, practicing in their usual clothes helped to signal that "*they don't need a special kit, they can do it anywhere*" (YT2).

8.2.4 Intervention Exposure and Sustainability

8.2.4.1 Seeing the Benefits for Pupils. The breathing exercises were key for enabling these perceived benefits: "*they just got the idea that you can breathe and that breathing will help you*" (MT2). Professionals believed that the pupils who took part in yoga and mindfulness interventions had "*better self-regulation*" (Lead) skills than those who participated in PSHE as usual. School staff commented on instances where pupils utilised these skills to better regulate their emotions and behaviours to avoid getting into disputes with peers, getting in trouble with teachers, and generally coping in class:

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[61] Pupils could untuck their shirts, take off their ties, and generally alter their uniform to feel more comfortable. Females could also change into their PE kit in the break before class if they felt more comfortable doing so.

> *"One of my kids got in a fight with another kid and I got to him and said look you need to do what you did in mindfulness, and he would think to himself, I need to put my feet on the ground, I need to do this."* (MFT2)

In addition to these examples of coping strategies, there were felt to be significant changes in classroom dynamics, indicative of increases in openness and engagement with the interventions. Towards the end of the ten weeks, there was a view that pupils felt more settled in their routines, were participating more in the activities, and were *"a lot more focused"* (MFT1) on the content. In yoga intervention classes, intervention facilitators commented on the increases in the time that pupils could spend in relaxation (savasana). As well as the length of time, facilitators felt that the *"quality"* (YT4) of the silence within that time also improved:

> *"In the beginning, they could not stay still. We barely achieved two, three seconds of quiet or stillness to, in the end, them fully participating. That blew me away. It is pretty hard for a teenager to stay still and then an element of vulnerability of lying flat on the floor with your peers. Just allowing yourself to just 'be' for a minute when the rest of your day is probably in quite an aroused state, I was super impressed."* (YT3)

Whilst the mindfulness intervention facilitators did not give such tangible examples, there still was a prevailing view that pupils "*settled into their practices*" (MT2) in a similar way to yoga pupils settling into savasana. They also become more comfortable with the silences necessitated by the breathing exercise, showing progression. Furthermore, pupils were more engaged in answering questions, contributing to the discussions, and there were fewer behavioural disruptions.

Given the increases in engagement throughout the ten weeks, intervention facilitators felt more confident that they had made a difference when they could "*see the penny drop into the pupil's mind and see the smile or the glint or the appreciation*" (MT4). Despite this, professionals reflected that they could never know the true extent of the impact on pupils but hoped it had been positive and some would continue their practice after "*recognising the benefits*" (MT3).

8.2.4.2 "It Comes and it Goes Very Quickly": Optimising Exposure. At the end of the interventions, there was an overwhelming view that ten weeks was "*not enough*" (MFT3). Consequently, participants described any benefits as relatively short-lived, where "*it comes and goes very quickly*" (YFT1). To "*consolidate*" (YFT3) any benefits, consistency was identified as key for adolescents to practice wellbeing skills. However, in reality, professionals described how they "*did it for ten weeks and then nothing…it's completely gone*" (MFT2) and there was "*no follow up*" (MT3). However, there were no formal avenues "*embed*" (MT3) practices after the classes ended. School staff had made efforts to integrate some of the practices into their tutor periods in the hopes of helping pupils to practice and sustain these skills. Despite the best of intentions, these practices were integrated on an ad-hoc basis, dependent on individual members of school staff. Subsequently, some members of school staff wanted to be trained in mind-body activities, such as the breathing exercises, which they could use with their classes for "*5 minutes or 10 in tutor time*" (MFT3) or "*stop and breathe every time the bell rings*" (MT3) to increase exposure. This would help to ensure practices became more embedded in the everyday routine of adolescents[62].

Nevertheless, there were debates regarding the most appropriate facilitator of these specialist wellbeing techniques, where advantages and disadvantages to internal versus external delivery methods were reflected upon. In favour of internal teachers, participants noted that schoolteachers had a pre-existing relationship with pupils and could maximise exposure through tutor times and other lessons. Furthermore, training internal school staff was a more "*sustainable*" (Lead) model of delivery. In contrast,

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[62] Whilst this approach was adopted in Year Two in place of the home practice element of the curriculum, school staff did not engage with this in a consistent way. This may be due to lack of time in form periods and/or lack of confidence in leading the breathing exercises with only one half-hour training session.

school staff were described as "*stressed*" (MT2), which may not be conducive to the non-reactivity valued by pupils. Professionals reflected on both arguments:

> *"I don't know how a class teacher would feel about switching between normal teaching and teaching Yoga [or mindfulness] because of the tone you need to set, you need to adopt. Having said that, it's got lots of benefits because of the familiarity; they know the students already and probably are able to serve them better if you have built up a relationship with them."* (YT2)

In addition to reflections about the facilitator, universal versus targeted delivery methods were also considered. Participants deliberated on the value of lunchtime or afterschool yoga and mindfulness "*clubs*" (MFT2) for pupils to attend voluntarily. These clubs were identified as allowing "*interested*" (YFT1) pupils to practice in a supportive environment as a way of sustaining practice. Nevertheless, the benefits of universal delivery methods within the curriculum were also championed as having "*huge potential*" (YT2). These universal methods exposed more adolescents to the potential benefits of yoga and mindfulness interventions, increasing the accessibility of interventions:

> "*I think the advantage of doing it in a whole group is that nobody is singled out, that yoga [or mindfulness] is for everyone and that it is a therapeutic wellbeing tool that is there for each and every one of us, no matter what your circumstance or background.*" (YT3)

Thus, both universal and targeted approaches were identified as "*complementary*" (YT3) strategies for sustaining intervention classes within the school context. In adopting both approaches, it would ensure that as many pupils were exposed to these interventions as possible through universal approaches but also overcome many of the barriers present in universal classes through a more targeted approach.

8.3 Discussion

Within the qualitative data from interviews with professionals, four overarching themes were identified regarding the implementation of yoga and mindfulness interventions: 1) Drivers of implementation, 2) Building trusting relationships, 3) Practical considerations, and 4) Intervention exposure and sustainability. These themes

elucidate enablers and barriers to effective implementation and delivery of yoga and mindfulness interventions within the school curriculum. Key facilitators and barriers in relation to each theme are summarised in Table 35.

Understanding the facilitators and barriers to implementation is fundamental to advancing both the research field and the practical application of yoga and mindfulness interventions in schools. This is important as simply adopting a high-quality intervention alone does not guarantee the effectiveness of the intervention. Instead, research has repeatedly highlighted that the quality of implementation has considerable effects for implementation, sustainability, and student outcomes (Durlak et al., 2011; Durlak & DuPre, 2008; Greenberg et al., 2005). Moreover, further consideration of these factors has been called for by mind-body researchers as a way of advancing the field (Zenner et al., 2014). Therefore, the current findings provide learning for other settings to consider when implementing, adapting, and delivering yoga and mindfulness interventions in the school context.

Table 35. *Overview of the Facilitators and Barriers of Intervention Implementation and Delivery*

	Drivers of Implementation	Building Trusting Relationships	Practical Considerations	Program Exposure and Sustainability
Facilitators	• Concern for pupils' mental health • Increasing rates of mental health issues • Local context of crime • Positive attitudes and aspirations regarding effects of mind-body interventions	• Positive teacher-student relationships • External professionals • Positive teacher-facilitator relationships and communication • School staff buy-in and active participation • Pupil engagement and enjoyment	• Routines and setting expectations of pupils • Sufficient space • Smaller classes • Inclusive curriculum	• First-hand observation of pupil enjoyment and benefits • Desire to sustain skills • Staff buy-in and commitment
Barriers	• Wellbeing seen as a specialist skill • Funding cuts • Resources and staff capacity	• External professionals • Lack of communication between intervention facilitators and school staff • Lack of buy-in and active participation from school staff • Lack of pupil engagement/enjoyment	• Unclear expectations of students • Limited knowledge of school behavioural policies • Limited space • Larger classes • Mixed-gender classes • Universal delivery (mixed engagement) • Inappropriate curriculum content	• Programme length • Lack of clarity on future direction and implementation (universal vs. targeted) • Resources and capacity • Funding

8.3.1 Drivers of Implementation

Firstly, the motivation and driving force behind the current schools' decision to implement mind-body interventions within the school context were considered. Arguably, these factors may be some of the most important enablers in adopting wellbeing classes within the curriculum, reflecting buy-in from school staff and a perception that yoga and mindfulness may be beneficial for adolescents. Those who worked with adolescents expressed concern about the increasing rates of mental health and wellbeing problems, which were borne out in recent statistics. Indeed, 13% of children and adolescents aged 5-16 years old were identified as having a probable mental health disorder in 2017 (Sadler et al., 2018), which had increased since the previous survey in 2005 (Green et al., 2005). These increases were particularly salient for low SES populations; children and adolescents with mental health problems were twice as likely to live in households that had fallen behind in their finances (NHS Digital, 2020), which is arguably more likely in a highly deprived area, such as the setting in the current study.

Set against this backdrop, schools did not see themselves as providing adequate support for the mental health and wellbeing of adolescents, largely due to decreases in funding and resources in recent years. Nearly three-quarters of schools reported financial barriers in their efforts to introduce mental health and wellbeing provision (DfE et al., 2017). A further half of schools cited a lack of internal capacity, such as limited staff time or availability, as a further barrier to provision (DfE et al., 2017). Taken together, decreases in funding and staff resources have taken a toll on the ability of schools to support the mental health and wellbeing of pupils. Therefore, when the school in the current research was given the opportunity to implement mind-body interventions, this was met with overwhelming positivity. School staff described their hopes for positive effects on the wellbeing of adolescents, hoping for improvements in self-regulation,

strategies to manage stress and anxiety, and academic engagement. Based on their prior experiences, intervention facilitators shared these aspirations and described the mechanisms of change that they hoped would help adolescents achieve these benefits. These anticipated benefits were in line with the findings of previous literature exploring school-based yoga and mindfulness interventions (Bergen-Cico et al., 2015; Daly et al., 2015; Huppert & Johnson, 2010; Kuyken et al., 2013; Schonert-Reichl et al., 2015).

Positive beliefs, such as these, have been shown to support intervention implementation, whereas negative beliefs or misconceptions about yoga and mindfulness hindered adoption of these interventions (Wilde et al., 2019). More specifically, if school staff believed that the interventions would positively affect adolescents and the classroom environment, the interventions were more likely to be implemented more successfully (Dariotis et al., 2017). Hudson et al. (2020) elaborated on this, noting that successful implementation was grounded in school staff's perceptions of compatibility between the purpose of the intervention and the needs of pupils (i.e., increasing mental health problems) in the face of cuts to funding and resources. Thus, these motivating factors set the context for implementation in the current study and echo the motivating factors observed in previous research (Durlak, 2016; Hudson et al., 2020). Such factors apply to other urban mainstream schools, who may also have concerns about the mental health and wellbeing of pupils, in the search for finding appropriate support.

8.3.2 Building Trusted Relationships

In addition to the drivers of implementation, professionals reflected on the fundamental importance of building trusting relationships between intervention facilitators and pupils, and between intervention facilitators and other members of school staff. Regarding relationships with adolescents, there was an acknowledgement that external intervention facilitators could both facilitate and hinder these relationships.

Participants described how adolescents could be wary of new people and generally had a distrust of strangers, which could initially act as a barrier to forming relationships with external professionals. This distrust is consistent with general theories of adolescence, which is considered a time of hypersensitivity to negative self and peer judgement (Bluth & Blanton, 2014; Neff & McGehee, 2010). In this period, adolescents may be more attuned to the intentions and perceptions of others (Blakemore & Mills, 2014), where judgements about the intentions of others may be skewed towards more negative perceptions (Bird et al., 2019), which could explain why adolescents may be sceptical towards new teachers.

Nevertheless, intervention facilitators were committed to investing time to build positive relationships with adolescents, and this was echoed in pupils' favourable ratings of intervention facilitators (see Chapter 6, Section 6.3.3). Intervention facilitators tried to build rapport and trust with adolescents through different strategies, including adopting a non-judgemental approach, getting to know adolescents personally, sharing details about themselves and their lives, and engaging in positive reinforcement techniques to praise adolescents' engagement and behaviour. The importance that interventions facilitators placed on developing rapport and trust within the classroom were purposeful strategies adopted to cultivate positive relationships with adolescents. Previous research has highlighted that strong socio-emotional competencies displayed by the teacher are associated with better teacher-student relationships in the delivery of socioemotional interventions (Frank et al., 2013; Jennings et al., 2013; Jennings & Greenberg, 2009). Within this, teachers' skills in socio-emotional competencies were also positively associated with student outcomes, suggesting the importance of strong training and a sustained personal practice (CASEL, 2015; Grant, 2017; Greenberg et al., 2005). This is consistent with the PSCMM (Jennings & Greenberg, 2009), which provides a model for

the importance of teacher qualities and how these may impact classroom experiences, and outcomes (see Chapter 7, Section 7.3.2).

Within the relationship between facilitators and adolescents, the extent to which the demographic characteristics of the intervention facilitator reflected the demographics of the class (including gender and ethnicity) has been highlighted as impacting the teacher-pupil relationship. Dariotis et al. (2017) noted positive teacher-pupil relationships and hypothesised that this might be due to the male intervention facilitators from ethnic minority backgrounds, who were seen as more relatable and trustworthy by the largely BAME intervention participants. In contrast, when the demographics of the intervention facilitators were not reflective of the demographics of the class, Miller et al. (2014) raised concerns that white female facilitators may not be "perceived as relevant" (p. 176) to adolescents from BAME backgrounds. Nevertheless, the current findings highlight that relationship-building between intervention facilitators and adolescents is more complex than demographics alone. Instead, many factors impact the teacher-pupil relationship; arguably most importantly, an authentic and genuine presence when interacting with adolescents (Miller et al., 2014).

In addition to building positive relationships with students, intervention facilitators also strove to develop positive collaborative relationships with school staff, recognising their influence on the classroom. Positive working relationships were seen as both professionals having clearly defined roles and responsibilities, having a shared understanding of the behavioural management strategies within the class, and encouraging joint participation. The importance of collaborative relationships between intervention facilitators and school staff was also raised in previous research (Dariotis et al., 2017; Joyce et al., 2010; McKeering & Hwang, 2019; Mendelson et al., 2014). The professionals in Dariotis et al.'s (2017) research expressed a desire for more frequent,

timely, and "open communication" (p. 61) between intervention facilitators and school staff regarding adolescents' behaviour, attendance, and progress within the classes. Indeed, communication was cited as a critical driver for implementation; school staff who were not well-informed about the intervention classes were generally less supportive of the implementation process (Mendelson et al., 2014). In contrast, effective communication practices were important for motivating school staff to support intervention facilitators in programme delivery (Dariotis et al., 2017). Therefore, open channels of communication were integral for effective implementation. More specifically, these helped to identify any barriers to implementation in real-time, which meant that any issues could be addressed promptly. Despite the importance for implementation, both intervention facilitators and school staff acknowledged communication barriers, mainly due to time limitations. School staff had multiple demands on their time and resources (Mendelson et al., 2014), which reduced the time available to communicate about intervention sessions. Nevertheless, the importance of building relationships between the key stakeholders in the delivery of school-based interventions should not be underestimated and may be considered a key factor within implementation effectiveness.

8.3.3 Practical Considerations

Thirdly, practical considerations centred around adolescents' attitudes and behaviours, the inclusivity of the intervention curricula, and the appropriateness of the physical environment and setting. Regarding adolescents' attitudes and (mis)behaviour, the universal delivery method raised challenges as some pupils were more willing to engage than others, creating disturbances for other, more engaged, pupils. Consistent with the current study, past research has demonstrated that professionals do not always know how to manage pupils who do not engage well (Joyce et al., 2010). Considering this, there

were mixed views on how to manage disturbances caused by these pupils, where intervention facilitators and school staff generally disagreed as to the best course of action in allowing pupils to remain in class or removing them. Mendelson et al. (2014) also raised this discrepancy in behavioural procedures and noted that school staff sometimes held pupils back from attending class or removing them from class as a form of punishment. This raises questions about the best behavioural management approaches.

Harsh behavioural policies such as shouting, ordering, and removing pupils from the classroom went against the atmosphere that intervention facilitators were trying to build within the classroom. Instead, research has shown that individuals respond more positively to assertive, yet calm, behaviour management strategies (Grant, 2017; McPherson et al., 2003). This is consistent within the PSCMM, where more socio-emotionally competent teachers demonstrate increased use of positive emotional and verbal expressions to better manage behaviour (Jennings & Greenberg, 2009). In approaching disciplinary situations from this standpoint, intervention facilitators adopted behavioural management techniques that promoted the intrinsic motivation of adolescents to participate and coach them through conflict situations (Jennings & Greenberg, 2009). In doing so, intervention facilitators acted as role models, modelling the concepts they were teaching in terms of remaining calm, non-reactive, and respectful in their communication towards adolescents. This style of behavioural management is associated with improved classroom environments characterised by low levels of conflict and disruptive behaviours, which are more conducive to wellbeing interventions (Jennings & Greenberg, 2009; Solomon et al., 2000). Thus, there appears to be a degree of tension between developing positive relationships and using discipline in a fair way that maintains classroom order, but does not damage relationships. This tension may be heightened when school staff take on responsibility for behavioural management within

mind-body classes, which may be more reactive, perpetuating a cycle of disruptive behaviour within the classroom environment (Jennings et al., 2013; Jennings & Greenberg, 2009; Osher et al., 2007).

In addition to behavioural factors, there were also practical considerations relating to the appropriateness and inclusivity of the intervention curricula. Intervention implementation is affected by the quality of intervention materials (Dariotis et al., 2008). However, in the literature to date, limited attention has been given to the appropriateness of the intervention content. What has been conducted has generally considered the age appropriateness of intervention programmes, particularly for child and adolescent cohorts (Cook-Cottone et al., 2018). However, the current study has raised a novel consideration in terms of appropriateness. Considering the demographics of the current sample as largely adolescents from BAME backgrounds and living in areas of high deprivation, there were elements of the intervention programmes that hindered effective delivery of certain activities.

For the MiSP's .b curriculum, the cohorts that the intervention was designed and tested with may have contributed to this. Three developers designed the intervention, two of whom were teachers in independent, fee-paying, schools in England (Simpson, 2017). The curriculum was subsequently piloted with adolescents who attended fee-paying independent schools (Huppert & Johnson, 2010). In addition to the difference in school setting and the implicit difference in SES of the participants, there were also further dissimilarities. More specifically, Huppert and Johnson's (2010) sample comprised male participants only and the ethnicity of the sample was 95% White Caucasian, which contrasts with the mixed-gender, multi-ethnic, cohort in the current study. Whilst research is ongoing, widening the sample that the .b intervention has been tested with (e.g., Kuyken et al., 2013), research has recommended increasing the diversity of the schools in which

the intervention is implemented to improve the generalisability of the impact of the .b curriculum. Such work may highlight further adaptations that are required to ensure acceptability to a more diverse population.

Whilst the Yoga4Schools curriculum was designed with the diversity of adolescents as a primary consideration, professionals also raised cultural issues that may have affected engagement. Professionals specifically described limited engagement from female adolescents, possibly due to cultural or religious factors. Participating in physical activity at school has been highlighted as an issue for female students, particularly for those wearing hijabs in Western schools (Dagkas et al., 2011). Therefore, limited awareness regarding cultural or religious requirements may hinder some adolescents' ability to fully participate in school-based mind-body interventions (Alamri, 2013; Qureshi & Ghouri, 2011).

Considering some of the exercises and activities included in the intervention programmes were not appropriate or effective in eliciting the intended response, intervention facilitators adapted these to align with the needs of the adolescents in the current sample. As such, it was integral that the intervention facilitators were experienced, knowledgeable, and culturally-competent in working with the sample population (Dariotis et al., 2017). With this knowledge and experience, intervention facilitators were able to adapt practices on an ad hoc basis to elicit the intended experience or response from the content. Such adaptations and adjustments are considered likely, even necessary, in the development of school-based interventions (Durlak, 2015) and have been reported in other research exploring the impact of .b specifically (McGeechan et al., 2019). Consequently, this points to the importance of assessing the experience and key competencies of intervention facilitators within recruitment procedures to enable appropriate adaptations when required.

