

School-based mindfulness programmes

Are they effective or developmentally inappropriate?

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Abstract

The effect of anxiety on children is substantial and its impact can lead to detrimental consequences. Mindfulness-based interventions are effective in working with anxiety because they focus on self-awareness of both mind and physiology, and pay attention to the present moment rather than to ruminations (Costello & Lawler, 2014). Internationally, mindfulness-based programmes are becoming increasingly popular among adult populations, both as clinical interventions for depression and anxiety disorders, and as education and prevention tools. Initial research in the field suggests that mindfulness may be an effective tool when working with children. This systematic review analyses studies of national and international mindfulness-based school programmes for children aged from 5 to 12 who are experiencing anxiety. Twelve studies met the criteria for inclusion in this review. Five major themes are identified and discussed: the differing types of anxiety featured in the studies and how each was measured; the varying nature and outcome of the mindfulness-based interventions used in the studies; variability in support for mindfulness-based interventions; the developmental appropriateness of mindfulness for children; and the implications of conducting research in school settings. Limitations of the studies, along with recommendations for future research, are also outlined.

Keywords: mindfulness, children, school, anxiety, wellbeing

Over the past 20 years there has been an increase in mindfulness therapeutic programmes in clinical practice and in schools (Wilson, 2014). However, while there is reasonably strong evidence to support the beneficial impact of mindfulness on adults, research with children is not as extensive or thorough (Frank, Jennings, & Greenberg, 2013; Harrington, 2015).

What is known is that, among school-aged children, anxiety is one of the most common psychological disorders (Neil & Christensen, 2009). In addition,

roughly half of all children with anxiety disorders have further diagnoses such as depression, and are more vulnerable to academic, social, and substance abuse problems (Greco & Hayes, 2008). Some researchers have noted a link between ruminations and anxiety and recommend interventions like mindfulness that foster an observational stance toward anxious cogitating mind patterns in order to help individuals gain some distance from them (Costello & Lawler, 2014). In addition, mindfulness interventions for children are reported to encourage children to acknowledge and accept their own feelings, which in turn can reduce emotional reactivity and ruminations (Coffman, Dimidjian, & Baer, 2006). Literature also suggests that because human beings have a limited capacity for information processing, by bringing all of one's energy to the present moment through mindfulness interventions, less attention is then given to anxiety (Semple, 2005; Wells, 2002).

Given that they often are the doorway to a broader range of mental health services, school-based wellbeing programmes are widely advocated for children, particularly those from disadvantaged backgrounds (Butler, 2015; Sawyer, Arney, Clark, Graetz, & Kosky, 2008). Literature suggests that there are several reasons for this. For example, offering school-based mindfulness intervention programmes not only provides key wellbeing benefits for students, but it can overcome some of the more significant barriers to accessing therapeutic interventions such as time, cost, and stigmatisation (Barrett & Pahl, 2006; Sawyer et al., 2008; Semple, Reid, & Miller, 2005).

While some literature reports the benefits of school-based interventions such as mindfulness and general wellbeing programmes, there are few studies into mindfulness-based intervention programmes for children aged between 5 and 12 years. Of interest to this particular review is the suitability of mindfulness as an intervention for anxiety for this age group. In particular, this study is interested in whether as an intervention it is developmentally appropriate (Arch & Ayers, 2013; Costello & Lawler, 2014; Neil & Christensen, 2009). The following systematic review, therefore, discusses literature focused on the impact of mindfulness-based programmes in schools for children aged 5 to 12 who are experiencing anxiety. It highlights the complexity involved in defining and measuring anxiety, and the need for robust studies that might determine if classroom-based mindfulness interventions are appropriate for this group. The studies captured here are taken

from international and Aotearoa New Zealand sources.

Method

Research question

The primary question directing the search and this systematic review is: Are mindfulness-based programmes in schools effective as an intervention for children aged 5 to 12 who are experiencing anxiety?

Search process

At the centre of a successful systematic review is a logical and systematic search strategy (Dickson, Cherry, & Boland, 2014). Specifically, the search must be balanced between the aim to find all evidence and being sensitive when determining which is most relevant.

A thorough search for research literature was conducted using the following databases: ERIC, PsycINFO, Scopus, Web of Knowledge, and Massey University's Discover search engine. A search was also conducted on Google Scholar and a selection of relevant peer-reviewed journals, which included: *Advances in School Mental Health Promotion*; *International Journal of School & Educational Psychology*; *Journal of Child and Adolescent Counseling*; *Journal of Child, Infant & Adolescent Psychotherapy*; *Mindfulness*; *New Zealand Journal of Counselling*; and *The Journal of Clinical Mindfulness & Meditation*.

