Case Study 1: An Evidence-Based Practice Review Report

Theme: Interventions Implemented by Parents

How effective are mindfulness-based parenting interventions in reducing externalising behaviours in children presenting with ADHD symptomology?

Summary

Mindfulness can be conceptualised as the act of "paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of the experience moment by moment" (Kabat-Zinn, 2003, p.145). In light of the growing use of approaches that aim to teach mindfulness techniques in both adult and child populations, this systematic literature review aims to examine the effectiveness of parental mindfulness interventions in improving outcomes for a group of children at high risk of school exclusion (those presenting with ADHD symptomology). Five studies met inclusion criteria (135 parents of children aged 6-15 years old) with interventions ranging from home programmes to researcher and therapist led initiatives. Effect sizes were mostly small with one medium effect size being found. Findings suggest minimal benefits of mindfulness-based parenting approaches implemented in isolation for children within this population. Future research within the UK responding to the limitations identified in this review is suggested.

Introduction

What is Mindfulness?

With its roots linked to the early traditions of many different religions (Trousselard, Steiler, Claverie & Canini, 2014) and various adaptations being practised over the years, Mindfulness can be difficult to conceptualise with a single definition. To further complicate matters, research in the field can refer to Mindfulness as both a personality construct and/or the act of drawing on techniques to enable the mind to remain in the 'here and now' (Wheeler, Arnkoff & Glass, 2016). For the purpose of this review, Mindfulness will be defined as the latter, namely the focused act of "paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of the experience moment by moment" (Kabat-Zinn, 2003, p.145). With this definition in mind, it is widely believed that practising Mindfulness regularly can facilitate a reduction in stress and lead to calmer responses in situations that might usually evoke heightened emotions (Phang & Oei, 2012). With this assurance in mind and 85% of UK adults reporting that they experience stress on a regular basis ("Forth with life", 2018), the growing popularity of Mindfulness-based approaches both within research (Brown, Ryan & Creswell, 2007) and the general population is unsurprising.

Mindfulness as an approach for children

In line with the view that Mindfulness can enhance attentiveness and improve emotional regulation, research has increasingly turned towards evaluating the effectiveness of Mindfulness-based approaches for children with neurodevelopmental diagnoses such as Autism Spectrum Disorders (ASD)

and Attention Deficit Hyperactivity Disorder (ADHD) This group of disorders share “developmental deficits that produce impairments of personal, social, academic, or occupational functioning” (American Psychiatric Association, 2014). Growing interest in the area amongst researchers may well have been fuelled further by research failing to find significant improvements for children with ADHD following pharmaceutical approaches alone (Swanson et al., 1993; Langberg & Becker, 2012). A medical shift towards “holistic treatment plans” (NICE, 2018, section 1.5) for children with neurodevelopmental diagnoses may also have played a role. Research into the impact of mindfulness has demonstrated reductions in externalising behaviour and anxiety in children with learning difficulties (Beauchemin, Hutchins, & Patterson, 2008; Haydicky, Weiner, Bdali, Miligan & Ducharne, 2012) and also revealed positive results for children with ASD, (Singh et al., 2011) and ADHD (Zylowska et al., 2008).

Mindfulness-based parenting interventions

In addition to considering mindfulness as a direct approach for children, studies have also considered the impact of wider familial factors on those diagnosed with neurodevelopmental disorders. Research has consistently found that parents of children with these conditions report experiencing heightened stress as a result of their caregiving responsibilities (Baker et al., 2003; Woolfson & Grant, 2006; Van de Weijer-Bergsma, Formsma, de Bruin & Bogels 2012). Parental stress has been linked to negative alterations in parenting behaviour (Rodgers, 1998) with the relationship between parental stress and child behaviour being described as “transactional” (Neece, Green & Baker, 2012). Naturally these research findings have led to ideas relating to

the use of mindfulness with parents as an indirect approach to improving the externalising behaviours of children. Various programmes have been tried and tested with approaches focusing on either the wellbeing of parents as individuals outside of the caregiving relationship (Benn, Akiva, Arel & Roeser2012) or the integration of Mindfulness as part of parent training with a focus on the dyadic relationship (van der Oord, Bögels & Peijnenburg, 2012). Underpinning both approaches is the idea that promoting positive mental health in parents through Mindfulness could potentially foster healthier interactions between parents and their children and improve child behaviour thus protecting the infant-caregiver relationship. Although the phenomenon of 'Mindful Parenting', a term coined by Kabat-Zinn and Kabat-Zinn in 1997 is very much in its infancy within research (Behbahani, Zargar, Assarian & Akbari,2018), studies thus far have found promising results for children with ASD (Neece, 2014) and mixed samples of children diagnosed with various developmental disabilities (Singh et al., 2007) following parental mindfulness training.

Psychological theory

With increasing evidence that mindfulness-based parent training can indirectly benefit children themselves, speculation within the literature has begun regarding possible mediating pathways. One possible mechanism has its roots in attachment theory (Bowlby, 1969). Bowlby described a child's attachment to their caregiver as being a fundamental factor in their development throughout childhood. Ainsworth and Bell (1970) later expanded on the ideas of Bowlby to detail different attachment styles that can be broadly categorised into secure

and insecure styles. Ainsworth and Bell defined secure attachments as developing when parents are responsive to their child's needs resulting in children feeling safe and comforted. In contrast, children with insecure attachments can present as avoidant or resistant to their parents attempts to soothe or interact and are bred through inconsistent or unresponsive parenting at times of need (Ainsworth & Bell, 1970). In support of this theory, alongside their empirical data, studies such as that of Zhang et al. (2017) detail anecdotal information from parents reporting increased acceptance of their child's behaviour and increased prevalence of children sharing their feelings with their parents following mindfulness training.