In addition to these barriers, there were also practical in-class issues regarding the physical environment where the intervention classes took place. One of the most common barriers cited by existing research and the current study was logistics, including sufficient spacing within schools to host wellbeing classes. For yoga in particular, adolescents need enough space to stretch out without touching each other (Cook-Cottone et al., 2018; Wang & Hagins, 2015). However, spacing issues were not unique to yoga classes; the usual classroom environment may also not be conducive to mindfulness classes (Arthurson, 2015). Research has suggested that the usual classroom layout may hinder inward-focused attention and reflection (Mendelson et al., 2014) as pupils were "virtually on top of each other" (Arthurson, 2015, p. 36), serving to increase their self-consciousness. These practical barriers have been reported in previous school-based implementation research, with multiple reports of limited space (Chen & Pauwels, 2014; Cook-Cottone et al., 2018; Dariotis et al., 2017; Mendelson et al., 2014; Miller et al., 2014; Wang & Hagins, 2015), lack of privacy (Dariotis et al., 2017; Mendelson et al., 2014; Miller et al., 2014), and excessive noise (Dariotis et al., 2017) in the allocated practice spaces.

Nevertheless, the logistical barriers surpassed purely spacing issues. Research has highlighted how room setup and layout may affect the willingness of adolescents to engage (Joyce et al., 2010; Miller et al., 2014). Adolescents may be more likely to engage in mind-body interventions when the classroom is conducive to facilitating a relaxing environment (Arthurson, 2015; Joyce et al., 2010). Therefore, in future, consideration should be given to facilitating a more calming and comfortable classroom environment. Past research has suggested functional changes such as decorating rooms with peaceful forest or ocean scenes (Arthurson, 2015; King & Chantler, 2002). Additionally, Arthurson (2015) suggested the potential for a dimmer function on the lights to darken the room for the meditative and relaxation practices, which may help to reduce level of

self-consciousness. However, room and funding restrictions within schools should be taken into account when considering these recommendations.

In addition to spacing and layout issues, participants also questioned the appropriateness of mixed-gender mind-body intervention classes, specifically yoga, given the types of movement involved. This presumption is in line with general theories of adolescence that suggest that adolescents are highly self-conscious about their body and how their peers perceive them, particularly members of the opposite sex (Eccles et al., 1993). The debate about mixed-gender classes was also raised by Miller et al. (2014), who noted unique dynamics in mixed-gender yoga classes absent in other lessons. Whilst Miller et al. (2014) noted that all behaviour was age-appropriate, the researchers were aware how these dynamics could be perceived by adolescents who may have been exposed to physical or sexual abuse or who may be especially vulnerable (Joyce et al., 2010). As such, Miller et al. (2014) recommended adaptations to the room set up (e.g., set up ensuring no one is behind anyone) to minimise gender interactions and the importance of hiring appropriate and qualified intervention facilitators who are experienced and attuned to the needs of adolescents. Moreover, it emphasises the necessity of the invitational environment within classes, which helps facilitate a trusting and safe classroom (as raised by adolescents as a critical factor in their engagement; see Chapter 7, Section 7.2.2).

Professionals in the current study further reflected upon the most appropriate time within the school day and week to integrate yoga and mindfulness interventions for optimal engagement and impact for adolescents. The timing of the class within the school day both positively and negatively affected engagement, dependent on the individual adolescent, the dynamics of the class, and their broader circumstances outside of school (Butzer, LoRusso, Windsor, et al., 2017; Conboy et al., 2013; Cook-Cottone et al., 2018).

Nevertheless, within the current study, interventions were held as a part of the school day, which other researchers have deemed necessary in facilitating engagement (Mendelson et al., 2014). Indeed, reduced engagement and attendance has been found when the interventions clash with other classes that adolescents enjoy (e.g., PE; Butzer, LoRusso, Windsor, et al., 2017; Conboy et al., 2013; Mendelson et al., 2014), when they reduce adolescents' lunch period (Mendelson et al., 2014), or when they occupy a period outside of the school day (e.g., afterschool club; Conboy et al., 2013). Therefore, whilst some professionals may perceive a different period in the school day or a different day to be the optimal time, the fact that adolescents did not miss out on other classes or their own time to participate was beneficial for engagement.

8.3.4 Sustainability

Lastly, the theme of programme exposure and sustainability focused on the value of sustaining any benefits beyond the ten-week interventions. All participants commented on the benefits they observed in pupils, which echoed pupils' own accounts (see Chapter 7, Section 7.2.3). However, there was an overwhelming view that ten weeks was insufficient to sustain these benefits for long-lasting change. Participants shared this view in previous research, where it has also been suggested that the length of the programme was not long enough to "ensure internalization of program skills" (Dariotis et al., 2017, p. 63). Instead, school staff requested continuation of the practices to help adolescents sustain the skills they had learned and embed them more holistically. For instance, this may include integrating breathing and grounding exercises, seated yoga asana, or relaxation exercises into other parts of the school day such as tutor time or form periods. This suggestion was also proposed by teachers interviewed by Dariotis et al. (2017) and Mendelson et al. (2014), who were similarly willing and motivated to find ways to continue to integrate mind-body practices into the school day.

However, there were challenges related to funding and capacity limitations within the school context, which hindered decision making for future plans (McGeechan et al., 2019). Whilst funding and resource considerations remained unchanged, senior leadership at the school had seen that the implementation of mind-body interventions was possible and acceptable within the school context and had seen the potential benefits of these for pupils. This may be advantageous for any future implementation efforts as previous research has highlighted the importance of staff buy-in for school-based mental health programmes (Dariotis et al., 2008, 2017; Durlak, 2016; Forman et al., 2009; Herlitz et al., 2020; Hudson et al., 2020; Joyce et al., 2010; Langley et al., 2010; McKeering & Hwang, 2019; Mendelson et al., 2014; Sibinga et al., 2016; Wilde et al., 2019). Indeed, if school leaders "believed in it" (Hudson et al., 2020, p. 9) or were "excited" by it (Langley et al., 2020, p. 109), this was more conducive to success and sustainability (Herlitz et al., 2020). Despite the value of engaged and supportive senior leadership teams, one of the most fundamental factors was simply that they did not "actively obstruct" (Wilde et al., 2019, p. 832) implementation. This suggests that there may be a spectrum of senior leadership support, with anything beyond active obstruction facilitating implementation to varying degrees. Therefore, having seen the possibilities for integrating yoga and mindfulness into the school curriculum and the appetite for it within their school, school leaders may be more likely to be supportive of interventions such as these in the future as they see them as compatible with pupils needs.

8.4 Conclusion

The factors affecting implementation may be considered as existing along a spectrum, with no clearly defined cut-off for effectiveness or success (Durlak, 2016). Nevertheless, these implementation themes were largely consistent with many of the factors highlighted in other mental health and wellbeing interventions and broader school-

based interventions. Specifically, the main enablers for implementation and delivery were related to the perceived needs of the pupils within the context of the schools' ability to meet these and the cultivation of positive relationships between intervention facilitators and students and between intervention facilitators and school staff. Furthermore, setting expectations with fair behavioural management principles, having sufficient resources and space, and inclusive teaching materials were practical and on-the-ground enablers. After implementation of the ten-week interventions, enablers included seeing the benefits in pupils and the willingness of school staff to be open to having conversations about how to best sustain the benefits long-term.

These implementation considerations contribute to future learning regarding the optimal conditions and important considerations when implementing and delivering school-based wellbeing interventions. Therefore, they help to understand any reasons for effectiveness or otherwise of yoga and mindfulness interventions within the current study, acknowledging the influence of process-related factors on adolescents' outcomes. Chapter 9 will integrate the findings from the impact and process evaluations reported in Chapters 6-8 in relation to the overall research questions through a convergence coding matrix.

9. Integration of Mixed Methods Findings: A Convergence Coding Matrix

9.1 Overview of Chapter

Chapters 6-8 reported on the findings generated by the separate quantitative and qualitative methodologies and samples within each aspect of data collection. In line with best practices for integrating quantitative and qualitative data (O'Cathain et al., 2010), all data was triangulated through a convergence coding matrix to assess the degree to which the data agreed or disagreed in relation to the research questions. In exploring all data holistically, this moves away from viewing the findings related to each methodology in isolation and moves towards a more coherent approach, considering the findings as an "integrated whole" (Michaelson et al., 2020, p. 506). This chapter reports on the convergence coding matrices to systematically compare and contrast the data from each method to offer more comprehensive insights and conclusions in relation to the research questions.

9.2 Findings

As described in Chapter 2, there were four overarching research questions, which are each considered in turn below, integrating both the quantitative and qualitative data. Within each convergence coding matrix, there are four possible outcomes for data integration: agreement, partial agreement (complementary findings), dissonance (conflicting findings), and silence (data found only in one data set).

9.2.1 What Impact do Yoga and Mindfulness have on Adolescents' Wellbeing?

In taking the quantitative and qualitative data together (Table 36), there were some instances of agreement and a clear level of dissonance within the data, which requires further consideration.

Regarding disagreements, there was a noteworthy discrepancy between the quantitative and qualitative data in terms of the perceived impact on the wellbeing of adolescents. Using validated measures (pre-post ten-week interventions), the quantitative data showed limited impact of yoga and mindfulness interventions on adolescents' wellbeing, in comparison to a control group. However, this was not borne out in the qualitative data. Instead, adolescents articulated a range of perceived benefits that they had experienced since participating in the interventions, including improvements in their self-regulation, relaxation and calmness, self-confidence, and the development of a more positive mindset. All these descriptions were indicative of positive impacts upon wellbeing, which were also shared in the perceptions of the professionals who interacted with pupils.

Whilst the quantitative data showed dissonance with the qualitative data on wellbeing-related changes, there were some points of convergence and triangulation within the data. Indeed, there was agreement between the short-term wellbeing data (mood pre-post 45minute intervention class) and the overall qualitative findings suggestive of positive impacts on wellbeing and mood. Therefore, there may be more short-term impacts of yoga and mindfulness interventions that were not necessarily sustained more long-term and thus were not captured in the post-intervention measures administered after ten weeks. This lack of sustainability was highlighted by adolescents within the qualitative data when they noted the confounding factors in their lives, such as the demographics of their local area and the levels of crime, which may have negatively affected their wellbeing. Similarly, the issue of sustainability and the limited length of the intervention was raised by professionals, who did not view ten weeks as sufficient to enable any level of long-lasting change. Subsequently, 45-minute yoga and mindfulness classes may have been beneficial when adolescents were actively participating and

possibly for some time after. However, this was not necessarily sufficient to combat the other factors they reported within their lives (see Chapter 10, Section 10.2.2. for further discussion of intervention dosage).

There was also convergence between the qualitative data and quantitative data measuring perceptions, which showed that adolescents perceived the interventions to be more helpful for managing stress and wellbeing and cited an increased number of benefits in comparison to the control group. This suggests that, when asked directly about the perceived benefits (either quantitatively or qualitatively), adolescents cited a range of wellbeing benefits they felt they had experienced after participation. However, it should be noted that there were differences in some of the benefits cited for each of the interventions; mindfulness was perceived to be superior for concentration, coping with stress and exams, whilst both mind-body interventions were perceived to support calmness and relaxation, sport, anger, connection, and sadness. Despite these subtle differences between yoga and mindfulness, these did not translate into demonstrable changes on any of the validated wellbeing measures. This suggests that the measures used may not have been sensitive enough to recognise any change or may not have been suitable or accessible with the current cohort of adolescents. This may raise methodological questions regarding the best measures to use with young adolescents to explore wellbeing changes. However, it also strongly points to the usefulness of mixed methods designs to understand the complexities in health intervention evaluations.

The value of these designs was also highlighted in an area of silence within the different methodologies; the quantitative data shed light on how the interventions may work differently for more vulnerable (high stress, low wellbeing) adolescents. These analyses showed reductions in positive self-compassion and increases in adolescents' ability to fall asleep more quickly for more vulnerable adolescents. However, there was

no available qualitative data to triangulate, as it was not possible to analyse the qualitative data by specific groups of young people. Therefore, the mixed methods design revealed additional insights that would not have been gleaned using only one methodology, which may help direct future research to better understand this complex pattern of findings.

Table 36. *Convergence Coding Matrix: Impact of Yoga and Mindfulness on Adolescents' Wellbeing.*

Quantitative		Convergence Assessment	Qualitative		
Section	Finding		Section	Finding	
6.2.1	There were no differences on adolescents' scores on the measures of wellbeing, stress, mindfulness, resilience, negative self-compassion, self-regulation, or sleep.	Dissonance	7.2.3	Adolescents described a number of benefits for regulating emotions, calming the mind, and increasing their positivity and confidence, suggesting positive impacts on their overall wellbeing. Pupils articulated tangible examples of using the skills they had learned in intervention classes to manage their stress and wellbeing.	
6.2.1	Adolescents in the intervention groups displayed higher rates of positive emotions and lower rates of negative emotions after each intervention class compared to the control group.	Partial Agreement			
6.3.2	Adolescents viewed the interventions as more beneficial for managing their stress and wellbeing in comparison to the control. Adolescents also perceived benefits to their ability to cope with stress (for those in the mindfulness group) and coping with feelings of sadness, relaxation, anger, sleep and spirituality (for both groups).	Agreement	8.2.4	Professionals also observed these wellbeing benefits, who described how pupils were calmer and better able to regulate their emotions and behaviours.	
6.2.1	Adolescents in the mindfulness intervention group demonstrated decreases in positive self-compassion in comparison to the control group.	Dissonance	7.2.3	Adolescents described increases in their self-esteem, self-confidence, positivity, and self-compassion and compassion for others.	
6.2.1	Vulnerable adolescents showed a different pattern of results in comparison to non-vulnerable adolescents including reductions in positive self-compassion for those in the intervention groups, and increases in their ability to fall asleep for those in the mindfulness group.	Silence		-	

9.2.2 What Impact do Yoga and Mindfulness have on Adolescents' Cognitive Skills?

Unlike the impact of yoga and mindfulness on adolescents' wellbeing, there was considerable convergence between the quantitative and qualitative cognition data, showing a high level of agreement (Table 37). Indeed, both sets of data indicated that yoga and mindfulness positively affected adolescents' cognitive skills.

The quantitative data showed significant increases on two measures of cognitive and executive functioning skills; the SLCT, designed to measure sustained attention, focus and concentration, visual scanning, and activation and inhibition of rapid responses; and the DSST, designed to measure attention, visuo-perceptual functioning, visuospatial scanning, working memory, and motor speed. Adolescents in the intervention groups showed significant improvements after the ten-week interventions on both of these measures. Therefore, even within the quantitative data there was agreement and triangulation between these two separate measures, increasing the reliability of cognition related benefits. However, it should be noted that the control group did not provide usable data for the cognition measures and therefore, the intervention groups could not be compared with the control group. Nevertheless, in a comparison between the control and intervention groups on perceived benefits, there were significant differences, with those in the intervention groups perceiving more concentration-related benefits than those participating in PSHE as usual.

These improvements in cognition were also articulated within the qualitative data, highlighting how adolescents themselves described the benefits to their focus and concentration within class. These increases in focus were thought to relate to having a clearer and more positive mind, feeling calmer and more relaxed, and improved strategies to help adolescents direct and re-direct their attention. Interestingly, participants in the mindfulness group articulated this as a sense of control over their mind and attention.

Therefore, in addition to improvements in cognition, the qualitative data further elucidated some of the mechanisms behind these improvements.

As a result of increases in focus and concentration, adolescents and professionals alike described potential improvements in academic engagement and/or attainment. This was also echoed in the quantitative data, where adolescents perceived benefits of yoga and mindfulness for helping with tests and exams. While this was not explicitly measured in the current study, future research should seek to assess adolescents' academic attainment to further explore any impact on pupils' attainment.

Taken together, the agreement between the data exploring the impact on adolescents' cognitive skills increases the reliability and validity of these findings, with implications for future research to further evidence any academic impact of the improvements in cognition across multiple cognitive constructs.

Table 37.

Convergence Coding Matrix: Impact of Yoga and Mindfulness on Adolescents' Cognitive Skills.

Quantitative		Convergence Assessment	Qualitative		
Section	**Finding**		**Section**	**Finding**	
6.2.2	After participation in the interventions, adolescents showed significant improvements on the Six Letter Cancellation Task and the Digit Symbol Substitution Task[1], indicative of improvements across the domains of working memory, motor speed, sustained attention, visual scanning, and activation and inhibition of rapid responses.	Agreement	7.2.3	Adolescents described how the interventions helped them to think with more clarity, which was linked to improvements in their focus and concentration. Adolescents described improvements in their ability to direct and re-direct their attention, which was seen to benefit their concentration in the classroom and, subsequently, their academic engagement and attainment.	
6.3.4	Adolescents viewed the interventions as more beneficial for their concentration and performance on tests/exams; there were significant increases in these factors for the mindfulness group and non-significant increases for those in the yoga group.	Agreement	8.2.4	These cognitive benefits were also observed by professionals, who described how adolescents were calmer, more focused, and consequently, were more engaged in lessons (with implications for academic engagement and attainment).	

Note. There was no control group to compare the intervention groups with.

9.2.3 *How do Adolescents and Professionals Perceive the Acceptability and Use of Yoga and Mindfulness in Schools?*

When considering the perceptions of the acceptability and use of yoga and mindfulness interventions, there were interesting silences within the data pertaining to their pre-intervention views of acceptability and use within the quantitative and qualitative data (Table 38). There were further disagreements within the qualitative data from each sample, reflecting different views from professionals and pupils.

More specifically, the qualitative data revealed that professionals had positive views of yoga and mindfulness in schools, stemming from substantial concerns for the increasing rates of mental health and wellbeing problems in adolescence. Limited provisions within schools exacerbated these concerns to support adolescent mental health, due to reductions in funding, resources, and capacity. Subsequently, professionals held positive views about the benefits that yoga and mindfulness could have in the school context, hoping for improvements in adolescents' self-regulation, strategies to manage stress, and improvements in their academic engagement and attainment.

In contrast to the positive perceptions described by professionals, adolescents expressed more neutral or negative pre-intervention perceptions of acceptability. Having limited knowledge of yoga and mindfulness, adolescents relied upon the media, friends and family, and personal assumptions of what these interventions entailed. These perceptions generally made adolescents question if the interventions would be boring, which was a primary concern for those assigned to practice mindfulness. For the yoga group, there were limited references to concerns about activities being boring, but heightened concerns about if the activities would be appropriate for them based upon images that they saw in the media. Therefore, there were some nuanced differences even within the pupils' qualitative data, based upon which intervention participants were engaging in.

Therefore, the silences and within-methodology differences in the pre-intervention perceptions showcase the value of mixed methods research, elucidating the different views of acceptability and use that came through in the accounts of adolescents and professionals within the qualitative data. Moreover, the disagreement within the perspectives of professionals and pupils shows the value of the involvement of multiple stakeholders within research.

As well as the silences, there was a great deal of agreement within the quantitative and qualitative data exploring acceptability. The quantitative data showed that adolescents in the intervention groups enjoyed the intervention classes significantly more than the control group. The qualitative data expanded upon this, highlighting the aspects of the interventions that adolescents enjoyed the most. These included the high level of interactivity in classes, which encompassed various activities that adolescents did not usually experience in the classroom. Additionally, adolescents also enjoyed and appreciated the invitational environment facilitated within the classroom. This enabled and empowered adolescents to have agency over their choices about which activities they wanted to participate in. As such, the qualitative data helped deepen understanding of the quantitative data, suggesting the main reasons for the higher enjoyment ratings.

Similarly, the quantitative data showed that adolescents had more positive perceptions of the intervention facilitators, in comparison to the control group who were taught by their usual schoolteacher. Enjoyment and teacher ratings were highly correlated, with teacher ratings explaining over a quarter of the variance in adolescents' ratings of enjoyment. The qualitative data expanded upon this, showing the qualities and traits that adolescents particularly valued, including intervention facilitators' non-reactivity, non-judgemental, and caring approach, which differentiated them from other adults in adolescents' lives. There was further agreement with the professionals' data,

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where intervention facilitators described the strategies that they used to build rapport and positive relationships with adolescents, including non-reactive styles, trying to get to know adolescents, and positive reinforcement techniques.

Taken together, the qualitative data provided additional context than what was seen in the quantitative data regarding pre-intervention perceptions. Additionally, the qualitative data furthered understanding of the quantitative findings, indicating why adolescents generally viewed the interventions as acceptable and how this interacted with the views of professionals.

Table 38.

Convergence Coding Matrix: Adolescents and Professionals Perceptions of Yoga and Mindfulness in Schools.