The search terms used were *anxiety* or *anxious* or *anx**; *stressor* or *stressed* or *stress**; *wellbeing*; *children* or *child*; *youth*; *school*; *mindfulness* or *mindful**. In addition, the reference lists of all the studies that met the inclusion criteria were also searched for further relevant studies.

Inclusion and exclusion criteria and definitions

Mindfulness-based therapies are considered effective in reducing anxiety symptoms in adults, however research into the feasibility and effectiveness of mindfulness as an approach for anxiety in children is just beginning (Baer, 2003; Semple, Lee, Rose, & Miller, 2010). As a result of this paucity of available research, this review's inclusion criteria identified studies that produced quantitative, qualitative, and mixed-method data. These were studies that had researched the association between symptoms of anxiety in 5- to 12-year-olds in educational settings and the implementation of a mindfulness-based intervention. Dates of publication

were not one of the inclusion criteria, but it is significant that all the studies here were published after 2000. This confirms that as a field of research this is both contemporary and emerging.

The exclusion criteria for this research were: studies that were non-school or non-group based; studies in a language other than English; and studies that focused on an age group other than 5 to 12 years old.

Anxiety in this systematic review is understood to encompass both anxiety disorders and symptoms of anxiety (i.e., fear or worry that is not unique to a disorder). This may include fears and beliefs that are self-reported. It also includes anxiety that may or may not be specific to events such as tests or to particular concerns such as abandonment, and includes anxious or avoidant behaviours (Percy, Creswell, Garner, O'Brien, & Murray, 2016). This systematic review also understands anxiety as encompassing *stress* (Costello & Lawler, 2014)—stress, in this instance, being defined as the natural flight or fight response that occurs when danger is perceived and is accompanied by feelings of distress and an inability to cope (Perry, Pollard, Blakley, Baker, & Vigilante, 1995).

School-based intervention in this review is defined by context, such as a learning establishment rather than in an individual counselling or clinical setting (Olson, 2014).

Mindfulness intervention is defined as a learned skill based on paying attention non-judgementally to the present moment in order to enhance self-management of one's attention, curiosity, and acceptance (Baer, 2003; Bishop, 2004; Kabat-Zinn, 1994). In this review, mindfulness-based interventions include, but are not limited to: Mindfulness-Based Cognitive Therapy for Children (MBCT-C); Mindfulness-Based Stress Reduction for Children (MBSR-C); Pause, Smile, Breathe (Mindful Aotearoa); and bespoke combinations of mindfulness interventions (Bernay, Graham, Devcich, Rix, & Rubie-Davies, 2016; Costello & Lawler, 2014; Semple, 2005).

Quality assessment of studies

To avoid misleading conclusions, from biases either in the research studies themselves or in our review process, this systematic review incorporates quality assessment methods (Egger & Sterne, 2003; Greenhalgh & Brown, 2014). Each study has been categorised according to the levels of robustness of evidence on the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). This pyramid has levels

of evidence ranging from 1 to 7, with level 1 deemed to provide the most robust level of evidence (such as, systematic reviews and meta-analyses of randomised controlled trials), and level 7 being the least robust (like expert opinion) (Melnyk & Fineout-Overholt, 2011). However, Melnyk Pyramid categories do not allow for differences across the study types, and some of the studies within the randomised controlled trial category were more rigorous than others.

Another quality assessment tool used in this study was an adaptation of the Evaluative Tool for Mixed Method Studies specifically developed to evaluate quantitative, qualitative, and mixed-method studies as part of systematic reviews in the field of social care (Long, Godfrey, Randall, Brettle, & Grant, 2005). For the purposes of this review, this tool was shortened to exclude questions not relevant to studies outside the field of health, or information that is already provided in the data extraction table. This tool gathers information in seven categories: evaluative overview; study and context; ethics; group comparability; data collection and analysis; policy and practice implications; and references. Thomas and Harden (2008) recommend that there are three main quality issues to ensure when evaluating studies. This tool addresses all three. The first is whether there is a reporting of the study's aims, context, methods, and findings; the second, whether it addresses the strategies used in the study to assess the validity of the data collection and findings; and finally, the appropriateness of the method of study in terms of generalisability of results.