Another possible explanation is that parents who have engaged in mindfulness are better equipped to be able to control their emotions and thus present with proficient emotional regulation skills during parent-child interactions (Waters, 2016). Social Learning Theory (Bandura, 1977) states that behaviours are learnt through observing the actions of "role models". In line with this theory, it is therefore possible that the children whose parents have taken part in these initiatives have access to attentive and calm parental role models. Children may then be able to internalise this as a prototype for their own behaviour thus reducing their stress. In support of this, research has previously found links between maternal modelling of self-efficacy and coping responses in children (Coleman & Karakker, 2003).

Relevance to educational psychology practice and rationale

Following the publication of government reports there has been increasing documentation of the variety of roles Educational Psychologists (EPs) can adopt across contexts. A report produced by the Department of Education (DfE) lists “universal preventative” work as being an important aspect of EP practice (DfE, 2011, p5). This, in addition to growing recognition of the benefits of working systemically has led to many EP services moving away from “traditional”, direct assessment work and more towards consultation models of service delivery to engage in problem solving with key adults around the child (Sheridan, Welch & Orme, 1996). Frameworks such as the Problem Analysis Framework (Monsen, Graham, Frederickson & Cameron, 1998) and subsequent Integrated Framework (Woolfson, Whaling, Stewart & Monsen, 2003) facilitate opportunities for EPs to build on these principles and structure their thinking around wider factors that may be impacting on child development. Such thinking has its roots in Bronfenbrenners Eco-Systemic Theory (1979) which recommends consideration of family, school and wider community systems in addition to within-child factors. This ability to think more widely alongside EPs being recognised for their contribution in “parent training” and “therapeutic work” (Department of Health, 2008, p46) places EPs in an ideal position to facilitate therapeutic approaches within family systems. In addition, with school exclusion rates on the rise (DfE, 2018) and poor parental mental health thought to be a contributory factor (Ford, Parker, Salim & Goodman, 2018), EP support with such initiatives could increasingly be welcomed.

Studies suggest that ADHD impacts as many as 5% of the population (Polanczyk, Willcutt, Salum, Kieling & Rohde, 2014) with children with ADHD being significantly more likely to be excluded from school than their typically developing peers (O'Regan, 2009). Considering this data and the socio-political context described above, this review aims to examine current research of the benefits of parental mindfulness training for children displaying ADHD symptoms. With the growing popularity of mindfulness approaches and scope for EP involvement, findings within the ADHD population that mirror those of previous studies may provide a new avenue for evidence-based EP practice.

Research question

"How effective are mindfulness-based parenting interventions in reducing externalising behaviours in children presenting with ADHD symptomology?"

Critical Review of the research

Literature search

In November 2018 a literature search was carried out to identify all studies pertinent to the above research question. The following databases were searched: Web of Science, ERIC, PubMed and PsycINFO using the search terms in Table 1.

Table 1

Search Terms

Search terms	Web of Science	ERIC	PubMed	PsycINFO
mindful* AND parent* AND attention deficit hyperactivity disorder OR adhd OR attention deficit disorder OR add	57	11	17	52
meditation OR MBCT OR MBSR AND parent* AND attention deficit hyperactivity disorder OR adhd OR attention deficit disorder or add	22	4	10	20
mindful* OR meditation OR MBCT OR MBSR AND carer* OR caregiver* OR mother OR father OR famil* AND attention deficit hyperactivity disorder OR adhd OR attention deficit disorder OR add	64	8	19	48

Note: Search term "add" was removed from PsycINFO searches due to the database not recognising the term.

A total of 332 studies were generated across the four databases. Table 2 details the inclusion and exclusion criteria adhered to whilst Figure 1 depicts the screening process undertaken to identify relevant studies. Rationale for the five studies being excluded following full text inspection is detailed further in Appendix A.

Table 2

Inclusion and Exclusion Criteria

	Inclusion criteria	Exclusion criteria	Rationale
1. Participants	Parents/caregivers of children 0-18 with a diagnosis of ADHD or exhibiting ADHD traits/symptomology	Parents/caregivers of typically developing children or children with other diagnosed conditions.	Review is focused on examining outcomes specifically within the ADHD population/ those exhibiting ADHD traits
2. Intervention	A) Any mindfulness-based psychoeducation, programme, training or intervention. B) Studies implementing both parent and child mindfulness-based interventions as long as these are running asynchronously and data is reported separately for parents and children	Studies implementing any mindfulness-based psychoeducation, programme training or intervention for children in parallel with parent training (simultaneous exposure) Studies assessing 'mindfulness' as an existing personality construct as opposed to psychoeducation/training	Any differences in data following the intervention could be confounded by the children themselves engaging in mindfulness practice. Review is concerned with the impact of mindfulness training as opposed to existing personality traits.
3. Outcomes	Studies must consider outcomes of the intervention/parental training for children	Studies that focus on solely parental outcomes without evaluating the impact for children	Review is focused on moving away from within-child factors and considering outcomes for children

	Inclusion criteria	Exclusion criteria	Rationale
			following interventions for parents
4. Design	Studies of any type that collect primary empirical data	Studies that do not collect primary empirical data	The review is focused on examining primary empirical data. Secondary data will not be used
5. Type of Publication	Peer reviewed journal articles	Non peer reviewed journal articles including protocols, dissertations and theses	These articles have been subject to in-depth review and so are likely to meet the standard of quality required
6. Context and Publication Language	Studies published in English Studies carried out in any country and in any setting e.g. home, hospital, school, community setting	Studies published in other languages.	The researcher is monolingual and does not have access to resources to aid translation of studies into English.