Quantitative		Convergence Assessment	Qualitative		
Section	**Finding**		**Section**	**Finding**	
	-	Silence	7.2.1	Adolescents described their expectations and assumptions before participating in yoga and mindfulness classes, many of which were neutral or negative.	
	-	Silence	8.2.1	Professionals described the drivers of implementation, highlighting their perceptions of the context of acceptability, namely concerns for adolescents' mental health and limited school-based resources.	
6.3.1	Adolescents in the intervention groups provided significantly higher ratings of enjoyment in comparison to the control group.	Agreement	7.2.2	Adolescents described the interactivity of classes, with different activities and components, and the agency over their choices as key mechanisms that increased their engagement and enjoyment.	
6.3.3	Adolescents in the intervention groups provided significantly higher ratings of their intervention facilitators, in comparison to the control group who was taught by their usual schoolteacher.	Agreement	7.2.2	Adolescents described the positive qualities that intervention facilitators displayed, focused on their non-judgemental, non-reactive, and caring approaches. Adolescents valued these qualities.	
	The quantitative data showed strong positive correlations between ratings of the teacher and enjoyment. Ratings of the teacher explained between 26-29% of the variation in enjoyment.		8.2.2	Intervention facilitators explicitly spoke of the implicit and explicit strategies they used to build rapport and positive relationships with adolescents. This was seen as integral within intervention delivery.	

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9.2.4 How are Yoga and Mindfulness Interventions Implemented and Delivered in Schools: What Works and What are the Challenges?

The qualitative process evaluation exploring implementation and delivery challenges and enablers was designed to contextualise the quantitative and qualitative impact findings. As such, there are multiple silences within the data, with the main findings originating from the professionals' qualitative data without corroborating quantitative data (Table 39).

The one exception to this was the agreement between the quantitative and qualitative data regarding the importance of positive relationships between adolescents and the intervention facilitators. Indeed, the intervention facilitators strongly articulated the importance of developing rapport and breaking down any barriers with adolescents early on to support the development of positive and trusting relationships within the classroom. Further to this, quantitative data showed strong correlations between adolescents' perceptions of the PSHE teachers, enjoyment, and how useful adolescents perceived the interventions to be for stress and wellbeing, explaining between a fifth and a third of the variance in teacher ratings. Thus, the inferential statistics supported the qualitative data, providing further evidence for the strong link between the perceptions of the intervention facilitators and their overall intervention experience.

The qualitative data alone continued to address this research question, furthering understanding of what works and the challenges within the implementation and delivery of mind-body interventions in the school setting. This highlighted the enabling factor of intervention facilitators developing positive and collaborative working relationships with other school staff to help manage the classroom dynamics. Similarly, professionals described a plethora of practical, logistical, and on-the-ground challenges with implementation and delivery. These covered challenges in terms of adolescent behaviour and classroom management, barriers around the inclusivity (or lack of) within the

curriculum content, and lastly spacing, layout, and set-up issues within the classroom; all of which acted as undermining the aims and objectives of yoga and mindfulness intervention classes.

Lastly, professionals reflected on the challenges of delivering ten-week interventions within the school curriculum, with limited follow-up. This was viewed as a considerable barrier to any long-term benefits arising from the interventions. Consequently, professionals theorised as to how the interventions could be sustained in the overall school context, providing learning for future schools, debating the appropriateness of universal versus targeted delivery options and any opportunities to embed the intervention in other parts of the school day (e.g., tutor time or form periods).

When considering the implementation and delivery challenges and enablers, the qualitative data was the main contributor. This shows the usefulness of conducting a qualitative process evaluation, alongside an impact evaluation, to add further context to the impact evaluation to better understand any reasons for intervention effectiveness (or lack of).

Table 39.

Convergence Coding Matrix: Implementation and Delivery: What Works and Challenges.

Quantitative		Convergence Assessment	Qualitative	
Section	**Finding**		**Section**	**Finding**
6.3.3 6.3.4	There were strong positive correlations between measures of adolescent acceptability; ratings of the PSHE teacher, enjoyment and usefulness for managing stress and wellbeing, showing the importance of building positive relationships. Ratings of the teacher explained between 18-29% of the variation in enjoyment and managing stress and wellbeing.	Partial Agreement	8.2.2	Professionals described the fundamental importance of building trusting relationships with adolescents, based on mutual respect and communication principles.
	-	Silence	8.2.2	Professionals described the importance of building positive collaborative relationships with school staff to help manage the classroom.
	-	Silence	8.2.3	Professionals raised practical and on-the-ground challenges in relation to intervention implementation; adolescent attitudes and misbehaviours, the inclusivity of the curriculum, and the appropriateness of the physical environment.
	-	Silence	8.2.4	Challenges around the sustainability of any benefits were questioned with no embedding or follow-up of the interventions within the school context.

9.3 Summary of Findings

In line with the rationale for conducting mixed methods research, one of the main advantages to this type of research is the elaboration, enhancement, and triangulation of findings, enabling a more complete and coherent understanding in relation to the research questions (Bryman, 2006; Farmer et al., 2006; O'Cathain et al., 2010; Tonkin-Crine et al., 2016). Integrating the quantitative and qualitative data through a convergence coding matrix allowed an overall evaluation of the convergence between the different data sets.

There was overall agreement (or partial agreement) between a large proportion of the generated data, including the positive impact on short-term mood measures, the perceived wellbeing benefits of the interventions, and the qualitative descriptions that described the range of wellbeing-related benefits that adolescents experienced (or were seen to experience by professionals). There was also substantial agreement on the positive impact on adolescents' cognitive skills, with no areas of dissonance between the datasets. Similarly, the quantitative and qualitative data sets were generally aligned in presenting adolescents and professionals' perceptions of the acceptability of the interventions, with the qualitative data generally expanding upon the reasons behind the quantitative findings.

In addition to showing areas of agreement, the matrices highlighted one main area of dissonance within the data sets. Dissonance should not be viewed negatively or as a "failure in the study" (Tonkin-Crine et al., 2015, p. 2) but should be considered as a constructive finding that has led to a richer or more nuanced understanding of the phenomena being researched (Miles & Huberman, 1994). The main area of dissonance pertained to the impact of yoga and mindfulness on adolescents' wellbeing. Indeed, the validated quantitative scales measuring wellbeing changes after participation in the interventions showed limited difference. However, the qualitative data described several

wellbeing benefits for adolescents. These included regulating emotions, calming the mind, and increasing adolescents' positivity and confidence, suggesting positive impacts on their overall wellbeing. Similarly, the quantitative data showed significant decreases on measures of positive self-compassion, which also disagreed with the qualitative data suggesting improvements in adolescents' self-esteem, self-confidence, positivity, and compassion. Thus, a complex and nuanced pattern of results was revealed when addressing the impact of yoga and mindfulness on adolescents' wellbeing that requires further exploration.

Lastly, there were several silences between the data sets. Silences are important and potentially expected, owing to the strengths and roles of the different methodologies to examine different aspects of the phenomena being studied (O'Cathain et al., 2010). There was one instance where the qualitative data was silent, with additional insights provided by the quantitative data in terms of sub-group analyses of wellbeing impacts. However, most of the silences came from the quantitative data, with the qualitative data offering additional insights. Indeed, the qualitative findings enabled exploration of adolescents and professionals' prior expectations and assumptions of the interventions. These accounts revealed different perspectives, with more positive views around acceptability described by professionals and more negative or apathetic views expressed by adolescents. Despite the silence between the quantitative and qualitative data on this dimension, there was also additional dissonance within the qualitative data between participant groups, which should be noted. There were further silences between the quantitative and qualitative data relating to implementation and delivery challenges and enablers. This may be expected considering the role of the qualitative process evaluation, which was designed to answer additional questions relating to implementation-level

factors that may have affected the effectiveness or otherwise of the yoga and mindfulness interventions.

In conclusion, the advantages of a mixed methods approach were realised within the current study, showing the additional insights gained from each methodology. Moreover, the findings showed a nuanced pattern of results, which may be expected when evaluating complex interventions within real-world conditions and is one of the reasons mixed methods research is recommended in these contexts (Craig et al., 2008; Creswell, 2007; Public Health England, 2018). Therefore, presenting these areas of agreement and dissonance within the data served to increase the validity and integrity of the findings and contribute to the completeness of the interpretations.

10. General Discussion

10.1 Overview of Chapter

The overarching aim of this thesis was to comprehensively explore the impact of school-based yoga and mindfulness interventions for disadvantaged adolescents in the UK; a previously understudied population. This was conducted alongside a process evaluation of implementation to deepen and expand the findings regarding the interventions' effectiveness (or otherwise), providing learning for other settings. A mixed methods design was utilised, bringing together the advantages of both quantitative and qualitative methods to better understand the impact of complex health interventions delivered within the school context. This final chapter will summarise the overarching findings in relation to previous literature and ongoing debates, specifically highlighting the original contribution to knowledge that the current research adds to the evidence base. Furthermore, the strengths and weaknesses of the current research are considered, owing to the methodology, sample, and integrity of the research findings. Subsequently, the implications for practice are considered in relation to the increasing rates of adolescent mental health problems exacerbated by the COVID-19 pandemic and wider implications for school-based research more generally.

10.2 Key Findings and Relevance to Existing Evidence

Children and adolescents from areas of lower SES and higher levels of deprivation are at increased risk of mental health and wellbeing issues (Reiss, 2013; Sadler et al., 2018). As a way of supporting mental health and wellbeing, yoga and mindfulness interventions have been shown to have a positive impacts (Carsley et al., 2018; Ferreira-Vorkapic et al., 2015; Kallapiran et al., 2015; Khalsa & Butzer, 2016; Klingbeil, Renshaw, et al., 2017; McKeering & Hwang, 2019; Miller et al., 2020; Sapthiang et al.,

2019; Serwacki & Cook-Cottone, 2012; Zenner et al., 2014). Nevertheless, the evidence base to date is comprised of mainly international literature, which has delivered mind-body interventions to targeted groups of children and adolescents. In contrast, this thesis has described the impact and process of implementation of universal yoga and mindfulness interventions in a mainstream secondary school in England, UK. In doing so, this study extends the growing evidence base of yoga and mindfulness interventions in schools to enhance adolescents' socio-emotional learning and their psychological, cognitive, and intra- and interpersonal skills. It contributes high-quality evidence, addressing many of the limitations of previous research, and demonstrates the feasibility of conducting a three-arm RCT in a school setting in the UK.

The findings highlight that yoga and mindfulness were acceptable to adolescents from areas of low SES in the UK; a previously neglected population. While some adolescents may have been sceptical initially, most enjoyed and benefited from practising yoga and mindfulness at school, citing perceived benefits across psychological, cognitive, interpersonal, and physical domains. These interventions were most acceptable to adolescents when they were delivered by a facilitator with positive and non-reactive qualities, who facilitated an invitational environment, with interactive class-based activities. The importance of the intervention facilitator was further highlighted by professionals who concurred that this was an important construct within intervention sessions, highlighting the importance of positive teacher-pupil relationships and collaborative relationships with school staff to support the delivery of interventions. The professionals further suggested some areas of challenge within the delivery of mind-body interventions within the school context, including the appropriateness of the intervention content for the audience, the behavioural management strategies adopted within class, and logistical and practical barriers in terms of spacing and resourcing. Moreover, there

was a consensus from pupils and professionals alike that ten weeks was insufficient to achieve meaningful change. Consistent with this viewpoint, there were minimal differences on validated measures of wellbeing after the full intervention period, however individual intervention sessions positively impacted adolescents' mood. Therefore, for interventions to be most effective, schools may need to further embed mind-body interventions into the school day, increasing the dosage to sustain any benefits over a longer-term.

Taking the findings from the current thesis as a whole, the key findings are relevant to a number of ongoing debates within the field of school-based mental health and wellbeing support. More specifically, the findings inform discussions regarding the appropriateness of universal vs. targeted mental health and wellbeing support, the optimal dosage of mental health and wellbeing interventions, and the optimal delivery method by internal vs. external facilitators. These debates and how the current findings contribute to them are discussed below.

10.2.1 Acceptability of Universally Delivered Mind-Body Interventions

Given the increasing rates of adolescent mental health and wellbeing issues (NHS Digital, 2020; Sadler et al., 2018), educational institutions are increasingly turning to interventions to promote positive mental health (Bonell et al., 2014) and fulfil the aims of health education within the PSHE curriculum (DfE, 2019). The current findings show that adolescents from this novel population (i.e., adolescents from an area of low SES in the UK) enjoyed mind-body interventions, saw their value for supporting their wellbeing and stress-management, and perceived benefits from participation. These views were also echoed by professionals who saw, first-hand, the benefits for their pupils. Consequently, the current research strongly supports the acceptability of school-based yoga and mindfulness interventions for adolescents in deprived areas of the UK. This is consistent

with previous research. However, the acceptability of these interventions was demonstrated with a much more diverse sample.

This is a particularly important and noteworthy finding given that the interventions were delivered in a universal way to all Year 8 pupils in the intervention groups. The universal delivery method is in keeping with the UK policy landscape, which has advocated for whole school approaches to promote the mental health and wellbeing of children and adolescents (NHS England and DoH et al., 2015). Nevertheless, the debate regarding the appropriateness and effectiveness of universal versus targeted mental health support is ongoing (Rapee et al., 2006). Indeed, previous reviews have concluded that targeted mental health and wellbeing interventions are more effective than universal interventions in terms of increasing mental health and wellbeing outcomes (Horowitz et al., 2007; Sanchez et al., 2018; Werner-Seidler et al., 2017). Nevertheless, others have advocated for universally delivered interventions, which have been shown to be effective to varying degrees (Clarke et al., 2021; Durlak et al., 2011; Mackenzie & Williams, 2018; O'Connor et al., 2018; Pandey et al., 2018; Salerno, 2016; Wells et al., 2003).

However, the methodological challenges for research exploring the effects of interventions delivered at the universal level should be noted due to potential floor and/or ceiling effects (Challen et al., 2014; Mackenzie & Williams, 2018). More specifically, it has been suggested that demonstrating improvement at the universal level is much more challenging in comparison to interventions that target high-risk groups, who generally display more negative baseline measures with more scope for improvement over the course of the intervention (Stallard et al., 2013). Similarly, studies that explore more preventative-based interventions, as opposed to specific support for targeted groups, generally demonstrate smaller effects (Challen et al., 2014). However, the delivery of the interventions with a much more diverse group of participants does increase the ecological

validity and generalisability of the findings (Britton et al., 2014). Therefore, moving the universal population mean "even a small amount" (Kuyken et al., 2013, p. 5) at such a key developmental stage, such as adolescence, could potentially have increased value in comparison to targeting those at risk or who have already developed mental health problems (Huppert, 2009). This supposition is in line with the prevention paradox principle, which states that interventions may be more effective in reducing disease burden (in this case mental health issues) when delivered to a large number of low-risk individuals, in comparison to a smaller number of high-risk individuals (Rose, 1992).

Given the methodological challenges associated with universal interventions, the current study may be considered consistent with previous evidence. Even though the quantitative findings demonstrated limited changes after participation in mind-body interventions, this may be due to floor and/or ceiling effects. Nevertheless, pupils and professionals were able to articulate perceived benefits of the interventions, suggesting a positive impact on the mental health and wellbeing of adolescents. Thus, there may be benefits beyond what is measured quantitatively that point to the effectiveness of universally delivered mind-body interventions with adolescents in the UK. Saeki et al. (2011) shared this viewpoint, suggesting that quantitative measures may not be sufficient to capture change on aspects of social, emotional, and behavioural functioning. Instead, qualitative methods allow deeper and more nuanced understanding of participants' perceptions, meaning, and experiences, which may explore any perceived benefits more fully (Hammarberg et al., 2016) and provide unique contributions to outcomes research (Curry et al., 2009). Therefore, the mixed methods approach utilised both approaches, with the aim of providing a more coherent account of any benefits (Bryman, 2006).

Whether delivered as universal or targeted approach, a single universal intervention is insufficient to address all levels of mental health and wellbeing issues.

Pragmatically, it is likely that schools may provide both universal and more targeted mental health and wellbeing support for pupils, forming a spectrum of school-based mental health support. In doing so, universally delivered yoga and mindfulness interventions within the PSHE curriculum should be a part of a tiered approach to supporting mental health and wellbeing. This approach is consistent with overarching approaches to supporting mental health at school (Barry & Jenkins, 2007).

Nevertheless, recently there have been some concerns raised about such wide-scale promotion of mind-body interventions, which should be considered when incorporating these practices into the curriculum for all. As outlined in Chapter 2 (Section 2.6), there are potential adverse effects of mind-body interventions. However, research has generally noted that a comprehensive understanding of adverse effects is limited, particularly for individuals without pre-existing conditions (Lustyk et al., 2009). Whilst not focused on children and adolescents specifically, research has found that mindfulness meditation could increase awareness of difficult feelings and exacerbate psychological problems (Dobkin et al., 2012; Kerr et al., 2011; Lomas et al., 2015). Indeed, increasing awareness of the present may amplify awareness of negative circumstances and/or predispositions to mental health and wellbeing issues (Farias & Wikholm, 2016). In addition to psychological adverse effects, yoga has also been shown to contribute to physical injuries, soreness, and pain (Cramer et al., 2019; Matsushita & Oka, 2015; Telles et al., 2021). However, there is currently not a censuses as to who mind-body interventions may be contraindicated for (Dobkin et al., 2012; Van Gordon et al., 2017). In most cases, mind-body interventions are practiced with very few adverse effects if implemented as recommended under proper supervision (Kaley-Isley et al., 2010; Taylor et al., 2020). Whilst no adverse effects were found in the current study, the potential for adverse effects should be taken into consideration when implementing interventions such

as these with a large number of children and adolescents. Furthermore, future research should continue to report any adverse effects or challenges to shed light on the circumstances where mind-body interventions may not be appropriate or what may put individuals at greater risk of adverse events.

10.2.2 Intervention Dosage

In addition to demonstrating the acceptability of universally delivered mind-body interventions for adolescents in mainstream UK secondary school, the current research raises questions in keeping with the ongoing debate regarding appropriate intervention dosage. As summarised in Chapter 9 (Section 9.2.1), there were considerable discrepancies between the quantitative and qualitative data regarding the impact on adolescents' mental health and wellbeing. More specifically, the qualitative data suggested a positive impact on adolescents' wellbeing, but the validated measures within the quantitative data showed minimal differences after intervention participation, in comparison to a control group. Nevertheless, there were significant improvements in adolescents' short-term mood after individual intervention sessions. Therefore, it could be concluded that the interventions had a positive impact, but the impact was not sustained or not reflected in more global measures of wellbeing at the end of the ten weeks. This raises questions regarding the optimal dose of the interventions, including the intensity and frequency of sessions, which may affect the impact of the intervention.

Concerns about the dosage of yoga and mindfulness interventions have been widely discussed within the literature. Sherman (2012) highlighted that "an appropriate dose must be established to optimize the potential value" (p. 2) of yoga and mindfulness interventions for participants; both in terms of the frequency of sessions (number of sessions per week and number of minutes per session) and length of programme (total number of weeks). However, given the relative infancy of the field, an appropriate dosage,

especially for children and adolescents, has not yet been established. Previous research has utilised yoga and mindfulness intervention programmes of varying lengths. Interestingly, however, there appear to be significant differences between the length of yoga and mindfulness interventions. Across the breadth of the childhood and adolescent yoga literature, intervention length has ranged from a single session (e.g., Felver et al., 2015) to sessions across a whole school year (e.g., Nilsoge et al., 2016; Wang & Hagins, 2015), with varying results. The frequency or intensity of yoga classes has also varied dramatically within past yoga-based studies, ranging from a couple of times per week (2-4 times per week; e.g., Daly et al., 2015; Frank et al., 2014; Khalsa et al., 2012; Noggle et al., 2012) to everyday of the school week (5+ times per week; e.g., Chaya et al., 2012; Manjunath & Telles, 2001, 2004; Verma et al., 2014). These estimates are in line with Khalsa and Butzer's (2016) review of school-based yoga interventions, which highlighted that the length of yoga interventions ranged from 1-52 weeks, whilst the number of sessions within programmes ranged from 5-100 sessions.