Literature analysis and synthesis

To answer our research question, the findings of the 12 selected studies in this review were collated through a process of thematic analysis (Pope & Mays, 2006), which employs a narrative and a theme-based approach. Accounting for the variety of research methodologies in these studies, it is considered the most appropriate way to assess them (Snilstveit, Oliver, & Votjkova, 2012; Thomas, Harden, & Newman, 2012). However, a weakness of thematic analysis can be a lack of transparency and clarity (Dixon-Woods, Agarwal, Young, Sutton, & Jones, 2005), therefore thematic summaries were also used. Thematic summaries involve a description of the studies and their prevalent themes. Thematic synthesis, also used here, entails coding of text to identify the main themes (Snilstveit et al., 2012).

Combining qualitative, quantitative, and mixed-method studies as part of a systematic review is complex and contentious. It has been argued that qualitative

research, because it is specific to a context, group, and time in the lives of participants, is difficult to generalise (Atkins & Smith, 2012; Thomas & Harden, 2008). Simply, as Thomas and Harden (2008) suggest, it is far more difficult to know what counts as findings or data in qualitative studies compared with randomised controlled trials.

As recommended by Thomas et al. (2012), the thematic summaries in this review have been identified through an iterative review process, with a view to addressing the themes that are relevant for the review question. Due to the small size of this research, tools such as NVivo and peer review (Snilstveit et al., 2012; Thomas et al., 2012) have not been utilised. Rather, hand coding was employed.

Results

Twelve studies were identified as fitting the inclusion criteria for this systematic literature review: seven randomised control trials; one mixed-method study; an open trial; an experimental waitlist-controlled design; an action research design; and a cohort study. They are all group design studies but there is a mixture of quantitative, qualitative, and mixed-method data collection. Given that most of the studies measured the impact of mindfulness on more than just anxiety, only the measures relating to the following terms were recorded: anxiety, fear, worry, stress, wellbeing, rumination, and intrusive thoughts.

From the thematic synthesis five themes emerged: how anxiety was measured, and differing types of anxiety featured in the studies; the varying nature and outcome of the mindfulness interventions among the studies; variability in support for mindfulness interventions; developmental appropriateness of mindfulness for children; and the implications of conducting research in the school setting. These themes provide the foundation to answer the review question, and to outline the limitations in the studies as a whole.

Theme one: How anxiety was measured, and the differing types of anxiety featured in the studies

This systematic review takes a broad definition of childhood anxiety that encompasses studies that measure wellbeing, fear, test anxiety, worry, stress, and self-esteem. The measures of anxiety in the studies within this review are also broad. While some use self-, parent-, or peer-reporting to assess anxiety, others use tailor-made assessment tools such as the Responses to Stress Questionnaire (Mendelson

et al., 2010) or the Modified Spielberger State-Trait Anxiety Inventory—Child Version (Britton et al., 2014). Employing a broad definition and reviewing diverse measures makes it difficult to assess the impact of mindfulness-based interventions on anxiety compared with investigating the impact on a specific anxiety disorder. School-based interventions have generally tended to examine and address the needs of the collective rather than a single clinical group, which adds to this difficulty (Frank et al., 2013; Neil & Christensen, 2009).

In addition, Semple (2005) notes that results regarding the impact of a mindfulness intervention on anxiety symptoms can be biased when working with children who do not have clinically elevated levels of anxiety. In Semple's (2005) trial, for example, while there was a reported reduction in anxiety symptoms in the active group, it was not significantly different to that of the control group. Moreover, some studies state that children may underreport anxiety in order to get favourable evaluations or to avoid treatment (Glennon & Weisz, 1978; Semple et al., 2005).

Theme two: The varying nature and outcomes of mindfulness-based interventions among the studies

The 12 studies used in this review all employed research designs that accommodated mindfulness-based interventions for groups rather than individual participants. These mindfulness-based interventions were also all modified from mindfulness-based interventions previously used with adults and were conducted by a range of adults, some known to the participants, and some who were not. All the mindfulness-based interventions in these studies incorporated more than one method, such as breath work, movement, body scan, and awareness of thoughts and feelings. The duration of the studies ranged from 6 to 12 weeks, and from 3 minutes of mindfulness intervention daily to 45 minutes per week. Three of the studies included a follow-up, one at seven weeks post-test, and two at three months post-test. The number of participants in the studies ranged from 5 to 194.

Regions

Eight of the 12 studies were conducted in the United States of America and the remaining studies were conducted in Amsterdam, Australia, Ireland, and New Zealand. Eleven of the 12 studies were conducted in primary school settings, and one in a remedial-reading summer programme.

Variation in outcomes of the mindfulness interventions

As recommended by Gough and Thomas (2012) the results and outcome ratings for the studies were synthesised and analysed, and the relevance of these studies to the review question was assessed. In conjunction with the quality assessments, this provided information to help determine which studies were the most rigorous and relevant to this research project.