Figure 1

Study Selection Process

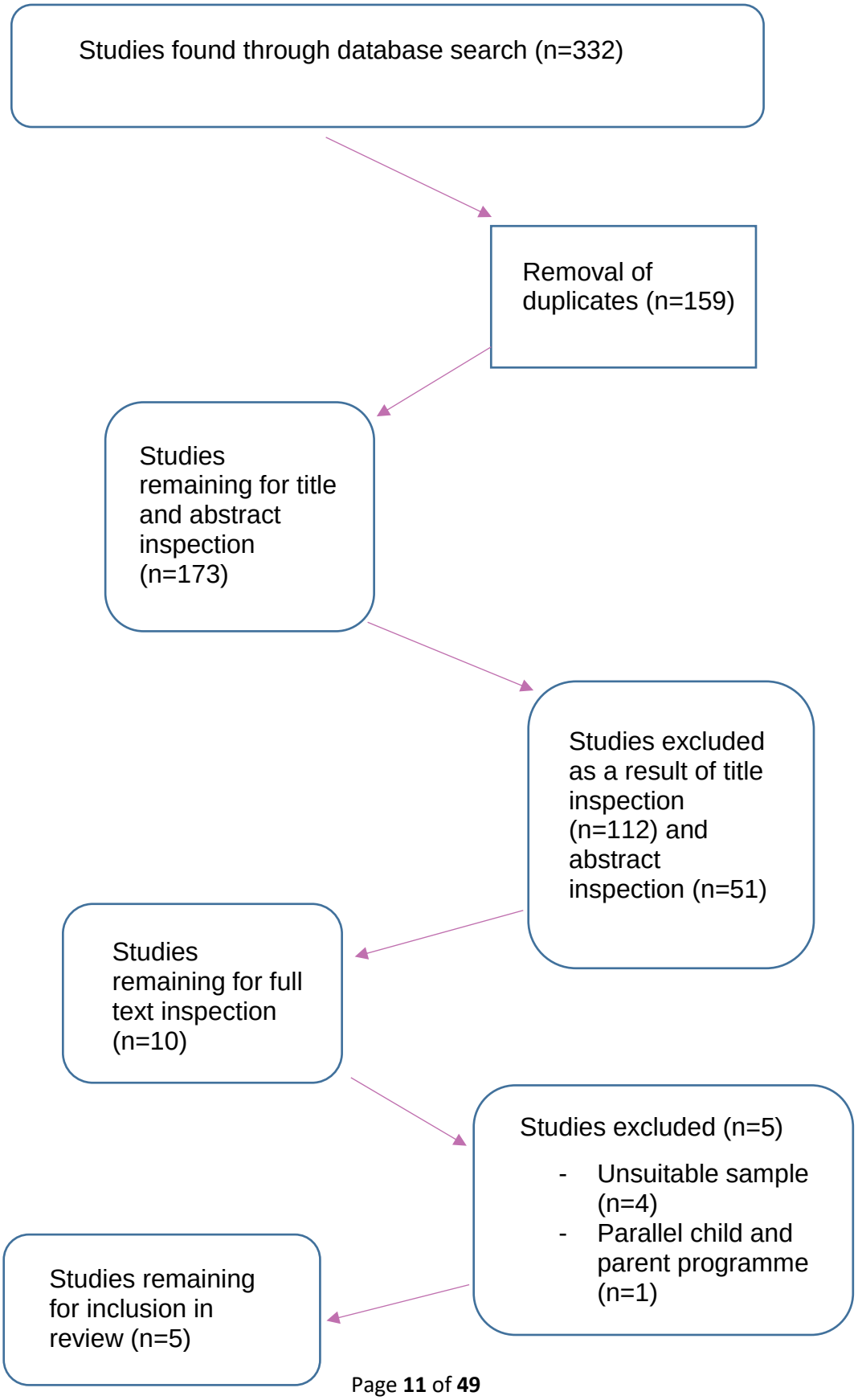

Table 3

List of the Five Included Studies

Full journal reference
Anderson, S., & Guthery, A. (2015). Mindfulness-based psychoeducation for parents of children with attention-deficit/hyperactivity disorder: An applied clinical project. *Journal of Child and Adolescent Psychiatric Nursing, 28*(1), 43-49
Gershy, N., Meehan, K.B., Omer, H., Papouchis, N., & Sapir, I.S. (2017). Randomized Clinical Trial of Mindfulness Skills Augmentation in Parent Training. *Child Youth Care Forum, 46*, 783-803
Behbahani M, Zargar F, Assarian F and Akbari H. (2018). Effects of Mindful Parenting Training on Clinical Symptoms in Children with Attention Deficit Hyperactivity Disorder and Parenting Stress: Randomized Controlled Trial. *Iranian Journal of Medical Sciences, 43*(6), 596-604
Dehkordian, P., Hamid, N., Beshlideh, K., & Honarmand, M. (2017). The effectiveness of mindful parenting, social thinking and exercise on quality of life in ADHD children. *International Journal of Pediatrics, 5*(2), 4295–4302
Singh, N. N., Singh, A. N., Lancioni, G. E., Singh, J., Winton, A. S. W., & Adkins, A.D (2010). Mindfulness training for parents and their children with ADHD increases the children's compliance. *Journal of Child and Family Studies*, *19*(2), 157–166

Critical appraisal of included studies

The Gough (2007) Weight of Evidence (WoE) Framework was used to facilitate consistent critical appraisal of the five included studies across three dimensions (WoE A, B and C). WoE A judgements involve considering the methodological quality of each study in relation to other studies of the same type. The Gersten et al. (2005) coding protocol was utilised to appraise the methodological quality of the studies with RCT designs (Gershy et al., 2017; Behbahani et al., 2018 and Dehkordian et al., 2017) and the study that used a

single-group experimental design (Anderson & Guthery, 2015). A coding protocol specifically for single-subject designs (Horner et al., 2005) facilitated appraisal of the Singh et al. (2010) study. Studies were then appraised for methodological relevance (WoE B) and topic relevance in relation to the review question (WoE C). WoE C ratings were calculated through making judgements about each study in two areas: intervention implementation and sample population. Judgements in these areas were then averaged to provide one WoE C rating per study. Judgements made within each category (WoE A-C) were averaged to provide an overall Weight of Evidence judgement (WoE D) for each study. WoE data is summarised in Table 4 with further details regarding appraisal criteria and individual study ratings provided in Appendix B. Examples of coding protocols can be seen in Appendix D.