In contrast, the length and frequency of mindfulness interventions was more homogenous and generally lower than yoga-based interventions. The average length and frequency ranged from 6-12 once-weekly sessions (Huppert & Johnson, 2010; Kuyken et al., 2013; Kuyken et al., 2017; Lau & Hue, 2011; Metz et al., 2013; Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al., 2015; Semple et al., 2010; Sibinga et al., 2011, 2013). This estimate was similar to the reported range of 4-12 weeks highlighted by McKeering and Hwang (2019) and was also within the range reported by Sapthiang, Van Gordon, and Shonin (2019; 3-20 weeks).

Given the large heterogeneity between intervention length and frequency, the dosage may be a significant factor contributing to the effectiveness (or otherwise) of yoga and mindfulness interventions. Indeed, Miller et al. (2020) noted that significant

intervention effects had been found in studies examining programmes with 12 sessions. Given the frequency (approximately 45 mins, once per week) and length (ten weeks) of the interventions in the current study, it may be that the interventions did not provide adolescents with sufficient exposure to evidence measurable changes. Nevertheless, it is noteworthy that Haden et al. (2014) evaluated a yoga intervention that was delivered three times a week, for twelve weeks (totalling 36 sessions), yet the researchers still had concerns about the dose. For optimal exposure, Streeter et al. (2010) suggested that practice should be daily for interventions to be most effective and benefits to be most pronounced (e.g., short 5-10 minute breathing exercise). However, there are challenges when considering daily practice within a school context, which would require further embedding of mind-body interventions in the wider school day with increased buy-in from senior management (Dariotis et al., 2017; Hudson et al., 2020; Wilde et al., 2019).

One way that future programmes may increase the dosage without impacting upon school time, is through home practice. Many yoga and mindfulness interventions specify a programme of home practice to complement the in-session content. Therefore, if participants engaged with this aspect of the intervention, as well as attending classes, the dosage would be substantially increased. For instance, in Huppert and Johnson's (2010) research, it was observed that there were only significant wellbeing changes for those pupils who engaged with mindfulness beyond the classroom. However, other researchers have not found the frequency of engagement in home practice to account for substantial variance in outcome measures (Johnson et al., 2016). At present, this debate within the literature remains occupied with conflicting findings. Therefore, until a consensus has been reached regarding the usefulness of, engagement with, and adherence to home practice, researchers must remain cognisant of the realities of the homework demands placed on adolescents from the various subjects within their school timetable (Johnson et

al., 2016). Whilst engagement in home practice for mind-body interventions is considerably different to homework from other subjects, it still requires time, space, effort, and motivation from adolescents to engage in. For mind-body practices in particular, adolescents require quiet spaces to practice for optimal engagement. However, disadvantaged pupils are less likely to have an appropriate space at home due to overcrowding and noise in the home (Evans, 2006; He & Yin, 2016), which result in inconducive environments for practice. Therefore, in taking home practice into account, it may be that limited engagement with this aspect of interventions decreases the hypothesised dosage. However, this needs to be closely weighed up against the demographics of the sample.

Taking the debate surrounding the dosage into consideration, it could be concluded that the intensity and frequency of the interventions (and home practice) in the current study was not sufficient to produce demonstrable and significant quantitative changes in adolescents' wellbeing. However, as articulated by Mendelson et al. (2014), given the limited empirical data, it is necessary to identify a dosage that is "high enough to produce skills acquisition but low enough to maintain student interest and avoid significantly interfering with other programming" (p. 281). Finding this balance may be challenging but necessary to elucidate the optimal time investment needed for mind-body interventions. Furthermore, if and how this time investment is possible or practical within the school context needs to be clarified. Thus, it is likely that this may raise questions about the value of integration into the school day through a more holistic, whole school approach.

Moreover, moving away from thinking about dosage of a particular intervention, it may be that whole school approaches are more conducive to supporting the mental health and wellbeing of children and adolescents. Whole school approaches are concerned

with changing the school environment and overall ethos to provide a more supportive community school (Barry & Jenkins, 2007). In doing so, this moves beyond the four walls of the classroom to consider the broader, holistic, organisational structures and environment of the school, involving all stakeholders. Where whole school approaches to mental health and wellbeing have been employed, these have been associated with positive impacts on mental health, wellbeing, and attainment (Public Health England, 2015). These conclusions were in line with research that has suggested that whole school approaches were optimal for mental health promotion to be effective within these settings and facilitate positive change for children and adolescents (Weare & Murray, 2004). Indeed, multi-dimensional approaches to mental health and wellbeing, involving multiple approaches, strategies and stakeholders, were found to be superior to unidimensional support (Catalano et al., 2004; O'Reilly et al., 2018; Rowling, 2009; Wells et al., 2003). This suggests the value of co-ordinated whole school approaches for supporting adolescents' mental health and wellbeing, in a way that cannot be achieved through a singular 'wellbeing' slot within the PSHE curriculum, regardless of the dosage.

10.2.3 Delivery by Internal vs. External Facilitators

The current research also contributes to the debate surrounding the most appropriate way to deliver mental health and wellbeing interventions within schools, with a focus on the position of the intervention facilitator. In terms of the distribution of interventions delivered by internal vs. external facilitators, it has been noted that universally-delivered interventions were more likely to be delivered by internal facilitators, whilst targeted interventions were more likely to be delivered by external facilitators (Arora et al., 2019; Werner-Seidler et al., 2017; Williams et al., 2020). However, most research concurs that the majority of school-based mental health intervention evaluations have adopted an external facilitator model (Caldwell et al., 2019;

Calear & Christensen, 2010; Maynard et al., 2017), as in the current research. Despite this, there are advantages and disadvantages to both delivery methods, with some research observing differences between internally vs. externally delivered interventions as a key factor in intervention effectiveness and other research revealing no impact of the facilitator position on outcomes (e.g., Farahmand et al., 2011; Maynard et al., 2017; Rohrbach et al., 2010; Rohrbach et al., 2005).

Britton et al. (2014) raised the possibility that delivery by an external facilitator may act as a barrier to intervention delivery, as adolescents may not be as receptive to a new, external, professional coming into the classroom. This concern was initially borne out in the accounts of adolescents and professionals within the current research. However, once adolescents had a chance to get to know the intervention facilitators, they reported high likeability scores, surpassing their positive feelings towards their internal schoolteachers. Therefore, the current research has indicated the acceptability of external professionals as intervention facilitators, particularly for delivery of universal interventions. Moreover, the qualitative data and a subset of the quantitative data suggest that the interventions positively impacted wellbeing through this delivery method, suggesting that this delivery method was also effective.

The current findings are consistent with a recent meta-analysis of school-based mindfulness interventions, which discussed the disparities observed when different facilitators delivered intervention classes (Carsley et al., 2018). It was concluded that improvements in mindfulness outcome measures were significant when interventions were delivered by an external facilitator (Carsley et al., 2018) instead of an internal facilitator. Similarly, Werner-Seidler et al. (2017) and Calear and Christensen (2010) concluded that externally-delivered school-based mental health interventions had larger effects on outcome measures in comparison to internally delivered interventions. Carsley

et al. (2018) suggested this pattern of findings could be due to the external facilitators having increased professional and personal experience with, and knowledge of, mental health and wellbeing skills involved in the interventions, in comparison to school staff who may have only been trained over a brief period (Zenner et al., 2014). Indeed, external facilitators' level of training and expertise should not be overlooked. In the current study, intervention facilitators called upon their strong socio-emotional competencies and training to continue to facilitate a calm classroom and this non-reactivity was highly valued by adolescents. This is in line with past research and theory that has implicated the socio-emotional skills of the teacher in the outcomes of pupils (CASEL, 2015; Grant, 2017; Greenberg et al., 2005; Jennings & Greenberg, 2009).

However, these competencies may be difficult for intervention facilitators to cultivate and practice, especially in challenging classroom situations. Grant (2017) noted that employing these skills was reliant on strong training and personal mindful practices from the facilitators, high attunement to themselves and their emotions, and awareness of their triggers. Considering this, some researchers have questioned the appropriateness of internal facilitators delivering mind-body interventions. Indeed, it has been noted that teaching is a highly stressful occupation (Education Support, 2020; Johnson et al., 2005; National Education Union, 2018), which may hinder teachers' socio-emotional competencies and self-regulation. Moreover, teaching in highly deprived urban neighbourhoods may further contribute to teacher stress, adding an extra dimension to the ability of staff to effectively deliver school-based mental health interventions (Farahmand et al., 2011). As such, internal schoolteachers may not be the most effective facilitators for mind-body interventions, which require modelling strong socio-emotional skills for the most effective and calm classroom environments (Jennings & Greenberg, 2009).

Despite this supposition, Carsley et al. (2018) observed that there were only significant improvements on adolescents' mental health and wellbeing outcomes measures when interventions were delivered by an internal facilitator. Similarly, Payton et al.'s (2008) meta-analysis also observed stronger effects for internally-facilitated, in comparison to externally-facilitated, wellbeing interventions. It has been suggested that teachers within the school were a consistent presence in the lives of pupils and would have had more time to establish trust within the teacher-pupil relationship, resulting in more effective intervention sessions (Carsley et al., 2018; Garcia et al., 2010). Indeed, the PSCMM supports this hypothesis, suggesting the importance of positive teacher-pupil relationships on the classroom environment and pupil outcomes more generally (Jennings & Greenberg, 2009). Carsley et al. (2018) also noted that internal teachers were more likely to continue to integrate elements of the intervention after the completion of the specific programme; such as embedding and practicing of skills, which may therefore have sustained positive effects on mental health on a longer-term basis (Britton et al., 2014). This was supported by Mendelson et al. (2014), who noted that school staff could meaningfully integrate mind-body skills and exercises across the curriculum and across different year groups to increase opportunities for practice (and therefore, increase the intervention dosage also). Consequently, there may be considerable advantages to training internal school staff in mind-body interventions.

When considering the debate between internal vs. external facilitators as optimal for intervention delivery, it may be that a combination of both approaches is needed to facilitate and sustain positive changes. Indeed, Chapter 8 (Section 8.2.4) highlighted concerns over the sustainability of intervention effects, with internal school staff expressing a desire to be trained in mind-body practices to use with their pupils in addition to and after the structured intervention session. This willingness to be trained in wellbeing

practices was consistent with previous research (Dariotis, Mirabal-Beltran, et al., 2016; Mendelson et al., 2014) and suggests an appetite to, at least partially, become the interventionist (Rashedi, 2018). Therefore, to optimise the effectiveness of interventions, it may be that external facilitators are brought in to use their knowledge, expertise, and training to deliver interventions to pupils initially, and this is complemented by teacher-embedded practices that help to incorporate mind-body practices more sustainably (recommended by professionals in Chapter 8, Section 8.2.4). However, there are funding and resource-related challenges to training internal teachers in mental health provision (DfE et al., 2017; Patalay et al., 2016), which reduce both the likelihood and scale of implementation of wellbeing provision. As such, Mendelson et al. (2014) concluded that it may not be feasible to add additional training into school staffs' already hectic schedules, unless this was integrated into professional development days (Dariotis, Mirabal-Beltran, et al., 2016). However, sustainability of intervention effects based on this model of training internal teachers may be more cost-efficient than reliance on external facilitators long-term, which would put a heavy financial burden on the school (Williams et al., 2020).

10.3 Strengths and Limitations

10.3.1 Methodology

10.3.1.1 Design. A main strength of the current research was the mixed methods design, which followed recommendations for evaluating complex health interventions (Craig et al., 2008; Public Health England, 2018). In adopting this approach, a more coherent picture was achieved, bringing together the strengths of both methodologies, to add richness, depth, and context in the exploration of the impact of yoga and mindfulness interventions for adolescents. Moreover, the most common and most detailed approach to integration was adopted (O'Cathain et al., 2010; Tariq & Woodman, 2013), increasing

the transparency of the findings. In adopting this approach, a varied and complex pattern of findings was revealed, triangulating findings, so that the research questions could be addressed more comprehensively.

Despite the strengths of the design, the research was conducted in a single school in the UK. This approach may lacks generalisability and future research should seek to expand the number of schools to increase the generalisability of the findings (in a way similar to the large-scale mindfulness evaluation currently being conducted; Kuyken et al., 2017; Montero-Marin et al., 2021). Nevertheless, the current research presented the overall demographics of the local area (Chapter 3, Section 3.2), which are not unique to the study site. As such, the findings have application to other urban schools in the UK located in areas with similar demographics. Despite this, any benefits arising from the interventions within one school should not be overstated and readers should remain cognisant to this.

10.3.1.2 Quantitative Methods. Within the mixed methods approach, the cluster RCT design employed is a strength of the research. Many of the previous meta and systematic analyses in the mind-body intervention field concluded that existing research lacked methodological rigour, with few RCTs exploring the effectiveness of interventions (Black et al., 2009; Serwacki & Cook-Cottone, 2012; Zenner et al., 2014). Thus, the use of a feasibility RCT with the use of a control group is a strength of the design within the current study, allowing more robust conclusions to be drawn. Furthermore, the use of this design in a novel population, UK adolescents from an area of high deprivation, points to the feasibility of a large-scale RCT with classically 'hard-to-reach' groups.

There were also strengths in terms of the explicit reporting of non-significant quantitative results (Chapter 6, Section 6.2.1), showing a strength in the integrity of the current research. At present, a consensus has not been reached within the field as to the

potential influence of publication bias when considering the impact of yoga and mindfulness interventions. Indeed, some meta-analyses have concluded that there is a low likelihood of publication bias within the field, whilst others conclude the opposite (Birdee et al., 2009; Breedvelt et al., 2019; Carsley et al., 2018; Dunning et al., 2019; Durlak et al., 2011; Klingbeil, Renshaw, et al., 2017; Maynard et al., 2017; Zoogman et al., 2015). However, the potential impact of this in terms of distorting the field and the ethical implications are considerable. In line with researchers' ethical duty, the reporting of non-significant findings in the current study has not contributed to any potential bias in reporting only statistically significant or positive findings.

Despite the strengths within the quantitative cluster RCT methods, there may also be limitations associated with a cross contamination. This is defined as the receipt of active intervention amongst participants in the control group (Keogh-Brown et al., 2007), which is thought to be more prevalent in complex health interventions (Craig et al., 2008), such as mind-body interventions within the current study. Intervention components are inherently transportable and hard to contain to the intervention groups only within a single setting, and therefore the receipt of intervention components for those in the control group is possible (Magill et al., 2019). Factors driving contamination include communication between staff in the active and control groups and communication between participants; both of which are noted as more likely in school settings (Keogh-Brown et al., 2007; Magill et al., 2019). Subsequently, cross-contamination dilutes the effects of the intervention, which may lead to a Type II error (Torgerson, 2001). Future research should seek to employ various strategies to minimise the risk of cross contamination, such as randomising at a higher level (e.g., school-level rather than class-level) and using larger sample sizes (Keogh-Brown et al., 2007; Magill et al., 2019; Torgerson, 2001; Wolfenden et al., 2021).

The appropriateness of the outcome measures employed may be criticised. The availability of appropriate wellbeing measures for the pre-adolescent age group (12-13 years old) is limited. Consequently, some measures that were employed were not explicitly validated with the current age group (e.g., PSS, WEMWBS, BRS). However, based on the precedent set by past research, they were employed within the current study. Other scales utilised in the current research had been validated with the current age group but did not have a particularly strong evidence base behind them, which may also have affected the findings (e.g., SCS-C). It is possible that these factors may have undermined the use of the measures with the current sample and may have contributed to some of the dissonance in the quantitative and qualitative wellbeing data, raising questions regarding the most appropriate ways to measure wellbeing with early adolescents. Alternatively, it may be that the quantitative measures were not sufficiently sensitive to measure changes across an intervention, particularly in a cohort of the size in the current study. It has been reported that large sample sizes of over 1000 are needed to detect small significant differences on the WEMWBS (Stewart-Brown et al., 2008). Therefore, future research should consider using additional outcomes data, possibly collecting more objective stress and wellbeing data such as cortisol levels, or triangulating self-report wellbeing responses from adolescents with additional parental or teacher reports.

A further limiting factor within the quantitative methods was the short follow-up period. Adolescents completed the post-intervention measures a week after the end of the interventions, which allowed exploration of the immediate effects. However, it is possible that some benefits may have taken longer to be fully realised. As such, future studies may benefit from follow-ups, to explore any long-lasting benefits or the emergence of any difficulties within practice.

Lastly, there remains an unresolved debate in the literature about how to effectively and accurately conceptualise, define, and measure wellbeing (Cooke et al., 2016; Jayawickreme et al., 2012; Lent, 2004). Furthermore, wellbeing is likely affected by a myriad of other factors unrelated to the intervention, particularly for disadvantaged populations who experience additional stressors at home (Conger & Donnellan, 2007; Reiss et al., 2019). Therefore, it may be naïve to assume wellbeing can be markedly improved for this population with an intervention limited to the school context.

10.3.1.3 Qualitative Methods. The qualitative methods were a strength in expanding and deepening knowledge through the mixed methods approach, shedding light on additional aspects of adolescents' experiences and intervention implementation. However, the interview recruitment strategy for adolescents could be considered a limitation of the current study. Whilst the sample was large ($n = 45$), participants were recruited through purposeful selection of pupils by school staff, with the aim of including those who had both heterogeneous experiences of the interventions. However, it is possible that school staff may have recruited adolescents who they thought would be more willing to engage in discussions, based on their personalities, or based on having more positive experiences of the interventions. There may also have been further confounding variables including social desirability biases, where pupils presented more positive viewpoints of the interventions. Whilst no members of the intervention or school staff were present for the interviews, and the interviewer stressed that there were no right or wrong answers, this bias may have impacted the responses. However, this seems unlikely given the honesty of participants when discussing their more negative expectations and/or experiences of the interventions.

Additionally, like the quantitative data, the timing of the interviews only enabled the exploration of immediate intervention effects. Whilst this ensured recall of the

intervention content, it did not enable exploration of any long-term impact of the interventions. Subsequently, future research may wish to collect qualitative data after a longer post-intervention time period, potentially longitudinally, in order to better understand the sustainability of yoga and mindfulness related benefits.

10.3.2 Sample

One of the considerable strengths of this research was the diversity of the participants within the adolescent sample. Unlike the majority of previous research, the sample in the current study was made up of predominantly adolescents from BAME backgrounds from a low SES area. Thus, the current research accessed groups generally considered as hard-to-reach or seldom-heard populations. Hard-to-reach groups are defined as those that are inaccessible or unseen within traditional and conventional research methods (Health and Safety Executive, 2004). Whilst there is no specific list of groups considered as hard-to-reach, these vary between different research contexts. Some have argued that children and adolescents generally are considered a hard-to-reach population, whilst others have also suggested that individuals from low SES (Bonevski et al., 2014) and BAME backgrounds classify as hard-to-reach groups (Flanagan & Hancock, 2010) as they are under-represented in service-use and research. Thus, the sample can be considered as consisting of a particularly vulnerable and hard-to-reach population. Consequently, given the demographic characteristics of the sample, the current research replicated the findings of other mind-body intervention studies with a more diverse sample of adolescents.

10.3.3 Universal Implementation

A further strength of the current study was the universal delivery of yoga and mindfulness interventions for adolescents. Previous research has shown that yoga and

mindfulness are more likely to be practiced by young, white, educated, females (Birdee et al., 2008; Olano et al., 2015). Consequently, age, gender, ethnicity, and SES may impact perceptions of mind-body practices and may play a role in individuals' decision to participate in these practices or not. Thus, more vulnerable populations, as in the demographics of the current sample, may be less likely to engage in mind-body interventions, and therefore less likely to access the physical and mental health benefits that they offer. Recent literature has attempted to explore the barriers to mind-body practices for populations who are less likely to engage. For both yoga and mindfulness, these barriers were focused on perceptions of religious connotations of mind-body interventions (Cagas et al., 2020; Deitz & Rajan, 2017; Palitsky & Kaplan, 2019), negative perceptions of yoga and mindfulness (Cagas et al., 2020; Kinser & Masho, 2015; Spadola et al., 2019; Tunney et al., 2017), lack of ability, skills, or self-efficacy (Gryffin et al., 2014; Kabat-Zinn, 1994; Spadola et al., 2017), limited time (Atkinson & Permuth-Levine, 2009; Burke, 2010; Carmody & Baer, 2009; Spadola et al., 2017), and the cost of participation (Atkinson & Permuth-Levine, 2009; Cagas et al., 2020; Spadola et al., 2019).