Studies reporting good outcomes

Five studies were considered to have good outcomes. Anxiety levels were statistically recorded as significantly decreasing when reported by student participants, self-report, or by parent reports (Bernay et al., 2016; Britton et al., 2014; Mendelson et al., 2010; Napoli, Krech, & Holley, 2005; van de Weijer-Bergsma, Langenberg, Brandsma, Oort, & Bogels, 2014).

Mendelson et al. (2010) reported significant decreases in rumination, intrusive thoughts, and emotional arousal, which are all indicators of anxious behaviour. Using their Responses to Stress Questionnaire to assess involuntary reactions to stress at pre- and post-intervention, the authors found that the mindfulness and yoga intervention examined in their study was effective in reducing some involuntary participant responses to social stress (Mendelson et al., 2010).

In van de Weijer-Bergsma et al.'s (2014) study, anxiety symptom reduction was included as one of many measures of the study. Measurements were taken seven weeks prior to the intervention to acquire a baseline, pre-test, post-test, and a seven-week follow-up. From pre-test to follow-up there was a significant decrease in rumination and analysis of emotions. In addition, parent-reported anxiety symptoms also decreased significantly.

In Bernay et al.'s (2016) mixed-method study, wellbeing and mindfulness were measured at baseline immediately following the intervention and at a three-month follow-up. An increase in wellbeing was statistically significant post-intervention. The qualitative assessment tools, including journals, interviews, and discussion, showed that the students believed the mindfulness intervention improved their wellbeing and that they spent less time worrying. Whether this was sustained, however, is uncertain as in accompanying quantitative measures wellbeing was recorded as declining to baseline levels after three months.

In their mindfulness-training research, Napoli et al. (2005) showed a statistically significant difference between experimental and control groups regarding a reduction in test anxiety and a decrease in selective attention levels among children in the classroom.

Britton et al.'s (2014) randomised pilot trial provided interesting results. Both the intervention and control groups' scores decreased significantly on clinical scales, but the two groups did not differ from each other in the extent of their improvements. From this the authors conclude that "mindfulness training may yield both unique and non-specific benefits that are shared by other novel activities" (p. 274). The self-reporting measures also supported these benefits: 92% of participants reported a perceived benefit in meditation practices; increase in ability to focus; and decrease in anxiety, while 82% reported feeling more focused and 88% reported feeling more relaxed, with a decrease in worry, stress, and anxiety.

Studies reporting moderate outcomes

Three studies were deemed to have moderate outcomes with mindfulness interventions. This included studies that showed results in lower anxiety scores for one gender only, or similar results across both the mindfulness and active control intervention group (Butler, 2015; Costello & Lawler, 2014; Parker, Kupersmidt, Mathis, Scull, & Sims, 2013).

Costello and Lawler's (2014) exploratory study with school children from lower socioeconomic backgrounds shows that while there was a significant decline in the students' perceived levels of stress, they continued to be classified within the high stress level category. The researchers hypothesise that this may be attributable to the underlying stress of living in low socioeconomic conditions, and comment that their results are therefore difficult to generalise. In the qualitative analysis, there were two different responses among students. Some students reported that they were more able to detach themselves from their stress with mindfulness skills, while others noted feeling even more stressed and upset after the mindfulness intervention. Likewise, some students reported feeling able to ruminate less, while others reported no decline in their persistent ruminations.

In their work with primary school students, Parker et al. (2013) described gender as playing a role in explaining unexpected variances within their results.

There was a significant reduction in anxiety post-test for girls in the intervention group compared with the control group, but the researchers included no comment about this. Nonetheless, students reported that they enjoyed the programme and learned to pause and be mindful in their daily lives.

In her thesis on mindfulness-based interventions for primary-aged school children, Butler (2015) focuses on anxiety and rumination as a key part of her study. Self- and teacher-reported anxiety scores from pre-test to post-test show significantly greater improvements for children in the mindfulness-based intervention and relaxation therapy groups compared to the children in the control group. They did not, however, show a statistically significant impact on the children's anxiety according to parent reporting. Parent ratings of anxiety reduced for all three groups but there was no significant improvement for those in the mindfulness group compared with other groups. Butler concludes from this that the mindfulness-based intervention is like a relaxation therapy programme, an effective intervention that she introduced for children with anxiety.

Studies reporting weak outcomes

Three studies were considered to have weak outcomes, with the results being either ambiguous or not included here because the measures were deemed inadequate (Reid & Miller, 2009; Schonert-Reichl, Oberle, Stewart Lawlor, Abbott, & Thomson, 2015; Semple, 2005). However, two of these were assessed as having a high relevance to this review due to their very specific focus on anxiety, while Reid and Miller (2009) was considered of low relevance.