Table 4

Weight of Evidence (WoE) Ratings

Study	WoE A	WoE B	WoE C	WoE D
Anderson & Guthery (2015)	1 (low)	1 (low)	1.5 (medium)	1.2 (low)
Gershy et al. (2017)	2 (medium)	3 (high)	1 (low)	2 (medium)
Behbahani et al. (2018)	1 (low)	3 (high)	1.5 (medium)	1.8 (medium)
Dehkordian et al. (2017)	1 (low)	3 (high)	1.5 (medium)	1.8 (medium)
Singh et al. (2010)	2.4 (medium)	1 (low)	2.5 (high)	2 (medium)

Note: <1.4 (low), 1.5-2.4 (medium) and >2.4 (high)

Participants

Across the studies, 135 participants engaged in interventions. Ages of children whose parents were participating in the studies ranged from 6-15 years old. As can be expected due to male over representation within the ADHD population, the majority of studies reported their samples to consist mainly of boys. Two studies (Singh et al., 2010 & Dehkordian et al., 2017) had all male samples. The exception was the Anderson and Guthery (2015) study who had more females than males within their sample (4:3 ratio). All studies with the exception of Anderson and Guthery (2015) recruited parents of children with confirmed diagnoses of ADHD. Although all participants in this sample were at least "exhibiting ADHD traits", this shortfall was reflected in the Gersten et al. (2005) protocol and contributed towards the study receiving a lower WoE A rating overall in comparison to other group studies.

Design

The Anderson and Guthery (2015) study used a single-group experimental design. Since a lack of control group impacts the confidence in which the researcher is able to attribute effects to the intervention, this study received a low WoE B rating for methodological relevance. Singh et al. (2010) used a multiple baseline across participants design. Since, it is generally accepted within the literature that single subject designs should show experimental effects using at least three participants or time points (Horner et al., 2005) this shortfall was reflected in WoE A ratings and the study was given a low WoE B rating for methodological relevance. Three studies used a RCT design (Behbahani et al., 2018; Dehkordian et al., 2017; Gershy et al., 2017). Use of random assignment increases the internal validity of studies and ensures that

any differences observed following treatment are indeed likely to be due to the treatment itself rather than to participant variables. These three studies were therefore given a high WoE B rating. Of the group-experimental studies, only the Behbahani et al. (2018) study included a follow up measure (8 weeks post intervention). The added benefit of tracking the long-term impact of the intervention was acknowledged as part of WoE A ratings.

Intervention (implementation and context)

For their intervention, Anderson and Guthery (2015) asked participants to read the book “Everyday Blessings: The Inner Work of Mindful Parenting” (Kabat Zinn & Kabat Zinn, 1997) in their own time. Since good practice guidelines recommend that Mindfulness interventions are carried out by trainers with expertise (UK Mindfulness Trainers Network, 2010), the lack of face to face delivery of the intervention was considered as part of WoE C. In addition, since the intervention took place at home, it is not possible to infer the level of commitment participants had to the intervention and therefore how many sessions they actively engaged in. The extent to which any improvements can be attributed to the intervention as opposed to other variables especially in such a small sample size is therefore questionable. Concerns regarding the intervention fidelity therefore resulted in this study receiving a low rating for the ‘intervention implementation’ aspect of WoE C (see appendix B7).

All three group experimental studies delivered face to face mindfulness interventions with two studies (Dehkordian et al., 2017; Behbahani et al., 2018) using the same 8 week manualised intervention (Bogels & Restifo, 2014)

based on Mindfulness-based Stress Reduction (MBSR, Kabat-Zinn, 1984). These studies however, did not describe the expertise of the professional delivering the intervention resulting in the study receiving a medium WoE C rating for 'intervention implementation' (Appendix B7). In contrast, Gershy et al. (2017) did describe the training undertaken by the interventionists but only delivered one 90 minute mindfulness session to their participants. Since mindfulness interventions typically involve at least eight weeks of training and there is not yet sufficient research to warrant shorter delivery (Carmody & Baer, 2009, De vibe et al., 2017), this study received a low WoE C rating for 'intervention implementation'.

The Singh et al. (2010) study was the only study to receive a high rating for 'intervention implementation' as part of WoE C. This was because the researchers described the professional expertise of the trainer as 'experienced' and delivered this over a 12 week period in a setting that controlled for internal validity.

None of the included studies had samples of participants from the UK. The Behbahani et al. (2018) and Dehkordian et al. (2017) studies were both conducted in Iran whilst the Gershy et al. (2017) study consisted of a sample from Israel. The Anderson and Guthery (2015) and Singh et al. (2010) studies were both carried out in the USA. Considering the generalisability of findings, since cultural norms within the USA more closely match those of the UK than Middle Eastern countries, the latter studies were given a medium rating for the

‘sample population’ aspect of WoE C ratings while the three former studies received a low rating in this area (see appendix B, Table B7).

Measures

Various instruments were used across different studies to assess child externalising behaviour with all measures used being reported to have excellent internal consistency reliability (Cronbach, 1951). Both the Behbahani et al. (2018) and the Anderson and Guthery (2015) studies used the Parenting Stress Index–Short form (PSI–SF, Abidin, 2012). This questionnaire facilitates assessment of functioning across three subscales: Difficult Child subscale, parent-child dysfunctional interaction subscale and parental distress. This measure has an internal consistency reliability of 0.9.