To overcome some of these barriers, Spadola et al. (2019) recommended that inclusive ways of delivering mind-body interventions should be free, with clear application to adolescents in terms of communicating the psychological, physical, and social benefits, and dispelling any myths. Spadola et al. (2019) also discussed the utility of school-based interventions to eliminate cost-related barriers and encourage widespread participation. Therefore, the current research study removed some of these practical barriers and engaged individuals who may have been less likely to seek out mind-body interventions. Indeed, regardless of gender, mental health needs, or motivation, all adolescents within the class took part in yoga and mindfulness interventions as a part of

their school curriculum. Subsequently, the universal approach enabled exploration of these interventions in a real-world setting, with increased ecological validity and application for mainstream schools.

10.4 Implications for Practice and Future Research

This thesis has implications that span two main areas. Firstly, the implications for school-based wellbeing interventions are considered, focusing on the timely need for additional adolescent mental health support in the wake of the COVID-19 pandemic. Secondly, the implications for future school-based research are considered, drawing upon the practical and ethical challenges of researching in these settings.

10.4.1 Considerations for School-Based Wellbeing Interventions

The current findings show that mind-body interventions are a positive first step in supporting the wellbeing of disadvantaged adolescents by equipping them with the tools to cope with the challenges in their everyday lives. Supporting adolescents to develop these socio-emotional skills has become more important than ever during and in the aftermath of the COVID-19 pandemic[63]. Recent research has revealed that COVID-19 has exacerbated adolescent mental health and wellbeing problems. More specifically, the rates of mental health disorders increased from approximately 11% in 2017 to 16% in July 2020 in the height of the pandemic (NHS Digital, 2020). When considering overall wellbeing, it was concerning that 43% of children and adolescents stated that lockdown had made their lives worse (NHS Digital, 2020). These increases in mental health and wellbeing problems do not appear to be only short-term. Loades et al. (2020) conducted a rapid review to examine the mental health impacts of social isolation (e.g., lockdown,

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[63] Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes (WHO, 2020).

social distancing, school closures etc.). The researchers concluded that children and adolescents were likely to experience increased rates of mental health and wellbeing issues for up to a decade after isolation (Loades et al., 2020). Thus, it is plausible that this group of children and adolescents may still feel the effects of COVID-19 in 2030. This led Hafstad and Augusti (2021) to question whether the current cohort of adolescents may be a "lost generation" (p. 6) due to COVID-19.

Consequently, there are timely implications for universal wellbeing interventions, such as school-based yoga and mindfulness, which have the potential to support positive mental health and wellbeing for adolescents. Given the current context, the development of positive emotional competencies through universal interventions may help to mitigate the impact of COVID-19, equipping adolescents with the skills better to manage their emotions, thoughts, and feelings. Adopting these interventions at a universal level was recommended by Hertz and Barrios (2021), who urged schools to expand their universal social and emotional learning opportunities in the aftermath of COVID-19, alongside more targeted support for those that need it.

In addressing the educational impact of COVID-19, in June 2020 the Government pledged £1 billion to support children and adolescents to catch up on missed learning time (DfE, 2020). However, there was no parity for the mental health impact of COVID-19 until nearly a year later. In March 2021, the Department of Health and Social Care (DoHSC) announced £79 million for mental health services for children and young people to be supported by mental health support teams at school (DoHSC, 2021; NHS England, 2021). Furthermore, in May 2021, the DfE committed £17 million to improve school-based mental health and wellbeing services (DfE, 2021). This included funding to train a member of staff as the senior mental health lead and a £7m Wellbeing for Education Recovery Programme. School leaders have "cautiously welcomed" these additional

funding streams (Santry, 2021, para 1). Nevertheless, these pledges for mental health related funding pale in comparison to the £1 billion funding for academic and attainment related support. Thus, until mental health support for children and adolescents is appropriately funded and resourced, schools will continue to face financial barriers in the provision of interventions such as yoga and mindfulness.

In addition to the impact of COVID-19 on adolescent mental health, COVID-19 appears to have also aggravated stressors for teachers. Even before the pandemic, teaching was considered a highly stressful occupation (Education Support, 2020; Johnson et al., 2005; National Education Union, 2018). However, over the course of the COVID-19 pandemic, up to 84% of teachers described themselves as stressed, with 44% describing symptoms characterising anxiety and 32% describing symptoms of depression (Education Support, 2020). Therefore, there may also be benefits to supporting staff to engage in mind-body interventions. Previous research exploring the impact of mind-body interventions for educators has suggested positive effects for teachers' stress, self-regulation, wellbeing, conflict-management skills, and risk of burnout (Dyer et al., 2020; Emerson et al., 2017; Hwang et al., 2017; Lomas et al., 2017; Luken & Sammons, 2016; Trent et al., 2019). In particular, Mendelson et al. (2014) suggested that teachers working in disadvantaged urban schools urgently needed interventions such as these to better manage their own emotions, given the challenging teaching environment. In addition to the positive effects for teachers themselves and the overall culture within the school, the PCSMM further postulates that improved teacher socio-emotional competencies have a positive effect on the classroom climate, teacher-pupil relationships, and adolescent outcomes (Jennings & Greenberg, 2009; Meiklejohn et al., 2012). Consequently, providing teachers with the opportunity to practice mind-body interventions may positively impact the school climate more generally.

10.4.2 *Considerations for Future Research*

Within any considerations for future research exploring school-based interventions, it should be noted that there are significant challenges associated with conducting research in schools. In terms of the practical issues; arguably the biggest challenge in school-based research is accessing and developing positive working relationships with schools (Plummer et al., 2014). This requires the support of gatekeepers (school staff) who have the influence to grant or restrict access. However, research has noted low levels of replies to research requests (Bonnell et al., 2018; Brown, 2019), possibly due to a reluctance to disrupt routines and pupils learning. Moreover, gatekeepers may not see the value of the research, reducing their willingness to offer up time and resources (Brown, 2019; Oates & Riaz, 2016). If and when researchers are successful in accessing school populations, there are further issues related to research designs in the school context, particularly for RCTs (Dawson et al., 2018; Midford et al., 2000). RCTs require substantial alterations to the school processes and procedures, particularly in relation to the randomisation component. Therefore, researchers have suggested alternatives, such as cluster RCTs as in the current study, to reduce the disruption to school timetables. However, cluster-based designs require larger sample sizes to achieve statistical power (Jaycox et al., 2006).

In addition to the practical challenges, there are also ethical challenges in research with schools, including considerations for informed consent from minors; a group considered vulnerable by the BPS (2018). As noted by the BPS (2018), there is no "one size fits all approach" (p. 15) and consent procedures should be dependent on the age and developmental abilities of participants. However, it is agreed that for children and adolescents under the age of 16, consent from parents or guardians is necessary (this may also include the Head Teacher in school-based research). Seeking informed opt-in consent

from parents has the potential to bias the sample, with decreases in participant rates, leaving only the children with the most engaged parents eligible to participate (Jaycox et al., 2006; O'Donnell et al., 1997; Plummer et al., 2014; Spence et al., 2015), who are more likely to be from higher SES backgrounds (Litt, 2002; Spence et al., 2015). Given these potential risks for bias, the current study sought informed consent from the Head Teacher and opt-out consent from parents and guardians. This approach to parental consent was also adopted in other school-based research exploring yoga (Conboy et al., 2013; Noggle et al., 2012), mindfulness (Kuyken et al., 2013, 2017), and wider mental health and wellbeing provision (Harding et al., 2007; Kidger et al., 2016; Smith et al., 2015; Stansfeld et al., 2004). Moreover, informed consent was sought from the adolescents themselves, respecting their autonomy and providing them with sufficient information to inform their choice to participate (BPS, 2018).

Despite these challenges, the current study provides evidence that it is feasible to conduct research in school settings; more specifically, a three-arm feasibility cluster RCT. Therefore, an RCT with multiple schools in the UK is necessitated to advance the evidence base further. As discussed in Chapter 2 (Section 2.4.2), the mindfulness field is more advanced than the yoga field in the UK. As such, there is currently an ongoing trial exploring the effectiveness and cost-effectiveness of MiSP's .b intervention for enhancing the mental health, wellbeing, and social-emotional functioning of adolescents (Kuyken et al., 2017). While the data from this study is not yet available at the time of writing (September 2021), it points to the practicality and feasibility of a large-scale cluster RCT exploring the impact of mind-body interventions for school-aged children and adolescents. Considering a wide-scale study into the effects of mindfulness is already underway in the UK, future research may seek to explore the impact of school-based yoga. Similar to the design employed by Kuyken et al. (2017), it may be feasible to adopt

a two-arm trial, comparing a yoga intervention with PHSE as usual. To enable the field going forwards, the current research has contributed an acceptable Yoga4Schools curriculum for future research to implement within research.

To address a further disparity between the fields of yoga and mindfulness, future research may also seek to undertake a qualitative thematic synthesis of existing studies. Within the mindfulness evidence base, Sapthiang et al. (2019) synthesised seven qualitative studies into the effects of mindfulness. The qualitative literature surrounding the effects of yoga has grown in recent years with the publication of several studies (in addition to the current research; Butzer et al.,2017; Conboy et al., 2013; Case-Smith et al., 2010; Dariotis et al., 2016; Wang & Hagins, 2015). Therefore, there may be benefits in synthesising this literature, bringing together multiple studies to contribute a high-level perspective of the effects of yoga for children and adolescents.

10.5 Final Conclusions

This research sought to explore the impact of universal school-based yoga and mindfulness interventions for a previously neglected population; adolescents living in an area of high deprivation, attending a mainstream secondary school, in the UK. Previous research in the yoga field has generally neglected UK populations, focusing on the impact of yoga within the American education system. In contrast, there has been a recent growth in the UK-based mindfulness literature, but this has generally focused on the impact in fee-paying schools and/or with targeted or self-selecting groups of adolescents. Therefore, the current work has addressed this gap within the yoga and mindfulness literature, contributing a novel perspective and extending existing knowledge. The use of a mixed methods approach allowed a more comprehensive and holistic viewpoint of the impact and process of implementing mind-body interventions within the school context. Consequently, the current research gives further credence to the importance of mixed

methods when evaluating complex health interventions. In addition, the agreement, dissonance, and silence between the quantitative and qualitative methods contributed a more nuanced perspective than what could be achieved using a singular methodology.

Taken together, this research extends the growing evidence base that suggests that yoga and mindfulness interventions are acceptable within the school environment, delivered in a universal way, to adolescents living in some of the most deprived areas of the country. The current work supports previous research and suggests that yoga and mindfulness has benefits for the mental health, wellbeing, and cognitive functioning for adolescents; considering the demographics of the sample as highly deprived, these findings are particularly noteworthy and have the potential to support at-risk and vulnerable adolescents. Furthermore, the research shed light on some of the main facilitators and barriers to implementation and delivery, providing insight and learning for other schools who may be interested in adopting mind-body interventions. This may be particularly pertinent given the recent changes to the PSHE curriculum to make health education compulsory within mainstream schools. Additionally, the findings contributed to the wider debates within the literature surrounding school-based mental health and wellbeing interventions in terms of implementation and delivery considerations.

Despite the current research providing evidence for the acceptability and perceived benefits of yoga and mindfulness interventions, these interventions are not a panacea or quick fix for childhood and adolescent mental health and wellbeing problems. This is particularly true for the current sample, who may face additional stressors associated with deprivation and SES. Nevertheless, the current findings highlight these interventions as a positive first step in supporting adolescent wellbeing and equipping them with the tools to better cope with the challenges in their everyday lives. Consequently, this research will assist schools in finding practical solutions to promote

and support the wellbeing of adolescents, which has become even more imperative in the context of increasing mental health and wellbeing problems exacerbated by the COVID-19 pandemic. Indeed, it is more important now, than ever, that we prioritise and support mental health and wellbeing.

<center>**Appendices**</center>

Appendix A: School Recruitment

Dear Sir or Madam,

The use of yoga and mindfulness in UK schools is on the rise as one of many ways of tackling the growing number of mental health and wellbeing issues facing children and young people today. International research has highlighted these programmes to have a range of potential benefits for young people including positive changes in anxiety, wellbeing, resilience, stress, sleep quality, self-esteem and emotional regulation, as well as improvements to their memory, attention and impulsivity.

The University of Westminster is conducting research into the effectiveness of mindfulness and yoga with adolescents in the UK. As a part of this, **we're offering free mindfulness and yoga programmes to one central London school for a term** (starting September 2018) to implement across a single year group (200+ pupils). I have attached an information sheet with more information.

There are a number of criteria that the selected school must meet including:
- Mainstream secondary school in London
- Mixed-gender school
- Free to attend
- No/minimal existing yoga or mindfulness practice

The research will involve randomly allocating pupils in the year group to either the mindfulness or yoga programme or a control group (lessons as normal). All pupils taking part will complete questionnaires and cognitive tasks before and after the programmes to explore any change over time. We would also like to interview a small number of staff and pupils to explore their experience, perceptions and perceived impacts of the programmes.

Upon completion of the research and based upon the findings, the **project will then fund one member of staff to be trained in yoga or mindfulness programme delivery** to ensure your school can continue to offer this provision to pupils, should the school wish.

The project is currently in the planning stages, and we wish to work with the selected school to ensure the least disruption to the school routine and minimal burden on staff.

This research will help to uncover any impact of yoga and mindfulness on adolescents in the UK and assist other schools in introducing practical, evidence-based programmes that support the mental health and wellbeing of pupils.

If you are interested in being a part of this research or have any questions, please get in touch
with Amy.Edwards@my.westminster.ac.uk.

Best Wishes,
Amy

Yoga and Mindfulness in Schools:
Impact on pupils' wellbeing & cognition

What is this research about?

The University of Westminster is conducting research to explore the effectiveness of yoga and mindfulness programmes in UK schools on pupils' wellbeing and cognition. Both of these programmes have been growing in popularity with schools but there is limited UK-based research regarding their impact. The research will compare the change over time between pupils who receive a mindfulness or yoga programme and those who do not. This will help to build the UK-evidence base for these programmes and support schools with practical, evidence-based programmes to improve the wellbeing of pupils.

What will the research involve?

Your school will be provided with free mindfulness and yoga programmes, delivered by a trained teacher, for 8-10 weeks starting in September 2018. These programmes will be delivered to a year group of 200+ pupils (one year group or multiple years) within the school timetable. Mindfulness and yoga lessons will last between 45-60 minutes, depending on the length of the school period. Pupils will be randomly allocated to a yoga or mindfulness programme or a control group (timetable as usual).

The research will involve online questionnaires before and after the programme, exploring changes in stress, wellbeing, resilience, self-compassion and sleep quality. Cognitive tasks will also be completed by pupils before and after the programmes to explore attention, memory and inhibition. Additionally, a small number of pupils and staff members will be interviewed to better understand their perceptions, experiences and perceived impacts of the programmes.

The participation of pupils and staff in completing these research measures is on an entirely voluntary basis. Should any staff member or pupil not want to participate they can decline or withdraw at any point, without consequence.

Can any school take part?

We are looking to recruit one mainstream secondary school that is based in London. A number of inclusion and exclusion criteria apply:

Inclusion Criteria	Exclusion Criteria
- Secondary school in London - Cohort of 200+ students - Willingness to embed yoga and mindfulness into current lessons in the timetable for one term	- Fee paying schools - Prior embedding of mindfulness or yoga in the curriculum - Single sex schools

What will happen with the data provided by my school/pupils?

The data gathered will inform a PhD thesis and will be used to generate a number of research reports and publications. Within these, the identity of the school and all participants will remain anonymous so there is no way of identifying which school or individuals participated in the research.

The data generated by the interviews, online questionnaires and cognitive tasks will be confidential and linked via a self-generated code. Any information with identifying details will stored securely at the University of Westminster for 3 years and then destroyed. All anonymised data (e.g., questionnaire responses) will be kept separately, and securely stored electronically in line with data protection procedures.

What are the benefits of taking part?

You have the opportunity to introduce mindfulness and yoga programmes into the timetable for 8-10 weeks free of charge. In doing so, you will be contributing to the study of the effectiveness of these new programmes for pupils' mental health, wellbeing and cognition.

Are there any disadvantages of taking part?

The project will require some organisational and administrative resources to set up and run the programmes and research. This will involve timetabling the yoga and mindfulness sessions, finding rooms large enough for yoga classes and liaising with the researchers. The project is currently in the planning stages, and we wish to work in partnership with the selected school to ensure the least disruption to the school routine and minimal burden on staff.

Who can I contact if I have questions or concerns?

If you have any questions or concerns about the research, please get in contact with Amy Edwards at the University of Westminster:

✉   Amy.Edwards@my.westminster.ac.uk

⊟   Psychology Department, Faculty of Science and Technology, University of
        Westminster, 115 New Cavendish Street, London, W1W 6UW

Appendix B: Ethics Approval 2018

UNIVERSITY OF
FORWARD
THINKING
WESTMINSTER▦

Dear Amy

I am writing to inform you that your application was considered following response to conditions by the University Research Ethics Committee Acting Chair on 31 August 2018.

The proposal was **approved** by Chair's Action.

Please note the following issues that need to be fulfilled:

1. Insurance Cover note from Procurement Team should be obtained and carried when conducting off-site research.
2. Please add the Dean's contact details as a point of contact for 'complaints' to the documentation for the potential participants and the School head-teacher, and other School colleagues involved in the research.
3. Online Qualtrics Survey screens will need to remove the reference to Psychology Dept. REC approval and change to UREC approval.
4. Approach the School Pastoral Team to include a point of contact for participants who may wish to seek further support.

Kind regards
Huzma
Huzma Kelly
University Research Ethics Committee
I am advised by the Committee to remind you of the following points:

Your responsibility to notify the Research Ethics Committee immediately of any information received by you, or of which you become aware, which would cast doubt upon, or alter, any information contained in the original application, or a later amendment, submitted to the Research Ethics Committee and/or which would raise questions about the safety and/or continued conduct of the research.

The need to comply with the GDPR 2018 and Data Protection Act 2018.
The need to comply, throughout the conduct of the study, with good research practice standards.

The need to refer proposed amendments to the protocol to the Research Ethics Committee for further review and to obtain Research Ethics Committee approval thereto prior to implementation (except only in cases of emergency when the welfare of the subject is paramount).

The desirability of including full details of the consent form in an appendix to your research, and of addressing specifically ethical issues in your methodological discussion.

You are authorised to present this University of Westminster Ethics Committee letter of approval to outside bodies, e.g. NHS Research Ethics Committees, in support of any application for further research clearance.

The requirement to furnish the Research Ethics Committee with details of the conclusion and outcome of the project, and to inform the Research Ethics Committee should the research be discontinued. The Committee would prefer a concise summary of the conclusion and outcome of the project, which would fit no more than one side of A4 paper, please.

Appendix C: Ethics Approval 2019

**UNIVERSITY OF
FORWARD
THINKING
WESTMINSTER⌗**

Project title: Yoga and Mindfulness in Schools: Impact on adolescents' wellbeing and cognition Application
ID: ETH1819-2012
Date: 23 Aug 2019
Dear Amy

I am writing to inform you that your significant amendments to protocol was considered by the University Research Ethics Committee by Chair's Action on 23 August 2019.

Following receipt of clarifications and additional context, and responses to Sub-Panel's queries, the proposal was

approved.

Please ensure your Risk Assessment for research fieldwork remains up to date and also that any insurance cover note reflects the new period of study (you can do this by contacting procurement@westminster.ac.uk)

Kind regards
Huzma
Huzma Kelly
University Research Ethics Committee
I am advised by the Committee to remind you of the following points:

Your responsibility to notify the Research Ethics Committee immediately of any information received by you, or of which you become aware, which would cast doubt upon, or alter, any information contained in the original application, or a later amendment, submitted to the Research Ethics Committee and/or which would raise questions about the safety and/or continued conduct of the research.

The need to comply with the Data Protection Act 2018 and General Data Protection Regulation (GDPR) 2018. The need to comply, throughout the conduct of the study, with good research practice standards.

The need to refer proposed amendments to the protocol to the Research Ethics Committee for further review and to obtain Research Ethics Committee approval thereto prior to implementation (except only in cases of emergency when the welfare of the subject is paramount).

The desirability of including full details of the consent form in an appendix to your research, and of addressing specifically ethical issues in your methodological discussion.

You are authorised to present this University of Westminster Ethics Committee letter of approval to outside bodies, e.g. NHS Research Ethics Committees, in support of any application for further research clearance.

The requirement to furnish the Research Ethics Committee with details of the conclusion and outcome of the project, and to inform the Research Ethics Committee should the research be discontinued. The Committee would prefer a concise summary of the conclusion and outcome of the project, which would fit no more than one side of A4 paper, please.