Schonert-Reichl et al. (2015) used five measures to assess the impact of mindfulness in their trial with elementary school children. Two measured neuropsychological impact, including anxiety, with a salivary cortisol measure being used. Saliva was collected three times a day to examine the association between daily cortisol patterns and heightened nervous system activity. There were no significant differences between the intervention and control groups for cortisol secretion. This study reported ineffectiveness in their use of randomisation as there were significant differences between the two groups at baseline, thus improvements or declines could not be compared to useful baseline data. A similar difficulty was present in a study by Reid and Miller (2009). These authors state that because they had no control group in their action research design study, causation was

impossible to measure; however, their Rosenberg Self-Esteem Scale showed the group had a decrease of 4% in self-esteem from pre-test to post-test.

Semple (2005) reported that reductions in anxiety symptoms were indicated by some measures, though no significant group differences were found. From this they concluded that it was not possible to attribute reported reductions to training that used a Mindfulness Based Cognitive Therapy for Children (MBCT-C) intervention. Interestingly, although The Multidimensional Anxiety Scale for Children and the State-Trait Anxiety Inventory for Children were used by Semple (2005) and colleagues, the results from these measures were not reported because the children were experiencing little anxiety and the assessments were determined not to be age-appropriate for the study's five participants. The research concludes that mindfulness training might be effective for children with internalised anxiety problems.

Theme three: Variability in support for mindfulness interventions—are they all created and delivered equal?

Nine different types of mindfulness-based interventions were reported across the 12 studies in this systematic review. They ranged from a bespoke combination of mindfulness-based techniques to more well-known or researched interventions such as MBCT-C (Semple, 2005) and MindUP (Schonert-Reichl et al., 2015). There were 10 studies with multiple facilitators and two studies with a single facilitator across all groups. In 50% of the studies the facilitator was known to the students, and in 50% they were unknown. In some instances, the facilitators were also the research team and highly trained in the mindfulness-based intervention they administered (Bernay et al., 2016; Butler, 2015; Mendelson et al., 2010; Semple et al., 2010). While some studies measured the fidelity of the facilitators or teachers in adhering to the mindfulness-based intervention, others did not. Parker et al. (2013) observed each of the mindfulness facilitators during 75% of their activities and surveyed them throughout the study to ensure fidelity. This assessment concluded that the programme was delivered as intended, which was a significant element of its evaluation. The effectiveness of a programme that is not delivered with fidelity to the original theoretical model cannot be judged (Cappella, Massetti, & Yampolsky, 2009). Thus, it is possible that the students in these studies did not always receive the conditions prescribed by the research regimen.

In the studies reviewed, there is mixed research about the ideal facilitator to

lead a mindfulness-based intervention. While some studies argue that students may not be receptive to, or motivated by, an external mindfulness trainer, others advocate that a therapist or external trainer may be a better guide in self-discovery and more able to identify and accommodate trauma-related responses in the children (Britton et al., 2014; Greco & Hayes, 2008). Mendelson et al. (2010) argue that a greater involvement by teachers as facilitators opens up potential for the mindfulness-based intervention to be used more widely and regularly in the classroom. Some studies offer audio CDs for the facilitator to use if they prefer, and some offer optional homework that is not monitored. Given that the impact of these variables is not measured, it is unclear how or if these might impact on the results.

The ideal amount of a mindfulness-based intervention for children is not well understood (Greenberg & Harris, 2011). Across the studies in this review the mindfulness-based intervention ranged in duration from 3 to 60 minutes a day, from daily to fortnightly, and from 5 to 24 weeks in total. It is important to understand that the frequency and length of practice may affect the overall impact of mindfulness-based interventions (Huppert & Johnson, 2010). In fact, research indicates that repetition of mindfulness-based practice may be a critical factor in the extent to which neural activity is altered (Greenberg & Harris, 2011). Huppert and Johnson's (2010) study used a modified form of Mindfulness Based Stress Reduction with adolescents and showed evidence of improvement in wellbeing correlated with greater frequency in practice. This aligns with other research that suggests that being exposed to a limited duration and frequency of mindfulness may in fact increase awareness of anxiety and stress and precipitate further stress rather than providing the benefits of mindfulness (Hayes & Feldman, 2004; White, 2012).