The Gershy et al. (2017) study assessed “child problem behaviours” using the Hebrew version of the Externalizing scale of the Child Behavior Checklist (CBCL; Achenbach, 1991). Internal consistency was reported by the authors as being 0.99.

The Singh et al. (2010) study was slightly different in that no published measures were used for data collection. The parents themselves collected data for four hours a day relating to the number of requests they made and their child’s level of compliance to these requests. The researchers did however report excellent inter-rater agreement between the two parents (92%).

Dehkordian et al. (2017) used the Pediatric Quality of Life Inventory (PedsQL, Varni, Seid & Rode, 1999) to assess child outcomes. This questionnaire has four subscales assessing school functioning, physical functioning, social functioning and emotional functioning. Internal consistency for this measure is reported to be 0.92 (Varni, 2003).

Outcomes

Two studies reported a significant improvement in externalising behaviours (Dehkordian et al., 2017; Behbahani et al., 2018). However, neither study reported effect sizes to demonstrate the magnitude of improvement. Dehkordian et al. (2017) did report an effect size to demonstrate the collective difference between the experimental groups (mindfulness, exercise and social thinking interventions) as a whole and the control group but did not report the magnitude of difference between the mindful parenting experimental group and control group specifically. Thus the effect size reported by the authors could be considered misleading. Effect sizes for all group studies were therefore calculated using the pre-post test control group calculation (Morris, 2007). This led to a medium effect size being identified for the improvement in 'quality of life' reported by Dehkordian et al. (2017) and a small effect size for the reduction in 'difficult child' behaviour reported by Behbahani et al. (2018) which was sustained eight weeks post intervention.

In addition to the above studies, Singh et al. (2010) also found increased child compliance following parental mindfulness training. However, following a lack of sufficient data available within the paper and unsuccessful attempts to gain this from the authors, an effect size could not be calculated.

As for the remaining studies, although Anderson and Guthery (2015) report a reduction in difficult child behaviour, this result did not reach statistical significance. This is not surprising due to the small sample of participants likely limiting the statistical power of the study. Calculation of Cohen's d revealed a small effect size. Gershy et al. (2017) reported a significant reduction in child externalising symptoms in both their experimental and their control group and therefore no significant difference between groups. It is however worth noting that in this study, the difference between the intervention in the treatment and control group could be considered marginal as it took the form of administration of a single ninety minute mindfulness session to augment the 'treatment as usual' parent training. Again, Cohen's d revealed a small effect size. Table 5 details effect sizes for all studies.

In bringing together all WoE ratings, four of the studies (Singh et al., 2010; Gershy et al., 2017; Behbahani et al., 2018 & Dehkordian et al., 2017) received a medium WoE D rating. This was due to all of these studies being given a low rating in only one of the WoE A-C categories. In contrast, the Anderson and Guthery (2015) study received low ratings in two of the WoE A-C categories and was therefore judged to have lower methodological quality and relevance. This resulted in this study receiving a low overall WoE D rating.

Table 5

Effect Sizes for Child Outcomes

Study	Sample size	Measure	Outcome	Effect size	Description of effect size	Weight of Evidence (WoE) D
Anderson & Guthery (2015)	N=7 (single group)	Parenting Stress Index, Short Form (PSI-SF, Abidin, 2012)	Reduction in difficult child behaviour (not significant)	d= -.44 (Difficult Child subscale)	Small	Low 1.2
Gershy et al. (2017)	N = 38 (19 control, 19 experimental)	Externalizing scale of the Child Behavior Checklist (CBCL; Achenbach, 1991)	Reduction in child externalising behaviour in control and experimental groups (no significant difference between groups)	d= -.48	Small	Medium 2
Behbahani et al. (2018)	N=56 (30 control, 26 experimental)	Parenting Stress Index–Short form (PSI–SF, Abidin, 2012)	Reduction in difficult child behaviour and severity of ADHD symptomology – maintained at follow up	d= -.36 (Difficult Child subscale)	Small	Medium 1.8

Study	Sample size	Measure	Outcome	Effect size	Description of effect size	Weight of Evidence (WoE) D
Dehkordian et al. (2017)	N=32 (15 control,17 experimental)	Pediatric Quality of Life Inventory (PedsQL, Varni, 1999).	Increase in child quality of life	d=-.74	Medium	Medium 1.8
Singh et al. (2010)	N=2	Parental data collection of child compliance	Increase in child compliance	Child 1 2.92% increase	-	Medium 2
				Child 2 1.46 % increase	-	

Note. Cohen's d (1988) descriptors: 0.2(small), 0.5 (medium) and 0.8 (large). *WoE D:* <1.4 (low), 1.5-2.4 (medium) and >2.4 (high)

Conclusions and recommendations

This review examined the effectiveness of mindfulness parenting interventions in reducing externalising behaviours in children presenting with ADHD symptomology - a group highly vulnerable to school exclusion. Of note is the surprising paucity of studies within this population that consider the impact of these approaches distinct from parallel child programmes. Of the five studies identified, four of these reported improvements in child externalising behaviour following mindfulness-based interventions for parents but only two of these were reported to be statistically significant. Mostly small effect sizes were found with only one study demonstrating a medium effect size. The limited evidence available therefore suggests that 'mindful parenting' interventions in isolation offer minimal benefits for children presenting with ADHD symptomology. Since the current review focused on examining the effectiveness of indirect rather than direct approaches to behaviour modification, it is not unreasonable to expect small effects. It is however worth noting that none of the five studies included received a high WoE rating overall. Thus, despite small effects being identified, more robust research that considers the limitations addressed in this review is required before the true efficacy of these approaches can be established. Specific limitations and resulting recommendations for future research are discussed.