Appendix D: Parental Opt-Out Consent Form

Dear Parents,

We will be introducing yoga and mindfulness classes into the Personal, Social, Health and Economic Education (PSHE) curriculum for some year 8 tutor groups this term. All form groups will be randomly allocated to receive 10 weeks of yoga classes, 10 weeks of mindfulness classes or 10 weeks of PSHE as usual.

We are working with The University of Westminster and City, University of London to explore the impact of yoga and mindfulness on young people's stress and wellbeing. This project has been approved by the University of Westminster's Ethics committee (ETH1718-1686).

You have been sent this letter because your child is involved in the PSHE classes taking part in this research to understand any impact of yoga or mindfulness through the completion of two questionnaires and some short, computerised tasks; these will be completed during the school day at the start and end of the autumn term. The survey will ask about your child's stress, wellbeing and sleeping habits and should not take more than 10-15 minutes to complete, while the computerised tasks are fun problem-solving and memory tasks. In addition, a small number of students will be asked to speak with a researcher about their experience of yoga or mindfulness at school, whether they have found it helpful or unhelpful and any suggestions for improvement.

Please be assured that all of the data will be anonymised, and your child will not be asked for their name during the research process. The data will be added to a larger set of data, which will only be accessed by the research team. The data gathered will inform a PhD thesis and will be used to generate a number of research reports and publications, but your child's contribution will not be identifiable.

If you **DO NOT** wish your child to participate in the surveys, tasks or interviews, please complete and return the opt-out form below or get in touch with <school details> by the 16th September 2018.

If you have any questions, please do not hesitate to get in contact with <school> or a member of the research team at The University of Westminster. If you have any complaints about the research, please contact Prof. Andrew Linn, Dean and Pro Vice Chancellor (A.Linn@westminster.ac.uk).

Contact Details

   < school details >

University of Westminster
Amy Edwards or Haiko Ballieux
✉ Amy.Edwards@my.westminster.ac.uk
✉ H.Ballieux@westminster.ac.uk

Following the information about the research, **I DO NOT wish my child**, _____ *(insert child's name),* to participate in the *(please tick as appropriate)*:

Surveys
Computer tasks
Conversation with researcher

Tutor Group: _____

Parent/Guardian Name: _____

Signature: _____

Date: _____

Appendix E: Pupils' Questionnaire Consent

Year 8 PSHRE Classes:
Wellbeing & Stress

Researchers from the University of Westminster and City University need your help to understand what effects different subjects covered in PSHE classes can have on young people's stress and wellbeing.

You have been given the link to this survey by your form teacher. This survey will ask you about how you cope with stress, your overall wellbeing and how you're sleeping. You are being asked to complete this survey twice during the Autumn term 2018.

Your participation in this questionnaire is completely voluntary. Whilst it will help us if you try and answer all the questions, you can choose not to answer any question and can exit the questionnaire at any time. It is not a test so please answer the questions honestly. The survey should take approximately 10 minutes to complete.

Your responses will be anonymised and added to a larger pool of data that can only be accessed by the research team. The data from all young people filling in this questionnaire will be analysed as a group to see any effects of different types of PSHE classes on young people's wellbeing and stress.

If you have any questions, you can ask your teacher or get in touch with one of the researchers, Amy Edwards (amy.edwards@my.westminster.ac.uk) or Haiko Ballieux (H.Ballieux@westminster.ac.uk). This project has been approved by the University of Westminster's Ethics committee (ETH1718-1686).

Please **click the below statement** if you agree to take part in the survey (You must click to continue with the survey).

○ The nature and purpose of the research has been explained and I agree to participate in this study. I understand that I am free to withdraw at any time.

→

Appendix F: Informed Consent for Pupil Interviews

Yoga and Mindfulness in Schools
Young people's consent form

It is important that you understand and agree to the things listed below before taking part (please tick if you agree ☑ or put a cross if you don't agree ✖):

☐ I understand that the research is about yoga and mindfulness classes and that I will be asked questions about these classes.

☐ I know I can refuse to answer any question or stop taking part at any time

☐ I give you permission to record what I say and understand this will be transcribed word for word.

☐ I know that the research team is talking to other pupils and our answers will be used together to understand what we think of yoga and mindfulness classes. No one will know who said what.

☐ I know that my name will not be used when talking about things I say. They won't talk about my answers anywhere other than in the report or presentation of the findings. They won't tell my parents or school what I say.

☐ If I say something that makes the team worry about my safety or the safety of someone else, they **will** tell the safeguarding lead at <name of school>. They will always tell me if they are going to speak to someone.

☐ I have been read the information sheet and given enough information about this work to decide whether or not I want to take part.

Date of Birth: Form class: Signature:

Thank you for your help!

Appendix G: Outcome Measures: Internal Consistency

Measures	Year	Cronbach's alpha	
		Pre	Post
WEMWBS	Year One	.890	.909
	Year Two	.870	.884
	Merged	.880	.899
PSS	Year One	.772	.836
	Year Two	.721	.840
	Merged	.750	.838
CAMM	Year One	.838	.804
	Year Two	.757	.826
	Merged	.796	.814
BRS	Year One	.619*	.640*
SCS-C	Year One	.704	.682*
1) Positive		.775	.761
2) Negative		.875	.909
CD-RISC	Year Two	.439*	.500*
ASRS	Year Two	.635*	.600*
ASWS	Year Two	.794	.817
1) Going to bed		.667*	.703
2) Returning to wakefulness		.842	.819
3) Falling asleep		.800	.802

Note. * Cronbach alpha < 0.7

Date of birth: ___/___/_____   Form: 8___   Gender: ☐ Male ☐ Female

Task 1

When your teacher tells you to begin, work through the following rows of letters and put a slash (/) through the 'target' letters as fast as you can in the time frame. You can work through the letters/rows in any order.

The target letters are:

R	L	F	T	O	Z

For example….

G	T	V	H	U	K	F	Z	A	B	F	T	O	S	D	H	K	Z	M	X	Y	U	A	G	D	F

Q	W	E	R	T	A	Y	U	I	O	P	A	S	D	F	G	H	L	J	K	M	Z	X	C	V	B
N	T	M	Y	S	Q	C	B	M	C	Z	K	L	J	G	D	A	P	I	Y	B	R	W	Q	E	T
U	O	L	N	J	G	D	X	V	N	O	M	J	B	P	H	L	O	K	M	I	J	N	U	H	B
I	Y	G	T	F	C	R	D	X	E	S	Z	C	W	A	Q	W	I	X	E	L	P	M	K	O	N
J	R	I	B	H	U	V	G	Y	C	F	T	X	D	N	Z	S	E	A	Q	P	W	K	E	V	F
K	P	O	I	D	U	Y	T	R	E	V	W	Q	Z	X	C	V	B	N	M	L	K	J	H	G	F
D	S	F	A	B	P	G	O	A	M	P	N	O	B	I	V	U	C	Y	X	T	I	Z	G	R	E
W	Q	L	K	J	H	F	X	D	S	E	R	U	C	H	A	D	S	F	G	J	H	K	L	Z	C
X	V	B	W	M	N	Q	J	E	W	R	T	U	U	I	O	P	M	H	N	F	Z	Z	P	L	K
O	M	J	I	N	Y	H	U	B	G	Y	V	F	T	C	D	R	X	S	E	Z	A	Q	W	Y	A
Z	G	V	Q	P	W	O	E	I	R	U	T	Y	A	L	S	K	D	J	F	H	G	Z	M	X	N
C	B	V	D	H	U	P	A	R	W	Z	X	C	V	B	N	M	A	S	D	F	G	H	J	K	L
Q	W	E	R	T	Y	U	I	O	P	Q	L	R	F	S	U	X	S	Q	A	Z	W	S	X	O	E
D	C	R	F	V	T	G	B	Y	H	Q	N	U	J	M	I	K	L	O	P	K	L	T	S	T	M
N	B	V	C	X	Z	L	K	J	H	G	F	D	S	A	P	O	I	U	Y	T	R	E	W	Q	A

Task 2

Look at the boxes across the top of the page. On top of each box is a number from 1-9. On the bottom part of each box is a symbol – so each symbol is paired with a number.

Below are boxes with numbers on the top and a blank space on the bottom. In the blank space, write the corresponding symbol for each number.

When your teacher tells you to begin, fill in as many boxes in the four rows below as you can in the time frame. Do them in order from left to right and don't skip any!

1	2	3	4	5	6	7	8	9
—	⊥	⊐	L	U	0	∧	X	=

start here!

Work through the numbers in this direction ▶

2	1	3	7	2	4	8	1	5	4	2	1	3	2	1	4	2	3	5	2	3	1	4	6	3

1	5	4	2	7	6	3	5	7	2	8	5	4	6	3	7	2	8	1	9	5	8	4	7	3

6	2	5	1	9	2	8	3	7	4	6	5	9	4	8	3	7	2	6	1	5	4	6	3	7

9	2	8	1	7	9	4	6	8	5	9	7	1	8	5	2	9	4	8	6	3	7	9	8	6

Appendix J: Interview Guide: Pupils

Interview Guide for Young People

- Introduce self and go through consent form on Qualtrics
- Confirm purpose of the research: want to speak with you to understand your perceptions, experiences and perceived impact of yoga/mindfulness
- Remind participant of right to withdraw at any point and that they don't have to answer all of the questions
- Remind about confidentiality: confidential unless there is a risk of harm to self or others
- Some of this discussion may be used to inform reports and publications but participant will not be identifiable
- Check permission to audio record before using Dictaphone

Section One: Background Information

How old are you?
How long have you been at this school? What's it like?
Do you have a favourite subject/teacher?

Section Two: Perceptions of Yoga/Mindfulness

1. Before your classes last term, what did you think yoga/mindfulness would be like?
   a. Did you have any experience of yoga/mindfulness before these classes?

2. How did you feel when your teacher told you that you would be doing yoga/mindfulness last term?

3. What, if anything, did you want to get from the classes?

Section Three: Experience of Yoga/Mindfulness Classes

4. How did you find the yoga/mindfulness classes?
   a. What was it like doing it with your whole class?
   b. What did you like most about the classes?
   c. Was there anything you didn't like?
   d. How did you find the teacher?

5. Did you do any practice in between classes?
   a. Homework? At school?

6. How do you feel now these classes have come to an end?
   a. Have you continued any of the practices you learned?

7. How did you feel when you were doing yoga/mindfulness in class?
   a. Did you feel any different before/after the class?

8. Have you noticed any changes in yourself since doing yoga/mindfulness?
   a. Physical health: pains, flexibility, energy, sleep?
   b. Mental health: Stress, anxiety, anger, depression?
   c. How you feel about yourself: self-acceptance, esteem, understanding?

9. Have you noticed any changes in your life at school since doing yoga/mindfulness?
   a. Classroom behaviour?
   b. Attention in class?
   c. Views of school?

10. Have you noticed any changes in your life at home since doing yoga/mindfulness?
    a. Relationships with family?
    b. Overall atmosphere?

11. Have you noticed any changes in your friendships since doing yoga/mindfulness?

12. Have you experienced any difficulties related to yoga/mindfulness practice?

13. Overall, how did you feel about your school introducing yoga/mindfulness into your PSHE classes?

14. To what extent would you recommend yoga/mindfulness to other pupils/schools?

15. What could be changed or improved about the classes in the future?

16. Is there anything else you'd like to add about your experience of yoga/mindfulness at school?

Appendix K: Consent Form: Professionals

Interview Consent

Researchers from the University of Westminster and City, University of London need your help to understand what effects different subjects covered in PSHE classes can have on young people's wellbeing, stress and attention. This project has been approved by the University of Westminster's Ethics committee (ETH1718-1686).

You will be asked a series of questions asking about your perceptions and experiences of different PSHE classes, including mindfulness and yoga. These conversations should last approximately 30minute.

There conversations are completely voluntary and are no right or wrong answers to any of the questions; we simply want to better understand your views, opinions, and experiences.

All of the data will be anonymised and added to a larger pool of data, which will only be accessed by the research team. With your permission, these conversations will be audio recorded and securely sent to an external agency to be transcribed word for word. The data gathered will inform a PhD thesis and will be used to generate a number of research reports and publications, but your contribution will not be identifiable.

If you have any questions about the research, please feel free to ask the researcher.

If you're happy to take part, please click/tick continue.

→

1. If you're happy to take part, please click/tick below to confirm you've read each of the below statements.

	Yes	No
I have read and understood the information about the purpose of the research.	○	○
I understand my participation is on a voluntary basis.	○	○
I understand that I can stop taking part in the conversation at any point.	○	○
I understand I do not have to answer all of the questions and can choose not to answer any of the questions.	○	○
I give permission to record what I say and understand this will be transcribed verbatim. My data will be stored securely in accordance with the Data Protection Act 1988. Once the research is complete, the digital recording will be securely destroyed.	○	○
I understand all data will be anonymised and all identifying features will be removed so no one can identify your views or responses in any reports	○	○
I understand that what I discuss will be confidential. The only exception to this is where there may be a risk of harm to yourself or others.	○	○
I am happy to take part in this research	○	○

2. What is your role?

○ Parent/carer

○ School Teacher

○ Yoga / mindfulness teacher

Appendix L: Interview Guide: Intervention Facilitator Interviews

Interview Guide for Intervention Facilitators

- Introduce self and go through consent form on Qualtrics
- Confirm purpose of the research: want to speak with you to understand your perceptions, experiences and perceived impact of yoga/mindfulness
- Remind participant of right to withdraw at any point and that they don't have to answer all of the questions
- Remind about confidentiality: confidential unless there is a risk of harm to self or others
- Some of this discussion may be used to inform reports and publications but participant will not be identifiable
- Check permission to audio record before using Dictaphone

Section One: Background Information

1. How long have you been teaching yoga/mindfulness?

2. Can you talk me through your training briefly?

Section Two: Perceptions of Yoga/Mindfulness

3. Based on your experience, what benefits can yoga/mindfulness have for children and young people?

Section Three: Experience of Yoga/Mindfulness Classes

4. Can you tell me about the yoga/mindfulness classes at this school, from your perspective?
   a. How did you feel delivering the classes?
   b. Was this school similar/different to your previous experiences?

5. How did the pupils react to an external teacher coming in?
   a. Any enablers/barriers to engagement?
   b. How did you find working with the form teacher to deliver the classes?

6. Were there any things or activities in the classes that worked well?
   a. Any activities the pupils liked or responded well to?
   b. How did this compare with your previous experiences?

7. Were there any things or activities in the classes that worked less well?
    a. Any activities that the pupils did not like or respond well to?
    b. How did this compare with your previous experiences?

8. How did you perceive the engagement in the class from the pupils across the term?

Section Four: Perceived Impact of Yoga/Mindfulness

9. Across the 10-week course, did you notice any changes in your class?
    a. In themselves?
    b. In the classroom:
        i. Behaviour
        ii. Engagement
        iii. Concentration/ attention/ focus
        iv. Overall atmosphere
    c. Any feedback from other teachers?
    d. Any other changes?

10. Did you notice any negative (i.e., adverse effects) as a result of the mindfulness/yoga classes for any of the pupils?
    a. Injuries? Psychological issues?

Section Five: Overall Comments

As you know, this has been a pilot study to explore if yoga/mindfulness can be delivered to whole classes i.e., a universal approach within year groups.
    11. What do you think of these approaches for supporting wellbeing at school?

12. What are your views about delivering yoga/mindfulness in this way?
    a. To what extent does it "work"?
    b. What could be changed to make it "work" better?

13. Based on your experience, what could be changed or improved about the classes in the future to suit pupils?
    a. Any practical challenges that could be overcome?
    b. Any changes to the curriculum?
    c. Any learning for other schools?

14. To what extent would you recommend yoga/mindfulness classes to other teachers or other schools?
    a. Universal approach?
    b. Targeted?

15. Is there anything else you'd like to add about yoga/mindfulness at school?

Appendix M: Interview Guide: School Staff Interviews

Interview Guide for Year 8 form tutors

- Introduce self and go through consent form on Qualtrics
- Confirm purpose of the research: want to speak with you to understand your perceptions, experiences and perceived impact of yoga/mindfulness
- Remind participant of right to withdraw at any point and that they don't have to answer all of the questions
- Remind about confidentiality: confidential unless there is a risk of harm to self or others
- Some of this discussion may be used to inform reports and publications but participant will not be identifiable
- Check permission to audio record before using Dictaphone

Section One: Background Information

1. How long have you been a teacher at this school? What do you teach?

Section Two: Perceptions of Yoga/Mindfulness

2. How did you feel when yoga/mindfulness was introduced into the curriculum for your class?
    a. Why do you think the school chose to introduce yoga/mindfulness?

3. Did you have any expectations/hopes about what these classes could do for your pupils?
    a. What did you hope they could gain from the classes?

Section Three: Experience of Yoga/Mindfulness Classes

4. Can you tell me about the yoga/mindfulness classes, from your perspective?

5. How did the pupils react to an external teacher coming in?
    a. Any enablers/barriers to engagement?
    b. How did you and the teacher work together?

6. Were there any things or activities in the classes that worked well?
    a. Any activities the pupils liked or responded well to?

7. Were there any things or activities in the classes that worked less well?

a. Any activities that the pupils did not like or respond well to?

8. How did you perceive the engagement in the class from the pupils?
   a. What could have been done differently to promote more engagement?

Section Four: Perceived Impact of Yoga/Mindfulness

9. To what extent have you noticed any changes in your class since doing yoga/mindfulness?
   a. In the classroom:
      i. Behaviour
      ii. Engagement
      iii. Concentration/ attention/ focus
      iv. Social skills
      v. Overall atmosphere
   b. Any feedback from other teachers/family?
      i. Relationships with the wider family?
   c. Any other changes?

10. Outside of the classes, to what extent has there been any discussion of yoga/mindfulness?
    a. Have you continued any practices as a class?
    b. Have you noticed any of the children using/talking about yoga/mindfulness?

11. Did the young people have any difficulties relating to practicing yoga/mindfulness?

Section Five: Overall Comments

As you know, this has been a pilot study to explore if yoga/mindfulness can be delivered to whole classes i.e., a universal approach within year groups.
12. What do you think of these approaches for supporting wellbeing at your school?

13. What are your views about delivering yoga/mindfulness in this way?
    a. To what extent does it "work"?
    b. What could be changes to make it "work" better?

14. As a form teacher, what do you think could be changed or improved about the classes in the future?

15. To what extent would you recommend yoga/mindfulness classes to other teachers or other schools?
    a. Universal approach?
    b. Targeted?

16. Is there anything else you'd like to add about yoga/mindfulness at school?

Appendix N: Interview Guide: School Decision Maker Interview

Interview Guide for School Lead (Head Teacher or Head of PSHRE)

- Introduce self and go through consent form on Qualtrics
- Confirm purpose of the research: want to speak with you to understand your perceptions, experiences and perceived impact of yoga/mindfulness
- Remind participant of right to withdraw at any point and that they don't have to answer all of the questions
- Remind about confidentiality: confidential unless there is a risk of harm to self or others
- Some of this discussion may be used to inform reports and publications but participant will not be identifiable
- Check permission to audio record before using Dictaphone

Section One: Background Information

1. How long have you been a teacher at this school?

Section Two: School Context

2. Can you please give me some context about the school?
   a. How many pupils?
   b. Ofsted rating?
   c. Surrounding area?
   d. % FSM
   e. Any particularly high areas of need?

3. Can you please talk me through your current provision to support the mental health and wellbeing of your pupils?

4. What are the challenges to supporting wellbeing at schools?

Section Three: Perceptions of Yoga/Mindfulness

5. Had you or the school had any experience of yoga or mindfulness before this?

6. What was the motivation behind introducing mindfulness and yoga into the school curriculum?

7. How did you feel about introducing yoga/mindfulness into the school/curriculum?

8. Did you have any expectations/hopes about what these classes could do for your pupils?

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a. What did you hope they could gain from the classes?

Section Four: Experience of Yoga/Mindfulness Classes

9. Can you tell me about the yoga/mindfulness classes, from your perspective?
   a. What worked well?
   b. What worked less well?
   c. How was any challenging behaviour managed?

10. How has the feedback been from staff and pupils?
    a. Year 8 form tutors / other staff?
    b. Pupils
    c. Parents/carers?

11. To what extent were there any practical or on the ground challenges for delivering these classes? Any learning for other schools?