Theme four: The developmental appropriateness of mindfulness interventions for children

Overall, the studies in this review lack an examination of what is happening developmentally for the age range of 5- to 12-year-olds, and therefore what is appropriate in terms of intervention and/or therapy. While it is beyond the scope of this project to address the diverse developmental theories and their merits, it is important to address some gaps and the potential implications of the research examined in this systematic review. While it was once considered appropriate to

extrapolate from adult counselling and therapy research to work with children, it is now clear that, in view of the diverse needs of children and the fact that they are embedded within the family context, their psychotherapeutic needs are similarly broad (Kazdin, 1993; Silk, Nath, Siegel, & Kendall, 2000). Moreover, there is a growing body of research in child psychotherapy which recommends a focus through the lens of developmental psychology to understand trauma exposure in relation to anxiety, rather than pathologising it (Adler-Tapia, 2012).

Therefore, across several studies in this review, researchers had modified mindfulness programmes for adults in order to make them suitable for children, the main modification being a reduction in the duration of the silent meditation portion. As noted above, except for Bernay et al. (2016), Butler (2015), and Semple (2005), the studies do not reference the many developmental needs (physical, cognitive, social, and emotional) of the groups of children that they are working with. While some groups of children studied are within a narrow age range, for example, Semple et al. (2005) worked solely with seven- and eight-year-olds, the range between students across studies was as large as four years. The mindfulness-based treatments for children, such as Acceptance and Commitment Therapy (ACT) (Greco & Hayes, 2008) and MBCT-C (Semple & Lee, 2008), recommend no greater than a two-year age range to maintain group cohesion and meet the diverse developmental needs of young people. Semple and Lee (2008) state that across the three-year age span that they work with in MBCT-C there are significant differences in children's physical, cognitive, social, and emotional development that must be catered for in small group programmes with careful regard to speech, interactions, structure, and guidance.

It could be argued, therefore, that the diverse developmental needs within the 5- to 12-year-old age range could have implications for data collection. For example, Semple et al. (2005) reported being unable to use the self-report measures from their students because it was only in the process of data collection that the researchers realised the students did not understand key terms such as "jittery and tense" (p. 385), rendering it difficult for them to draft a conclusion from their self-report for anxiety. Some studies (Mendelson et al., 2010; Schonert-Reichl et al., 2015) have sought to overcome the problem by reading the assessments to the children in order to ensure that they understand the questions. Some other studies did not evaluate the students' understanding during self-reporting, or peer reporting (Napoli et al., 2005; van de Weijer-Bergsma et al., 2014). According to

Britton et al. (2014), these differences in data collection methods could potentially impact on the results with this age group. Britton et al. also note that triangulating self-report measures from children with “objective neuropsychological measures” (p. 273) could improve the validity and generalisability of the results.

Piaget (1962), well known for his work in child development in the 1900s, has had an unprecedented impact on the study of a child’s acquisition and use of knowledge (Salkind, 2004). A brief explanation of some of Piaget’s widely acclaimed developmental theory may highlight the need for variations in delivering mindfulness to children. According to Piaget (1962) there are four overarching developmental stages from birth to adulthood. The age range in this project traverses two of Piaget’s developmental stages: preoperational (ages 2 to 7 years) and concrete operational (7 to 12 years) (Salkind, 2004). Piaget suggests that the concept of stages may be complex, as the stages are fluid and children are continually interpreting and filtering the world according to their own individual schemata (Adler-Tapia, 2012).

The preoperational stage is characterised by an acquisition of language and a foray into understanding cause and effect (Santrock, 2011). Piaget states that children still make inappropriate generalisations about what they attribute their feelings and experiences to in this stage (Salkind, 2004), which can potentially impact on the self-reporting methods used for data collection in these studies. Piaget’s concrete operational stage is characterised by an end of egocentrism and an ability to hold more than one thought at a time (Gruber & Voneche, 1977). This stage relies heavily on concrete experience, in which children are “unable to perform operations that are purely verbal without the benefit of previous experience” (Salkind, 2004, p. 254). This may also pose significant questions about the way young participants receive mindfulness intervention instructions.

As a well-known therapy for anxiety, Acceptance and Commitment Therapy (ACT) suggests three broad areas in which mindfulness-based programmes for children can be modified to cater for their developmental needs: attentional capacity, multisensory learning, and family involvement (Greco & Hayes, 2008). This therapeutic approach also clearly suggests that children need more individualised attention than adults. The emphasis of the ACT programme, therefore, is on class ratio, age range, creating emotional safety akin to that of a therapeutic relationship, and creating an atmosphere that is different to a standard

classroom environment (Greco & Hayes, 2008). MBCT-C (Semple & Lee, 2008) practice also suggests that mindfulness-based interventions with children might, in contrast to adult interventions, need to make room for children's undeveloped awareness of their cognitive processes. Semple and Lee (2008) state that because children are less able to describe their internal states with words, more concrete and interactive experiences are required, and that their facilitators must be adept at seeking to translate children's thoughts and emotions into words.