Firstly, it is important to note the lack of research in the field carried out in the UK. All studies included within this review were conducted in the USA or Middle Eastern countries. Thus, due to varying cultural norms, it is not possible to conclude with any certainty that the small effects demonstrated in this review

would generalise to the UK. Indeed, Gershy et al. (2017) note anecdotal concerns from their participants about mindfulness being misaligned with their cultural norms. As was detailed at the beginning of this review, mindfulness is an approach growing in popularity within the UK and so it is possible that these concerns may not be as apparent during mindfulness training conducted with participants living in the UK where such meditative approaches are generally common place. This of course is an assumption and future research conducted in the UK would therefore benefit from identifying whether any attitudinal differences between participants prior to intervention commencement do indeed impact its effectiveness.

A more obvious direction for future research lends itself to increasing the statistical power of studies through procedures that generate larger sample sizes. As noted earlier, only three of the five studies used an RCT design. In addition, two of the RCT's (Gershy et al., 2017; Behbahani et al., 2018) report high attrition rates (48% and 30% respectively). It is not unreasonable to expect such high dropout rates if we consider that for some parents, long term commitment to a research project could potentially add to already heightened levels of stress associated with parenting children with ADHD (Johnston & Mash, 2001). Future studies that pre-empt this possibility when recruiting participants would therefore be advantageous.

An issue related to sample size concerns that of intervention implementation. Anderson and Guthery (2015) and Gershy et al. (2017) were the only two studies not to find significant improvements in child externalising behaviour

following parental mindfulness training. Notwithstanding the small sample size within the former and earlier documented attrition rates in the latter study, these were the only two studies where intervention length was a questionable factor. The design of the Anderson and Guthery (2015) study alongside the small sample size makes it impossible to say with confidence that the participants actually engaged in the full length of the intervention. In support of this, the researchers do report anecdotal feedback from one of their participants stating that the length of the intervention book resulted in them finding it difficult to finish reading it. Equally, the Gershy et al. (2017) study did not sufficiently differentiate the treatments given in the experimental and control group with the only difference being the experimental group receiving one mindfulness training session. It is therefore possible that shortening the length of mindfulness interventions has the potential to reduce their impact thus explaining the absence of statistically significant findings in these studies. In a climate where cost effectiveness is paramount, future single-subject research similar to that of Singh et al. (2010) would be advantageous in determining which individuals these types of interventions are most effective for and at which point the trajectory of change happens to determine the minimum number of sessions required. Clearly such research would benefit from addressing a key limitation of the above study through demonstrating the experimental effect on at least three occasions (within and/or between participants). To summarise, the evidence available to date suggests that 'mindful parenting' as an approach in isolation has minimal benefits for children with ADHD. However, only when sufficient research using robust designs and adequately powered samples has been conducted in the UK can we begin to

assess the true impact of these approaches for this vulnerable group. Positive outcomes arising from such research have the potential to pave a new and somewhat optimistic way forward that considers intervention approaches beyond those focused on within-child factors. Central to this wider view is the need to unravel the impact of mindfulness training for children and their parents in isolation as well as parallel programmes. Following this line of research may well prove fruitful in identifying effective alternatives to dominant pharmaceutical approaches alone.

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Appendix A

List of Excluded Studies with Rationale

Study	Reason for Exclusion
Bögels, S. M., Hellemans, J., van Deursen, S., Römer, M., & Meulen, van der R. (2014). Mindful parenting in mental health care: effects on parental and child psychopathology, parental stress, parenting, coparenting, and marital functioning. *Mindfulness, 5,* 536-551.	
Lewallen, A. C., & Neece, C. L. (2015). Improved social skills in children with developmental delays after parent participation in MBSR: The role of parent–child relational factors. *Journal of Child and Family Studies, 24*(10), 3117–3129.	Samples contain parents/caregivers of children with other disabilities and sufficient data is not available to separate participants of children with ADHD (Inclusion criteria 1)
Meppelink, R., de Bruin, E. I., Wanders-Mulder, F. H., Vennik, C. J., & Bögels, S. M. (2016). Mindful parenting training in child psychiatric settings: Heightened parental mindfulness reduces parents' and children's psychopathology. *Mindfulness, 7,* 680 – 689.	
Neece, C. L. (2014). Mindfulness-based stress reduction for parents of young children with developmental delays: applications for parental mental health and child behavior. *Journal of Applied Research in Intellectual Disability, 27,* 174–186.	
Zhang D, Chan S.K.C., Lo, H.H.M., Chan, C.Y.H., Chan, J.C.Y., Ting, K.T., Gao, T.T., Ching Lai, K.Y, Bogels, S.M. and Wong, S.Y. (2017). Mindfulness-based intervention for Chinese children with ADHD and their parents: a pilot mixed-method study. *Mindfulness, 8*(4), 859–872.	Parent and child programmes running in parallel (Inclusion Criteria 2B)

Note. The five studies listed above were found using the databases detailed earlier in the text. These studies underwent full text inspection and were subsequently excluded from the review. Studies that could be confidently excluded at the title and abstract screening stage have not been detailed here.

Appendix B

Table B1

Weight of Evidence A Criteria (WoE A) for RCT's/Single-group Experimental studies

WoE A Rating	Criteria
3 (High)	1. Study meets at least 9 essential criteria 2. Study meets four or more desirable criteria
2 (Medium)	1. Study meets at least 9 essential criteria 2. Study meets at least 1 and less than 4 desirable criteria
1 (Low)	1. Study meets less than 9 essential criteria.