Section Five: Perceived Impact of Yoga/Mindfulness

12. To what extent have you noticed any changes in your year 8 pupils since doing yoga/mindfulness?
    a. Any impact on classroom behaviour?
    b. Any effect on overall school atmosphere/ethos?

13. Did the young people have any difficulties relating to practicing yoga/mindfulness?

Section Six: Overall Comments

As you know, this has been a pilot study to explore if yoga/mindfulness can be delivered to whole classes i.e., a universal approach within year groups.

14. What do you think of these approaches for supporting wellbeing in your school?

15. What are your views about delivering yoga/mindfulness in this way?
    a. To what extent does it "work"?
    b. What could be changed to make it "work" better?

16. As a decision maker in the school, what do you think could be changed or improved about the classes in the future?

17. How do you feel now these classes have come to an end?
    a. Future / sustainability considerations

18. To what extent would you recommend yoga/mindfulness classes to other teachers or other schools?
    a. Universal approach? Targeted?

Appendix O: COREQ Criteria for Reporting Qualitative Research

COREQ Domain 1: Research Team and Reflexivity.

	Criteria	Guide Question	Researcher Response: Pupil Interviews	Researcher Response: Professional Interviews
	1. Interviewer	Which author/s conducted the interview?	The author (AE) conducted all interviews independently.	
	2. Credentials	What were the researcher's credentials?	AE has a BSc in Psychology, MSc in Psychology and was completing a PhD in Psychology at the time of the research.	
	3. Occupation	What was their occupation at the time of the study?	AE was a full-time PhD student.	
Personal Characteristics	4. Gender	Was the researcher male or female?	Female.	
	5. Experience and Training	What experience or training did the researcher have?	AE had over five years' experience conducting school-based research prior to this project, which involved children and adolescents aged 5-18 years and professionals. Therefore, AE was experienced in working both participant groups.	

	6. Relationship establishment	Was a relationship established prior to study commencement?	Adolescents may have seen AE around the school setting but had not had any direct contact prior to the interviews.	AE had a prior relationship with Intervention facilitators and had met the school staff briefly in planning meetings prior to interviews.
Relationship with participants	7. Participant knowledge of the researcher	What did the participants know about the researcher?	Participants had no prior knowledge of AE. At the start of all interviews, AE explained that she worked at a University (with no links to the school or intervention teachers) and was interested in their opinions of classes in case other schools wanted to introduce mind-body interventions.	Professionals knew AE as the researcher managing the project for her PhD course of study.
	8. Interviewer characteristics	What characteristics were reported about the interviewer?	AE was a PhD student at the time of writing. Going into the project, AE wrote down her biases and assumptions in a reflexive journal (a summary of this can be found in Chapter 1, Section 1.3)	

COREQ Domain 2: Study Design.

	Criteria	Guide Question	Researcher Response: Pupil Interviews	Researcher Response: Professional Interviews
Theoretical framework	9.Methodological orientation and theory	What methodological orientation underpinned the study?	Thematic analysis underpinned the research.	
Participant Selection	10. Sampling	How were participants selected?	Participants were selected by teachers to be a purposeful sample encompassing a variety of demographics and experiences (e.g., both those who liked and did not like the interventions).	All facilitators hired to deliver interventions and all classroom teachers whose classes took part were invited to participate in interviews.
	11. Method of Approach	How were participants approached?	Participants were approached face-to-face via their schoolteachers and invited to participate in interviews with the researcher.	Professionals were approached via email and invited to participate in interviews at the end of the intervention.
	12. Sample Size	How many participants were in the study?	In Year 1, 21 participants took part; in Year 2, 24 participants took part, totalling 45 adolescents.	In Year 1, 9 professional took part; In Year 2, 10 professionals took part, totalling 19 interviews with 16 participants (some intervention facilitators were the same in both years).

	13. Non-Participation	How many people refused to participate or dropped out? Reasons?	School staff did not report how many pupils declined to participate. On the interview days, two participants were found to not be present at school and one participant needed to leave halfway through the interview for an appointment.	No participants directly refused to participate. However, in Year 2, 3 school staff did not reply to multiple requests for interviews.
Setting	14. Setting of Data Collection	Where was the data collected? E.g., home, clinic, workplace	Data was collected at the school where participants attended.	Data was collected via phone interviews for ease for busy professionals.
	15. Presence of Non-Participants	Was anyone else present besides the participants and researcher?	No – the only people present were the researcher (AE) and the participant (or group of participants for pupil interviews).	
	16. Description of Sample	What are the important characteristics of the sample?	Sample demographics are presented in Table 15 (wider participant demographics; Table 9).	Sample demographics are presented in Table 16.
	17. Interview Guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	The full interview guide in provided in Appendix J. This was amended based on its usability in the first 2-3 interviews.	There were 3 interviews guides developed for the 1) intervention facilitators, 2) schoolteachers, and 3) the school lead (Appendices L-N)

Data collection	18. Repeat Interviews	Were repeat interviews carried out? If yes, how many?	There were no repeat interviews. If pupils were not in school or available on the day of interviews, they were unable to participate (due to the permissions required from the school to only sign pupils 'off timetable' for a certain period of time).	Repeat interviews were carried out with 3 participants; 2 intervention facilitators who delivered the intervention in both years and the school lead.
	19. Audio/Visual Recording	Did the research use audio or visual recording to collect the data?	Yes – in line with ethical approval and with consent from participants, interviews were audio recoded and then transcribed verbatim.	
	20. Field Notes	Were field notes made during/after the interview or focus group?	Yes – fieldnotes were written after every interview in the researcher's reflective journal (a summary of this can be found in Chapter 1, Section 1.3)	
	21. Duration	What was the duration of the interviews or focus group?	Interviews lasted up to a full 45-minute lesion period (average 35 mins).	Interviews lasted between 25-90 minutes (average 52 mins).
	22. Data Saturation	Was data saturation discussed?	Yes – the sample was within the guidelines for qualitative research (20-50 participants) and answered the research questions in sufficient depth.	The data reached saturation and answered the research questions with multiple stakeholders providing their perspective.
	23. Transcripts Returned	Were transcripts returned to participants for comment and/or correction?	No – this was not deemed to be necessary for pupils or professionals.	

COREQ Domain 3: Analysis and Findings.

	Criteria	Guide Question	Researcher Response: Pupil Interviews	Researcher Response: Professional Interviews
Analysis	24. Number of Data Coders	How many data coders coded the data?	The data was coded by the researcher AE – the Director of Studies (TC) reviewed 29% of pupil interview transcripts and 21% of the professional transcripts.	
	25. Description of the Coding Tree	Did authors provide a description of the coding tree?	Yes – the full coding tree for pupil interviews is provided in Appendix S and in Appendix T for the professional interviews.	
	26. Derivation of Themes	Were themes identified in advance or derived from the data?	Themes were derived inductively, closely related to the content of the data.	
	27. Software	What software, if applicable, was used to manage the data?	Nvivo software version 12 was used to support the analysis of the data.	
	28. Participant Checking	Did participants provide feedback on the findings?	An anonymous overview of findings was communicated to the school and to the external intervention facilitators.	
	29.Quotations Presented	Were participant quotations presented to illustrate the themes? Was each quotation identified?	Yes – quotes are presented throughout to illustrate themes. Quote authors were identified by a participant number (which includes if they were a part of the yoga or mindfulness intervention) and gender (for the pupils) or role (for professionals).	
	30. Data and Findings Consistent	Was there consistency between the data presented and the findings?	Yes – quotes are presented throughout each theme to highlight the consistency between data and themes.	

Reporting	31. Clarity of Major Themes	Were major themes clearly presented in the findings?	Yes – there were 3 major themes with associated subthemes (see Table 30)	Yes – there were 4 major themes with associated subthemes (see Table 32)
	32. Clarity of Minor Themes	Is there a description of diverse cases or discussion of minor themes?	Yes – where there was diversity in the data these instances are highlighted (e.g., Chapter 7, Section 7.2.2.1 regarding the facilitators who displayed negative qualities).	Yes – where different stakeholders had divergent views, these are highlighted (e.g., Chapter 8, Section 8.2.3.1 where professionals described different behavioural management strategies).

Appendix P: Fidelity of Intervention Session Logs

Reflective Log

Researchers from the University of Westminster and City University of London need your help to understand what effects different subjects covered in PSHE classes can have on young people's wellbeing, stress and attention. This project has been approved by the University of Westminster's Ethics committee (ETH1718-1686).

Taking part in this reflective log is voluntary and there are no right or wrong answers to any of the questions; we simply want to better understand your views, opinions, and experiences during the delivery of the yoga curriculum in the classroom.

All of the data will be anonymised and added to a larger pool of data, which will only be accessed by the research team. The data gathered will inform a PhD thesis and will be used to generate a number of research reports and publications, but your contribution will not be identifiable.

If you have any questions about the research, please feel free to ask the researcher.

If you're happy to take part please click below to confirm.

○ The nature and purpose of the research has been explained and I agree to participate in this reflective log. I understand that I am free to withdraw at any time.

1. Please enter the date of the class.

Please enter in the format: DD/MM/YYYY

_____

2. What form group were you teaching?

3. On a scale of 1 -10, how engaged were the students in your class today?

| Not at all | A little | A moderate Amount | A lot | A great deal |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

4. Expressed as a percentage, to what extent do you feel you delivered the class according to the prescribed curriculum? Please remember there are no right or wrong answers.

Not at all   Partially   Completely

0   10   20   30   40   50   60   70   80   90   100
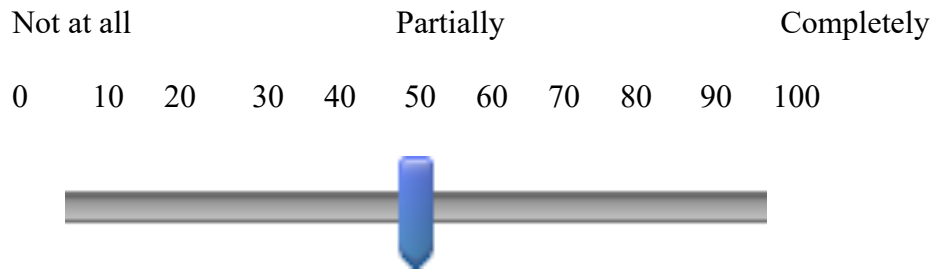
5. Reflecting on today's class, what went well?

_____

_____

6. Reflecting on today's class, what went less well/did not go as planned?
Did you have to make any adaptions to the class?

_____

_____

7. Do you have any further reflections about today's class?

Appendix Q: Normality Data for Statistical Tests

Note. *Denotes a significant violation from normality ($p < .05$)

Q.1 Pre-Post Intervention Wellbeing Measures

Wellbeing

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.967	35	.375	-.289	1.287	.450
	Yoga	.960	35	.225	-.282	-.289	
	Mindfulness	.968	31	.130	-.381	1.732	
2	Control	.961	25	.432	-.425	.464	.814
	Yoga	.983	40	.792	-.082	-.110	
	Mindfulness	.831	37	.000*	-1.842	4.523	
Merged	Control	.981	60	.465	-.240	.771	.921
	Yoga	.981	75	.323	-.170	-.266	
	Mindfulness	.926	78	.000*	-.777	2.552	

Stress

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.987	35	.681	.089	-.335	.453
	Yoga	.976	38	.590	.104	-.049	
	Mindfulness	.944	44	.034*	.780	.876	
2	Control	.969	29	.526	-.488	1.265	.680
	Yoga	.983	40	.789	.013	.026	
	Mindfulness	.975	39	.526	.050	-.281	
Merged	Control	.983	64	.520	-.135	.066	.869
	Yoga	.987	78	.616	.065	-.085	
	Mindfulness	.967	83	.025*	.631	.842	

Mindfulness

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.978	32	.729	.329	-.126	.289
	Yoga	.990	30	.990	.142	.180	
	Mindfulness	.957	39	.143	.609	1.665	
2	Control	.967	25	.560	.641	.699	.568
	Yoga	.971	39	.398	-.114	.317	
	Mindfulness	.951	38	.097	.530	-.455	
Merged	Control	.971	57	.189	.511	.224	.164
	Yoga	.985	69	.601	-.018	.257	
	Mindfulness	.982	77	.350	.363	.711	

Resilience

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.965	36	.298	.004	.914	.121
(BRS)	Yoga	.975	37	.569	.006	-.680	
	Mindfulness	.887	42	.001*	-1.536	3.596	
2	Control	.942	23	.200	.055	.939	.747
(CD-	Yoga	.942	38	.049*	-.503	-.012	
RISC)	Mindfulness	.901	38	.003*	-1.042	1.605	

Self-Compassion

Year	Subscale	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
			W	df	Sig.			
1	Positive	Control	.949	34	.115	.744	1.348	.153
		Yoga	.971	29	.590	-.592	.508	
		Mindfulness	.940	40	.034*	-.906	1.425	
	Negative	Control	.937	34	.051	.894	2.440	.478
		Yoga	.959	30	.290	.134	-.689	
		Mindfulness	.940	40	.034*	.776	.461	

Self-Regulation

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
2	Control	.886	25	.009*	1.161	4.573	.238
	Yoga	.958	39	.157	.485	.047	
	Mindfulness	.966	36	.356	.020	1.007	

Sleep

Year	Sub scale	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
			W	df	Sig.			
2	Going to bed	Control	.931	25	.091	-.645	1.852	.940
		Yoga	.968	38	.347	-.584	.786	
		Mindfulness	.977	34	.684	.107	.351	
	Returning to wakeful-ness	Control	.918	22	.068	-.894	1.309	.577
		Yoga	.957	38	.152	-.410	1.205	
		Mindfulness	.944	33	.088	.408	-.497	
	Falling asleep	Control	.922	25	.056	-.947	.778	.923
		Yoga	.956	38	.144	.610	.731	
		Mindfulness	.977	33	.694	.00	-.451	

Q.2 Pre-Post Session Mood Measures

Positive Affect

Year	Session	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
			W	df	Sig.			
2	1	Control	.887	25	.010*	-.344	1.158	.348
		Yoga	.743	41	.000*	2.648	9.840	
		Mindfulness	.822	56	.000*	2.032	7.677	
	2	Control	.665	25	.000*	-2.645	8.672	.097
		Yoga	.808	28	.000*	.083	1.850	
		Mindfulness	.739	55	.000*	2.237	6.457	
	3	Control	.820	42	.000*	.484	1.562	.423
		Yoga	.711	41	.000*	2.363	9.730	
		Mindfulness	.777	54	.000*	1.688	3.142	

Negative Affect

Year	Session	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
			W	df	Sig.			
2	1	Control	.931	35	.089	-.625	.848	.054
		Yoga	.592	41	.000*	-2.849	7.962	
		Mindfulness	.854	56	.000*	-1.149	.823	
	2	Control	.929	25	.080	.452	-.212	.080
		Yoga	.857	28	.001*	-.290	.676	
		Mindfulness	.737	55	.000*	-2.375	7.383	
	3	Control	.855	42	.000*	1.038	1.491	.000*
		Yoga	.808	41	.000*	-1.375	1.960	
		Mindfulness	.762	54	.000*	-2.348	8.735	

Q.3 Cognitive Tasks

Year	Condition	Measure	Shapiro-Wilk			Skewness	Kurtosis
			W	df	Sig.		
2	Yoga	SLCT	.965	37	.283	.413	-2.550
		DSST	.966	37	.320	-.333	1.378
	Mindfulness	SLCT	.977	30	.750	.208	-.561
		DSST	.948	30	.148	.667	1.046

Q.4 Acceptability Measures

Enjoyment

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.922	50	.007*	-.282	-.899	.895
	Yoga	.924	52	.003*	-.186	-.103	
	Mindfulness	.956	51	.058	-.165	-.333	
2	Control	.909	43	.002*	.628	-.516	.657
	Yoga	.957	50	.067	.032	-.825	
	Mindfulness	.912	51	.001*	.392	-.704	
Merged	Control	.938	93	.000*	.154	-.928	.683
	Yoga	.950	102	.001*	-.044	-.504	
	Mindfulness	.942	102	.000*	.074	-.729	

Managing Stress and Wellbeing

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.930	50	.005*	.643	.019	006*
	Yoga	.903	51	.001*	-.146	-1.274	
	Mindfulness	.912	51	.001*	.043	-1.312	
2	Control	.888	41	.001*	.753	-.193	.020*
	Yoga	.866	50	.000*	-.087	-1.566	
	Mindfulness	.898	51	.000*	.461	-1.027	
Merged	Control	.911	91	.000*	.720	-.040	.000*
	Yoga	.890	101	.000*	-.095	-1.411	
	Mindfulness	.909	102	.000*	.245	-1.225	

Attitude Towards Teacher

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity of Variance
		W	df	Sig.			
1	Control	.925	50	.004*	.140	-1.076	.032*
	Yoga	.881	50	.000*	-.782	-.254	
	Mindfulness	.838	51	.000*	-1.378	1.838	
2	Control	.877	44	.000*	-.347	-1.278	.037*
	Yoga	.871	50	.000*	-.893	.007	
	Mindfulness	.920	51	.002*	-.269	-.971	
Merged	Control	.909	94	.000*	-.056	-1.268	.034*
	Yoga	.875	100	.000*	-.840	-.131	
	Mindfulness	.886	102	.000*	-.761	-.359	

Total Number of Benefits

Year	Condition	Shapiro-Wilk			Skewness	Kurtosis	Homogeneity
		W	df	Sig.			of Variance
1	Control	.827	49	.000*	1.065	.057	.004*
	Yoga	.915	46	.002*	.783	.236	
	Mindfulness	.910	46	.002*	.398	-1.119	
2	Control	.611	67	.000*	2.076	3.597	.000*
	Yoga	.845	60	.000*	1.179	.701	
	Mindfulness	.783	66	.000*	1.254	.616	
Merged	Control	.722	116	.000*	1.517	1.285	.000*
	Yoga	.882	106	.000*	.965	.300	
	Mindfulness	.848	112	.000*	.835	-.491	

Appendix R: Additional Statistical Analyses for Chapter 6

R.1 Year One: Wellbeing Outcome Measures.

	Control			Yoga			Mindfulness			ANOVA
	N	M change	SD	N	M change	SD	N	M change	SD	
Wellbeing (WEMWBS)	35	2.60	7.84	35	.80	7.44	41	-.63	10.26	$F(2, 108) = 1.30$, $p = .276$, partial $\eta^2 = .024$
Stress (PSS)	35	-.80	1.21	38	-1.53	5.87	44	.27	7.45	$F(2, 114) = .71$, $p = .494$, partial $\eta^2 = .012$
Mindfulness (CAMM)	32	2.56	6.57	30	1.00	4.91	39	.54	6.81	$F(2, 98) = .98$, $p = .378$, partial $\eta^2 = .020$
Resilience (BRS)	36	.29	0.55	37	.07	.52	42	-.04	.82	$F(2, 112) = 2.46$, $p = .090$, partial $\eta^2 = .042$
Self-Compassion (SCS-C) +	34	2.18	6.10	29	-.62	4.36	40	-1.82	4.33	$F(2, 100) = 6.08$, $p = .003$, partial $\eta^2 = .108*$
−	34	.09	5.94	30	.43	3.92	40	-.12	4.59	$F(2, 101) = .11$, $p = .895$, partial $\eta^2 = .002$

Note. *Denotes a significant difference between groups ($p < .05$)

R.2 Year Two: Wellbeing Outcome Measures.

	Control				**Yoga**			**Mindfulness**			**ANOVA**
	N	*M change*	*SD*	*N*	*M change*	*SD*	*N*	*M change*	*SD*	
Wellbeing (WEMWBS)	25	-1.76	7.29	40	.40	7.59	37	-1.32	7.89	$F(2, 99) = .78$, $p = .462$, partial $\eta^2 = .015$
Stress (PSS)	29	.14	5.66	40	-.65	6.22	39	-.69	5.86	$F(2, 105) = .19$, $p = .822$, partial $\eta^2 = .004$
Mindfulness (CAMM)	25	.64	7.22	39	-.46	5.82	38	.37	5.80	$F(2, 99) = .29$, $p = .748$, partial $\eta^2 = .006$
Resilience CD-RISC)	23	.26	1.76	38	-0.13	2.06	38	-.37	1.85	$F(2, 96) = .78$, $p = .464$, partial $\eta^2 = .016$
Self-Regulation (ASRI)	25	.56	4.93	39	-1.13	5.89	36	.17	6.61	$F(2, 97) = .74$, $p = .478$, partial $\eta^2 = .015$
Sleep (ASWS) Going to Bed	25	-.32	3.52	38	-.39	3.01	34	-.16	2.89	$F(2, 94) = .05$, $p = .950$, partial $\eta^2 < .001$
Returning to Wakefulness	22	-.95	2.94	38	-.32	3.59	33	.12	3.48	$F(2, 90) = .66$, $p = .521$, partial $\eta^2 = .014$
Falling Asleep	25	-1.68	5.18	38	-1.18	6.65	33	-.30	4.65	$F(2, 93) = .61$, $p = .547$, partial $\eta^2 = .013$

R.3 Changes between Year One and Year Two

Comparison of Year One and Year Two on Outcome Measures (WEMWBS, PSS, CAMM) using Independent Samples t-tests.