While mindfulness-based programmes in schools are not necessarily described as therapy for children, but rather as educative and preventative, they do touch on students' wellbeing in a way that requires careful ethical consideration and a developmental perspective to ensure the work is age-appropriate (Greenberg & Harris, 2011). Furthermore, some research indicates that caution needs to be exercised when introducing mindfulness school-wide, rather than at an individual level, as it may be contraindicated for certain young people with pre-existing mental health conditions (Arch & Ayers, 2013; Cordon, Brown, & Gibson, 2009; Costello & Lawler, 2014; Ma & Teasdale, 2004). Two students within Costello and Lawler's (2014) study reported feeling more anxious after the mindfulness-based intervention than before, reporting more negative feelings and an inability to stop thinking about the anxiety.

It seems important that mindfulness-based programmes in schools are aware of the fact that mindfulness is not a relaxation technique, but rather an intervention designed to bring awareness to one's internal state (Semple & Lee, 2008). This may mean, for example, that a child may re-experience trauma while in a mindful state and lack the skills and awareness to process these experiences (Chadwick & Gelbar, 2016; Costello & Lawler, 2014). Moreover, mindfulness-based programmes in schools may not allow time for developing expertise or to process what has surfaced (Chadwick & Gelbar, 2016). Therefore, in the interests of participant safety, it would be a useful precaution to enlist the support of a school counsellor with cohorts being studied and/or when using mindfulness interventions. Furthermore, wherever possible participants should be screened prior to involvement with a mindfulness-based intervention. Staying with a negative core view of self, and all the associated emotions, can potentially overwhelm and trigger a participant into avoidance and disengagement, the most serious forms of which are self-harm and suicide (Hayes & Feldman, 2004). It is therefore particularly important to

determine whether a participant has sufficient coping strategies to tolerate negative thought patterns or a negative self-view that may present in mindfulness (Hayes & Feldman, 2004).

Theme five: The implications of conducting research in a school setting

Several studies in this review note that within the school context it is difficult to conduct rigorous research under ideal scientific conditions (Bernay et al., 2016; Butler, 2015; Mendelson et al., 2010; Semple, 2005; van de Weijer-Bergsma et al., 2014). In addition, the current climate in education, certainly in the USA and arguably in New Zealand, calls for evidence-based research before adopting new programmes (Dinella, 2009). The school's setting, including its special character, culture, and philosophy, can also influence outcomes for students and staff and should be accounted for when designing a school-based study (LaRusso, Brown, Jones, & Aber, 2009). Britton et al. (2014) touch on this when they note that their results may be biased and not generalisable given that, in this instance, they were conducted in a Quaker school, a very specific school culture and context. Broadly, in research generalisation is difficult without access to larger sample sizes, such as a whole school (Bernay et al., 2016; van de Weijer-Bergsma et al., 2014).

In addition, this review highlighted the difficulty of involving a large enough number of schools in research to ensure that the sample is randomised (Bernay et al., 2016; Mendelson et al., 2010;). Van de Weijer-Bergsma et al. (2014) note, for example, that teachers often decide who may participate in a study and that there is often a selection bias that should be noted when working in schools.

Finally, while some studies in this review required only a short period of data collection each day (a few minutes of students journaling after a mindfulness session), others needed 60-90 minutes at pre-test, post-test and follow-up (Semple, 2005; Semple et al., 2005). Consequently, while it is understood that a comprehensive and triangulated approach yields the best evidence of the effect of an intervention, it is also important to consider the burden of multiple measurements on children in a school setting (Cappella et al., 2009; Ogles & Owens, 2004). Cappella et al. (2009) suggest creating a priority list to overcome the pressures on children of assessing multiple outcomes.

Limitations of reviewed studies and recommendations for future research

The 12 studies in this systematic review present a contradictory set of results for

the role that mindfulness-based programmes in schools play in relationship to childhood anxiety. While five studies show the impact of mindfulness as positive, with significant decreases in childhood anxiety, not all are equally relevant to this review, nor are they all robust studies. Similarly, four studies show weak or inconclusive results.

There are complicating factors. Researchers are unable to confidently correlate their results with the mindfulness-based intervention presented to participants. There are difficulties in creating scientifically sound research designs within the school setting. These include not being able to use randomisation to select a sample, a lack of measurement and assessment methods which are developmentally and time appropriate, and being sure of treatment fidelity with multiple mindfulness-based intervention facilitators that are sometimes employed across a geographical spread.