Note. Table criteria based on recommendations of Gersten et al. (2005) coding protocol

Table B2

Summary of Weight of Evidence A (WoE A) Ratings for RCT's/Single-group studies

Study	Number of essential criteria	Number of desirable criteria	WoE A
Gershy et al. (2017)	9	3	2
Behbahani et al. (2018)	8	3	1
Dehkordian et al. (2017)	7	2	1
Anderson and Guthery (2015)	3	1	1

Table B3

Weight of Evidence A (WoE A) Criteria for Single Subject Designs

WoE A Rating	Criteria
High	Average rating across 7 judgement areas is 2.5 or above
Medium	Average rating across 7 judgement is between 1.5-2.4
Low	Average rating across 7 judgement areas is 1.4 or below

Note. Ratings within each of the seven judgement areas were based on the following: 3=achieved all criteria, 2= achieved all but one of the criteria, 1= achieved at least one the criteria, and 0=failed to meet any criteria.

Table B4

Summary of Weight of Evidence A (WoE A) Ratings Across Seven Judgement Areas for Single Subject Designs

Study	Participants and setting	Dependent variable	Independent variable	Baseline	Experimental control/internal validity	External validity	Social validity	WoE A
Singh et al. (2010)	1	3	3	3	1	3	3	2.4

Table B5

Weight of Evidence B (WoE B) Criteria

WoE B Rating	Criteria
3	Randomised Controlled trials (RCTs): -At least one control/comparison group -Pre and post data collected for all groups
2	Cohort studies or Quasi-experimental studies (non-random assignment): -At least one control/comparison group -Pre and post data collected for all groups -For single/small N designs there should be at least 3 occasions where experimental effect is shown (across 3 participants or at 3 different time points within 1 participant)
1	Research that collects qualitative data, surveys, non-experimental studies: -No control/comparison group -Pre and post data collected -For single N designs there is less than 3 occasions where experimental effect is shown

Note. Criteria rationale based on "Typology of evidence" recommendations for research best suited to studying the effectiveness of interventions (Petticrew and Roberts, 2003).

Table B6

Weight of Evidence C (WoE C) Criteria

Criteria	WoE rating and descriptor		Rationale
A) Implementation of intervention	3	The intervention is implemented over a period of at least 8 weeks and is delivered in a setting under experimenter control by an individual who has undergone training	Good practice guidelines recommend that Mindfulness is carried out competently by trainers who have had professional training (UK Mindfulness Trainers Network, 2010). Studies that take place within settings with high internal validity will have more rigour in assessing the effectiveness of the intervention. Although the duration if mindfulness-based approaches required to see an effect is not known, MBSR (Kabat Zinn, 1984) is the approach with the strongest evidence base. This is 8 weeks in length and there is not currently evidence within the literature to warrant shortening this (Carmody et al., 2009, De vibe et al., 2017).
	2	The intervention is implemented over a period of at least 8 weeks and delivered in a setting under experimenter control but the professional delivering the intervention is not trained or the description of expertise is missing	
	1	The intervention is implemented over a period less than 8 weeks by a trained or untrained professional in a setting with or without experimental control.	
B) Sample population	3	Participants live in the UK	Studies carried out in the UK or countries with similar cultural norms are more likely to contain participants experiencing similar types of life
	2	Participants live in a country with similar	

Criteria	WoE rating and descriptor	Rationale
	cultural norms to the UK	stressors. This is increases the generalisability of findings.
	1 Participants live in a country that does not have similar cultural norms to the UK	

Note. A and B ratings were averaged to provide WoE C.

Table B7

Summary of Weight of Evidence C (WoE C) Ratings

Study	Intervention implementation	Sample population	WoE C
Gershy et al. (2017)	1	1	1
Behbahani et al. (2018)	2	1	1.5
Dehkordian et al. (2017)	2	1	1.5
Anderson & Guthery (2015)	1	2	1.5
Singh et al. (2010)	3	2	2.5

Appendix C –Mapping the field

Study	Participants	Design	Intervention	Measures	Outcomes	Country
Anderson & Guthery (2015)	N=7 (mothers of children presenting with ADHD symptomology, all allocated to experimental group)	Single group experimental design: pre/post test	Everyday Blessings: The Inner Work of Mindful Parenting (Kabat Zinn & Kabat Zinn, 1997). Parents were asked to read the book across 8 weeks at their own pace	Parenting Stress Index-short form (PSI-SF)	A reduction for the difficult child subscale was reported but this was not reach statistical significance	USA
Behbahani et al. (2018)	N=56 (parents of children with a diagnosis of ADHD, control group =30, experimental group =26)	Randomised Controlled Trial	8 face to face weekly sessions of Mindful parenting training based on a manual (Bögels and Kathleen	Parenting Stress Index–Short form (PSI–SF)	Significant reduction reported for difficult child subscale that was maintained at two month follow up	Iran

Study	Participants	Design	Intervention	Measures	Outcomes	Country
			Restifo, 2014).			
Dehkordian et al. (2017)	N=32 (parents of children with a diagnosis of ADHD, control group = 15, experimental group = 17)	Randomised Controlled Trial	8 face to face weekly sessions of Mindful parenting training based on a manual (Bögels and Kathleen Restifo, 2014)	Pediatric Quality of Life Inventory (PedsQL)	Significant improvement reported for children's 'quality of life' between mindful parenting and control group	Iran
Singh et al. (2010)	N=2 (mothers of children with a diagnosis of ADHD, both allocated to experimental group	Multiple baseline across participants design	12 sessions of face to face parental mindfulness, exact intervention not specified but adapted from protocols used in earlier studies by same authors	Parental collection of data (number of requests made and child compliance rates) for 4 hours each day. Length of intervention varied between the two children i.e longer baselines	Child compliance increased	USA

Study	Participants	Design	Intervention	Measures	Outcomes	Country
Gershy et al. (2017)	N=38 (parents of children with ADHD and behavioural difficulties, control group =19, experimental group =19)	Randomised Controlled Trial	Supplemented parent training in non-violent resistance with a 90 minute mindfulness session for parents	Externalizing scale of the Child Behavior Checklist (CBCL, Achenbach, 1991).	No significant differences reported in child externalising symptoms (significant across both experimental and control group).	Israel

Appendix D

Examples of coding protocols

Coding protocol: Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C, & Innocenti, M. (2004). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children, 71,* 149-164.