	Control				**Yoga**				**Mindfulness**			
	N	**M**	**SD**	**Sig.**	**N**	**M**	**SD**	**Sig.**	**N**	**M**	**SD**	**Sig.**
WEMWBS												
Year One	35	-2.60	7.84	$t(58) = 2.19$, $p =$	35	.80	7.44	$t(73) = .23$, $p =$	51	-.63	10.26	$t(76) = .33$, $p =$
Year Two	25	-1.76	7.28	.033, $d = .58*$	40	.40	7.59	.819, $d = .05$	37	-1.32	7.89	.742, $d = .07$
PSS												
Year One	35	-.80	7.17	$t(62) = -.55$, $p =$	38	-1.53	5.87	$t(76) = -.64$, $p =$	43	.23	7.53	$t(81) = .65$, $p =$
Year Two	29	.10	5.62	.583, $d = .12$	40	-.65	6.22	.525, $d = .15$	40	-.72	5.79	.520, $d = .14$
CAMM												
Year One	32	1.03	7.04	$t(55) = .21$, $p =$	30	-1.30	5.11	$t(67) = -.63$, $p =$	39	-.87	6.96	$t(75) = -.85$, $p =$
Year Two	25	.64	7.22	.838 $d = .05$	39	-.46	5.82	.342, $d = .15$	38	-.37	5.80	.399, $d = .19$

Note. *Denotes a significant difference between groups ($p < .05$)

R.4 Comparison of Vulnerable (High Stress, Low Wellbeing) Pupils vs Other Pupils using One-way ANOVAs.

	Control			Yoga			Mindfulness			Sig.
	N	M	SD	N	M	SD	N	M	SD	
WEMWBS										
Vulnerable	22	4.00	7.28	23	2.96	6.44	29	2.69	7.84	$F(2, 73) = .22, p = .806$, partial $\eta^2 = .006$
Other	36	-1.11	7.76	51	-.51	7.78	48	-3.10	9.37	$F(2, 132) = 1.27, p = .285$, partial $\eta^2 = .019$
PSS										
Vulnerable	23	-1.61	7.26	23	-1.17	6.29	30	-1.97	6.31	$F(2, 73) = 0.09, p = .910$, partial $\eta^2 = .003$
Other	36	.53	5.96	51	-.84	5.99	49	.69	6.79	$F(2, 133) = .88, p = .419$, partial $\eta^2 = .013$
CAMM										
Vulnerable	22	-2.09	5.50	22	-1.36	4.71	29	1.48	5.89	$F(2, 70) = 3.14, p = .050$, partial $\eta^2 = .082*$
Other	33	2.70	7.16	45	-.58	5/95	46	-1.37	6.66	$F(2, 121) = 3.98, p = .021$, partial $\eta^2 = .062*$
BRS										
Vulnerable	13	.28	.72	10	.22	.55	13	.16	.62	$F(2, 33) = .03, p = .967$, partial $\eta^2 = .002$
Other	20	.32	.45	24	-.03	.51	25	-.24	.89	$F(2, 66) = 3.99, p = .023$, partial $\eta^2 = .108*$
CD-RISC										
Vulnerable	7	.00	1.53	13	.15	1.57	15	.07	.96	$F(2, 32) = .033, p = .967$, partial $\eta^2 = .002$
Other	16	.38	1.89	25	-.28	2.28	23	-.65	2.23	$F(2, 61) = 1.06, p = .353$, partial $\eta^2 = .034$

Comparison of Vulnerable (High Stress, Low Wellbeing) Pupils vs Other Pupils using One-way ANOVAs (continued)

	Control			**Yoga**			**Mindfulness**			**Sig.**
	N	M	SD	N	M	SD	N	M	SD	
SCS-C										
Positive										
Vulnerable	13	.00	4.67	9	.78	4.02	13	-1.46	3.67	$F(2, 32) = .84$, $p = .441$, partial $\eta^2 = .050$
Other	19	4.00	6.20	18	-1.44	4.59	25	-2.12	4.83	$F(2, 59) = 8.32$, $p = .001$, partial $\eta^2 = .220*$
Negative										
Vulnerable	13	1.69	6.07	9	.33	4.89	13	-1.62	3.43	$F(2, 32) = 1.48$, $p = .243$, partial $\eta^2 = .085$
Other	19	-.11	5.45	19	.32	3.65	25	.76	5.11	$F(2, 60) = .18$, $p = .840$, partial $\eta^2 = .006$
ASRI										
Vulnerable	8	-2.37	4.53	12	-.50	7.01	15	.47	.47	$F(2, 32) = .44$, $p = .651$, partial $\eta^2 = .026$
Other	16	1.81	4.72	25	-1.28	5.49	21	-.05	5.81	$F(2, 59) = 1.59$, $p = .213$, partial $\eta^2 = .051$
ASWS										
Going to Bed										
Vulnerable	8	-1.37	2.67	12	-.08	2.61	14	-.46	2.86	$F(2, 31) = .55$, $p = .584$, partial $\eta^2 = .034$
Other	16	.25	3.94	24	-.96	2.94	20	.05	2.96	$F(2, 57) = .84$, $p = .436$, partial $\eta^2 = .029$
Returning to Wakefulness										
Vulnerable	9	-.11	2.42	12	.92	3.68	13	-.15	2.88	$F(2, 31) = .45$, $p = .640$, partial $\eta^2 = .028$
Other	12	-1.67	3.31	24	-1.08	3.55	20	.30	3.88	$F(2, 53) = 1.32$, $p = .276$, partial $\eta^2 = .047$
Falling Asleep										
Vulnerable	9	-2.67	4.56	12	.08	3.75	13	2.08	3.43	$F(2, 31) = 4.02$, $p = .028$, partial $\eta^2 = .206*$
Other	15	-1.27	5.73	24	-2.25	5.12	20	-1.85	4.78	$F(2, 121) = .17$, $p = .846$, partial $\eta^2 = .006$

R.5 Comparison of Year One and Year Two Acceptability Measures using Mann-Whitney U Tests.

	Control				Yoga				Mindfulness			
	N	M rank	Md	Sig.	N	M rank	Md	Sig.	N	M rank	Md	Sig.
Enjoyment												
Year One	50	51.48	5.00	$U = 851, z = -1.74,$	52	49.88	5.00	$U = 1215.50, z = -$	51	57.74	6.00	$U = 982.30, z = -$
Year Two	43	41.79	3.00	$p = .081, r = .18$	50	53.19	5.50	$.57, p = .568, r = .06$	51	45.26	5.00	$2.15, p = .032, r = .21*$
Managing Stress												
Year One	50	46.33	3.00	$U = 1008.50, z = -$	51	49.70	5.00	$U = 1208.50, z = -$	51	53.60	6.00	$U = 1193.50, z = -$
Year Two	41	45.60	4.00	$.13, p = .894, r = .01$	50	52.33	6.00	$.46, p = .648, r = .05$	51	49.40	4.00	$.72, p = .470, r = .07$
Teacher Rating												
Year One	50	42.94	5.00	$U = 871, z = -1.75,$	50	47.87	8.00	$U = 1118.50, z = -$	51	60.17	8.00	$U = 858.50, z = -$
Year Two	44	52.68	7.00	$p = .081, r = .18$	50	53.13	8.00	$.92, p = .356, r = .09$	51	42.83	6.00	$3.00, p = .003, r = .30*$
Number of Benefits												
Year One	49	69.58	1.00	$U = 1098.50, z = -$	46	59.63	4.00	$U = 1098, z = -1.82,$	46	66.35	4.00	$U = 1065, z = -2.73,$
Year Two	67	50.40	.00	$3.28, p = .001, r = .30*$	60	48.80	2.00	$p = .069, r = .18*$	66	49.64	1.00	$p = .006, r = .26*$

R.6 Further exploration of differences between Year One and Year Two: Mindfulness

In examining pupils' mindfulness facilitators ratings from Year Two, there were significant differences between the three mindfulness groups, who each had a different facilitators ($\chi^2(2) = 10.28$, $p = .006$). Mann-Whitney U tests revealed that Facilitator 3 ($n = 18$, M rank = 13.31, Md = 5.00) received significantly lower ratings than Facilitator 1, with a large effect size ($n = 17$, M rank = 22.97, Md = 9.00; $U = 68.50$, $z = -2.831$, $p = .004$, $r = .48$). Although not significant, Facilitator 3 also received lower ratings than Facilitator 2 ($n = 16$, M rank = 20.22, Md = 6.00; $U = 100.50$, $z = -1.512$, $p = .135$, $r = .26$). Whilst the quantitative data cannot answer why this may be the case, the qualitative data suggests that this may be due to Facilitator 3's reactivity. Due to these differences, the acceptability measures were re-run with the lowest rated facilitator removed to better understand the impact of this on the differences between Year One and Year Two.

Comparison of Year One and Year Two Acceptability measures with the Lowest Rated Facilitator Removed from the Analysis.

				Mindfulness
	N	M rank	*M*d	Sig.
Enjoyment				
Year One	51	44.28	6.00	$U = 699.50$, $z = -1.10$, $p = .271$, $r = .12$
Year Two	32	38.36	5.00	
Managing stress and wellbeing	51	41.94	6.00	$U = 813.00$, $z = -.26$, $p = .793$, $r = .03$
Year One	33	43.36	5.00	
Year Two				
Teacher Rating				
Year One	51	46.16	8.00	$U = 655.00$, $z = -1.74$, $p = .082$, $r = .19$
Year Two	33	36.85	7.00	
Number of Benefits				
Year One	46	50.58	4.00	$U = 778.50$, $z = -1.91$, $p = .056$, $r = .20$
Year Two	44	40.19	2.00	

R.7 Comparison of acceptability correlations.

Attitudes towards teacher (Fishers r to z transformation)

		Enjoyment	Managing Stress and Wellbeing
Attitudes towards PSHE Teacher	**Control –– Yoga**	$z = -.61$, $p = .287$	$z = -1.25$, $p = .106$
	Control –– Mindfulness	$z = -.82$, $p = .206$	$z = -1.03$, $p = .151$

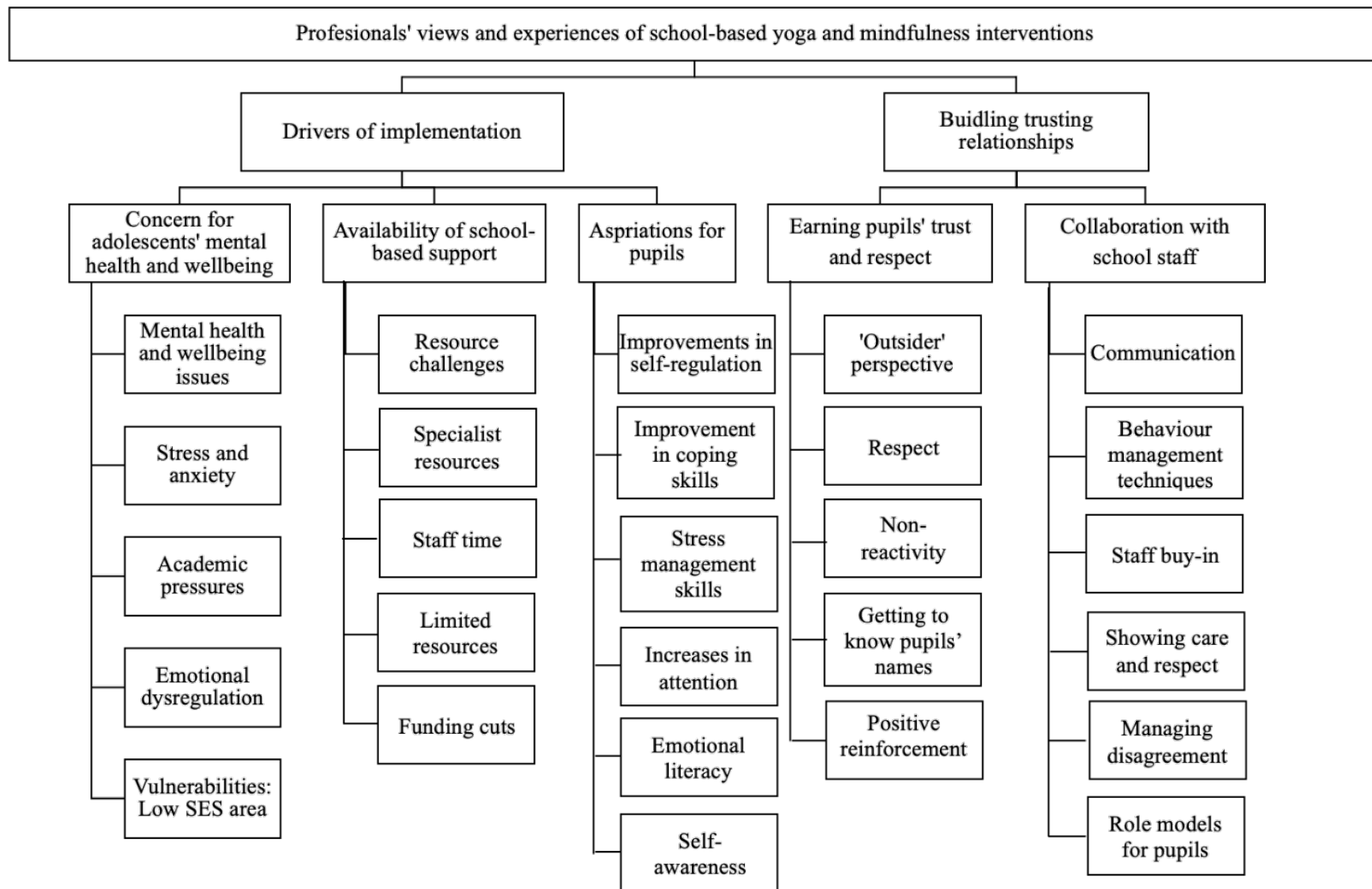*Number of perceived benefits* (Fishers *r* to *z* transformation)

		Enjoyment	Managing Stress and wellbeing	Attitude towards Teacher
Number of Benefits	**Control –– Yoga**	$z = -2.64$ $p = .004*$	$z = -2.22$ $p = .013*$	$z = -.69$, $p = .278$
	Control –– Mindfulness	$z = -2.21$, $p = .013*$	$z = -3.39$ $p = .001*$	$z = -1.73$, $p = .042*$

Note. *Denotes a significant difference between groups ($p < .05$)

Appendix S: Coding Tree for Pupils' Qualitative Interviews

Pupils' experience of school-based yoga and mindfulness interventions

- **Expectations and assumptions**
  - Stereotypes
  - Media
  - Influencers
  - Experince of friends/family
  - "Boring"

- **Processes of engagement**
  - **Positive teacher qualities**
    - Non-reactive
    - Caring
    - Respectful
    - General nice person
    - Different to other teachers
    - Negative views
  - **Agency over choices**
    - Choice to participate
    - Offered other activities
    - "Do your best" approach
    - Timing of classes
    - Different to other teachers
    - Self-conscious
    - Classroom disruptions
  - **Preference for interactivity**
    - Fun activities
    - Mindfulness classes – shock ball, mindful eating, meditation
    - Yoga – stretches and relaxation
    - Different to other classes
    - Boring classes as repetitive and slow

- **Socio-emotional benefits**
  - **Regulating emotions and calming the mind**
    - Emotion management
    - Calmness
    - Breathing exercises
    - Relaxation
    - Strategies for coping
    - Fewer disputes
  - **Positivity, confidence & strength**
    - Positive mindset
    - Changing perspectives
    - Self-confidence
    - Self-esteem
    - Interpersonal / social changes
    - Gratitude
    - Physical strength and flexibility
  - **Focus and concentration**
    - Attention
    - Fewer classroom disruptions
    - Concentration in class
    - Concentration in class

Sustainability of benefits

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Appendix T: Coding Tree for Professional's Qualitative Interviews

Coding Tree for Professional's Qualitative Interviews (continued)
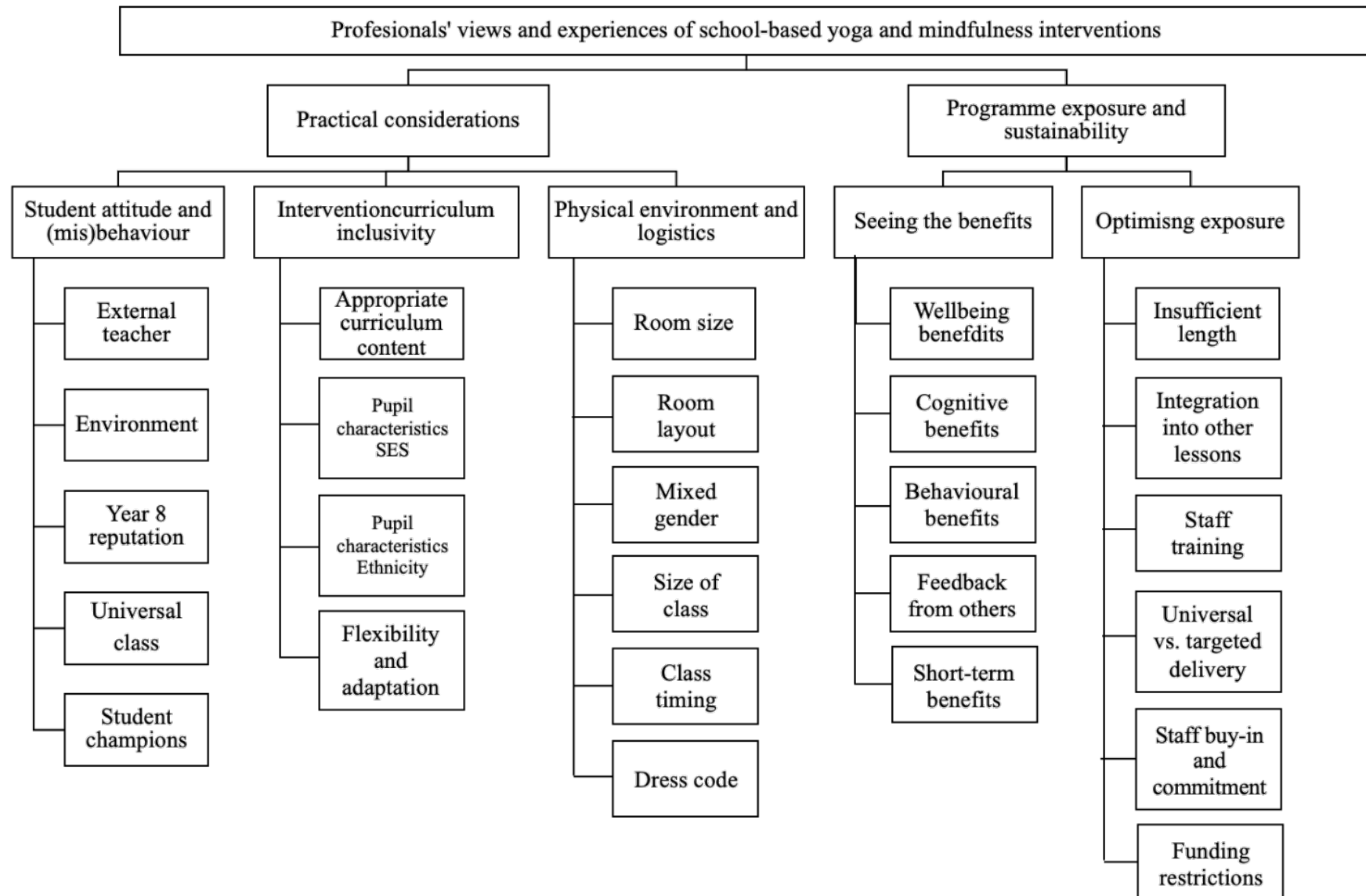
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