The differing definitions of anxiety, and methods for measuring anxiety, are a distinct limitation. A lack of consistent measures for assessment across the studies means the effect of the interventions on anxiety is not easily generalisable to all types of anxiety, such as fear, stress, or worry.

The lack of longitudinal studies in this review is a significant limitation. Three of the 12 studies employed a follow-up (one at seven weeks, two at three months). In all cases the results differed from immediately post-test, highlighting a need for further investigation into the longevity of the mindfulness-based intervention, the measurements used, and the impact of the amount and length of the programme on children and anxiety.

The near-absence of childhood developmental theory across these studies is also a limitation. In this regard, no studies gave this as a rationale for choosing mindfulness-based interventions over more established methods of working with childhood anxiety. In our view, a consideration of child development theory would add more credence to the studies.

Aotearoa New Zealand offers mindfulness interventions in schools and it is encouraging to see one piece of research from Aotearoa in this body of work (Bernay et al., 2016). This was a mixed-method study of 124 primary school students from three New Zealand schools. The aim of the study was to assess if children experienced improved wellbeing after an eight-week mindfulness programme. Results showed wellbeing increased significantly, however this did

return to baseline levels at a three-month follow-up, suggesting further research investigating the reasons for this would be relevant.

Future studies into the area of mindfulness-based programmes in schools need to focus on robust studies, adequate follow-up periods and testing, with further exploration of developmental best practice for this age group, and an understanding of the impact of different durations and frequency of intervention on the students. Furthermore, for Aotearoa to evaluate the effectiveness of mindfulness-based programmes in our schools, more research that accounted for the local context would assist in interpreting data.

Limitations of this review

This is a relatively new area of published research, with all the studies reviewed having been undertaken over the past 14 years, and six of these being done in the last five years. Accordingly, this systematic review is only a snapshot at a specific point in time. Furthermore, while all care was taken in the search process, one can never be sure that valuable literature was not overlooked.

Given there are only two reviewers, the review is likely to be impacted by bias, especially in the synthesis section where the themes emerging may have differed if the studies had been reviewed more widely.

The inclusion of qualitative, quantitative, and mixed-method studies is relatively new, and it was difficult with a project of this limited scope to preserve the integrity of the study types. This may also have an impact on the review's findings. In a longer systematic review, it might have been more reliable to undertake separate systematic reviews according to each research methodology, and then bring these together as a synthesis (Cherry, Perkins, Dickson, & Boland, 2014).

It is suggested that a longitudinal study within an Aotearoa New Zealand school, or schools, would add significantly to the research in this field. Specifically, the study might include robust definitions of anxiety, measures of participant mindfulness and anxiety levels, and a clear approach to assessing treatment fidelity. The study would also need to be embedded in the educational context and include an exploration of developmental best practice for the use of therapeutic interventions for this age group.

Conclusion

Across the studies, and despite limitations, it can be concluded that mindfulness-based programmes in schools can be useful for anxiety for some children aged 5 to 12. Administering interventions within the school setting can be an effective way to reach a broad population that may not otherwise receive the education regarding anxiety, anxiety prevention, and coping and management skills it may need.

However, caution is needed when applying mindfulness-based programmes as an intervention for all children, given that results show an increase in rumination and anxiety in some cases. Attention must be given to ensuring the mindfulness techniques and reporting measures are developmentally appropriate to meet children's ages and stages, including the appropriate amount and frequency of mindfulness practice. Furthermore, the wide range of skill level and training of mindfulness trainers may impact on the efficacy of mindfulness programmes and, most importantly, child wellbeing.

Despite the lack of longitudinal data and some weak research designs, the results of this research are promising. This finding is in line with other reviews of research on mindfulness in schools' programmes (Frank et al., 2013). Britton et al. (2014) state that the implementation of mindfulness-based programmes within schools has already begun to outpace the research that supports the efficacy of these programmes. This review demonstrates that while some rigorous high-quality research is emerging, there is a need for more robust longitudinal research. Furthermore, future research needs to incorporate an understanding of the differential effects of the amount of mindfulness and how this may vary based on the developmental needs of its participants.

Finally, given what we don't know, there is a need to be cautious around participant safety, particularly when working with children, to whom we owe the highest possible ethical care and consideration.

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The preparation of this article was overshadowed by Karen Frewin's death in June 2019. Karen was my supervisor in this work, which was initially completed in partial fulfilment of my Master of Counselling Studies. I admired Karen for her dedication, her immense skill, her keen intellect and, above all, her enormous heart. This work is dedicated to Karen's memory.

Lisa Chaplow
Whanganui
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