Study: Behbahani et al. (2018)

Essential Quality Indicators

Quality indicators for describing participants

Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?
☒ Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Was sufficient information given characterizing the interventionists or teachers provided? Did it indicate whether they were comparable across conditions?
☐ Yes
☒ No
☐ N/A
☐ Unknown/Unable to Code

Quality indicators for implementation of the Intervention and Description of Comparison Conditions

Was the intervention clearly described and specified?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Was the fidelity of implementation described and assessed?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Was the nature of services provided in comparison conditions described?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Quality indicators for outcome Measures
Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Were outcomes for capturing the intervention's effect measured at the appropriate times?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Quality indicators for data Analysis
Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?
☒Yes
☐ No
☐ N/A
☐ Unknown/Unable to Code

Did the research report include not only inferential statistics but also effect size calculations?

☐ Yes

☒No

☐ N/A

☐ Unknown/Unable to Code

Desirable Quality Indicators

Was data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?

☐ Yes

☒ No

☐ N/A

☐ Unknown/Unable to Code

Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?

☒ Yes

☐ No

☐ N/A

☐ Unknown/Unable to Code

Were outcomes for capturing the intervention's effect measured beyond an immediate post-test?

☒ Yes

☐No

☐ N/A

☐ Unknown/Unable to Code

Was evidence of the criterion-related validity and construct validity of the measures provided?

☐Yes

☒ No

☐ N/A

☐ Unknown/Unable to Code

Did the research team assess not only surface features of fidelity implementation (e.g. number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine quality of implementation?

☐Yes

☒ No

☐ N/A

☐ Unknown/Unable to Code

Was any documentation of the nature of instruction or series provided in comparison conditions?

☐ Yes

☒No

☐ N/A

☐ Unknown/Unable to Code

Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?

☐ Yes

☒No

☐ N/A

☐ Unknown/Unable to Code

Were results presented in a clear, coherent fashion?

☒ Yes

☐ No

☐ N/A

☐ Unknown/Unable to Code

Overall Rating of Evidence: ☐3☐ 2 ☒1 ☐ 0

Coding Protocol: Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, A., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Council for Exceptional Children,* 2, 165–179.

Study: Singh et al. (2010).

Description of participants and setting

Participants are described with sufficient detail to allow others to select individuals with similar characteristics; (e.g., age, gender, disability, diagnosis).
☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

The process for selecting participants is described with operational precision.
☐Yes
☒No
☐N/A
☐Unknown/Unable to Code

Critical features of the physical setting are described with sufficient precision to allow replication.
☐Yes
☒ No
☐N/A
☐Unknown/Unable to Code

Overall Rating of Evidence: 1

Dependent Variable

Dependent variables are described with operational precision.
☒ Yes
☐No
☐N/A
☐Unknown/Unable to Code

Each dependent variable is measured with a procedure that generates a quantifiable index.
☒Yes
☐No

☐**N/A**
☐**Unknown/Unable to Code**

Measurement of the dependent variable is valid and described with replicable precision.
☒**Yes**
☐**No**
☐**N/A**
☐**Unknown/Unable to Code**

Dependent variables are measured repeatedly over time.
☒**Yes**
☐**No**
☐**N/A**
☐**Unknown/Unable to Code**

Data are collected on the reliability or inter-observer agreement associated with each dependent variable, and IOA levels meet minimal standards
☒**Yes**
☐**No**
☐**N/A**
☐**Unknown/Unable to Code**

Overall Rating of Evidence: 3

Independent Variable

Independent variable is described with replicable precision.
☒**Yes**
☐**No**
☐**N/A**
☐**Unknown/Unable to Code**

Independent variable is systematically manipulated and under the control of the experimenter.
☒ **Yes**
☐**No**
☐**N/A**
☐**Unknown/Unable to Code**

Overt measurement of the fidelity of implementation for the independent variable is highly desirable.
☒**Yes**
☐ **No**
☐**N/A**
☐**Unknown/Unable to Code**

Overall Rating of Evidence: 3

Baseline

The majority of single-subject research studies will include a baseline phase that provides repeated measurement of a dependent variable and establishes a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Baseline conditions are described with replicable precision.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Overall Rating of Evidence: 3

Experimental Control/internal Validity

The design provides at least three demonstrations of experimental effect at three different points in time.

☐Yes
☒No
☐N/A
☐Unknown/Unable to Code

The design controls for common threats to internal validity (e.g., permits elimination of rival hypotheses).

☐Yes
☒No
☐N/A
☐Unknown

The results document a pattern that demonstrates experimental control.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Overall Rating of Evidence: 1

External Validity

Experimental effects are replicated across participants, settings, or materials to establish external validity.

☒Yes
☐ No
☐N/A
☐Unknown/Unable to Code

Overall Rating of Evidence: 3

Social Validity

The dependent variable is socially important.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

The magnitude of change in the dependent variable resulting from the intervention is socially important.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Implementation of the independent variable is practical and cost effective

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Social validity is enhanced by implementation of the independent variable over extended time periods, by typical intervention agents, in typical physical and social contexts.

☒Yes
☐No
☐N/A
☐Unknown/Unable to Code

Overall Rating of Evidence: 3

Average WoE A across the 7 judgement areas: 1 3 3 3 1 3 3
Sum of X / N = 17 / 7 = 2.4
X = individual quality rating for each judgement area
N = number of judgement areas