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Mindfulness-Based Approaches For Young People With Autism Spectrum Disorder And Their Caregivers: Do These Approaches Hold Benefits For Teachers?

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Abstract: Parents and teachers who care for and educate young people with Autism Spectrum Disorder (ASD) face unique challenges associated with their roles. In this review we investigated the efficacy of mindfulness-based interventions in reducing stress and increasing positive behaviours in young people with ASD and their caregivers: parents and teachers. Nine studies on the topic were located, showing that the research base in this field is in the infancy stage. Each study illuminated the transformational change caregivers and young people experience after practicing mindfulness training (MT). The results also highlighted the interdependent relationship between the caregivers' level of mindfulness and their child's pro-social behaviours. We recommend that future researchers focus on understanding mindfulness as a relational practice as well as how the practice can support teachers who care for and educate students with ASD.

Keywords: Mindfulness, meditation, Autism Spectrum Disorder, interventions

Introduction

Autism Spectrum Disorder (ASD) is a life-long neurological disorder. It is characterised and diagnosed by differences in social communication and atypical patterns of behaviour. Children with ASD might play alone and withdraw from social situations; have difficulty understanding other people's perspectives or feelings; have particular interests or attachments; and prefer routine and structure that might be considered restricted and repetitive to others (autismpectrum.org.au). These atypical patterns of behaviour can result in children with ASD feeling frustrated easily, resulting in challenging behaviours such as temper tantrums (Bluth, Roberson, Billen, & Sams, 2013). The expression of these characteristics occurs on a spectrum, meaning there is a wide degree of variation in how it affects individuals as well as the severity of symptoms (Bluth et al., 2013). For example, where one child with ASD may be highly verbal, he or she may not socialise well with others. Likewise, where one child with ASD might be overly disturbed by sensory stimuli, another child with ASD would underreact. According to the Australia Bureau of Statistics

(ABS), approximately one in 100 people in Australia have ASD, males being four times more likely to be diagnosed with ASD than females (ABS, 2012).

Parents and teachers of young people with ASD experience unique challenges in caregiving (Benn, Roeser, Arel, & Akiva, 2012). Stress and anxiety associated with their roles has been shown to “impact upon parents’ and special educators’ health and well-being, as well as the quality of their parenting and teaching” (Benn et al., 2012, p. 1476). The complexity of ASD symptoms can hinder and frustrate the development of sibling and parent-child relationships at home and peer and teacher-child relationships in school settings (Sequeira & Ahmed, 2012, p. 2). Often, young people with ASD have difficulty with cognitive processing (Cachia, Anderson, & Moore, 2015) and can feel overwhelmed when confronted with confusing situations (Russell, 2011). As a result, they may become frustrated easily and respond with angry outbursts or with physical aggression (Singh et al., 2011). For a parent, this can mean that going from one activity to another triggers an emotional meltdown in their child with ASD; this can be distressing and stressful (Russell, 2011). For a teacher, school excursions, recess or other occasions where routines are disrupted may cause distress in a student with ASD. A recent Canadian study, investigating the challenges teachers encountered providing for children with ASD in mainstream classrooms, found that teachers lacked adequate strategies to appropriately manage a student with ASD when a behavioural outburst occurs (Lindsay, Proulx, Thomson, & Scott, 2013). One teacher participant interviewed reported: “There are days where you might have a student with autism who has a meltdown and you can’t deal with it right then and there ... You just can’t always work with just one child” (Lindsay et al., 2013, p. 355).

In addition to these challenging behaviours, basic behaviours that mediate social interactions such as eye contact, facial expressions and gestures are not easily “read” by young people with ASD. For teachers, this may make establishing rapport with a student with ASD challenging as well as including them as a full participant in classroom lessons and amongst their peers (Lindsay et al., 2013). While the emotional impact of ASD on families is acknowledged, research into the various impacts for teachers who work to provide appropriate educational opportunities and meet the specific needs of students with ASD has received scant attention. In this paper, we provide a review of studies involving mindfulness-based interventions as an approach to enhancing the emotional wellbeing of young people with ASD, their parents and their teachers.

Early research suggests that mindfulness-based programs have the potential to support young people with ASD as well as the adults who care for them (Singh et al., 2011). Cultivating mindful qualities, such as emotional awareness, non-judgemental acceptance, equanimity, and compassion (including self-compassion) (Albrecht, 2015; Shapiro & Carlson, 2009) may prove promising in improving executive functioning and reducing aggressive and problem behaviour in young people with ASD. A study by Singh et al. (2011) suggests that adolescents with ASD can successfully and effectively learn to use mindfulness practices to self-regulate stress responses and enhance their wellbeing. Similarly, mindfulness interventions with parents can reduce stress and anxiety and enhance parent-child interactions (de Bruin, Blom, Smit, van Steensel, & Bögels, 2014; Hwang, Kearney, Klieve, Lang, & Roberts, 2015; Singh et al., 2007). Currently, only one study by Benn et al. (2012) considered the efficacy of mindfulness as a tool for teachers who work with students with ASD. Despite this gap, it is not difficult to envision how the components of mindfulness emotional awareness, self-regulation and non-judgemental acceptance – including compassion (of the child and the caregiver-self) can benefit teachers who work with young people with ASD.

In this review, the following research questions are addressed:

1. What is the efficacy of current mindfulness-based interventions for young people with ASD and their parents?

2. What are the characteristics of the various mindfulness-based interventions? How is the intervention structured, and what are the expectations of the participants involved?
3. What are the measures used?
4. What interdependent effects are evident as a result of mindfulness training?
5. How might a mindfulness practice benefit teachers who work with students with ASD?

Finally, suggestions are made to stimulate future research in the field of ASD and education.

Mindfulness Defined

Mindfulness practices are generally inspired by principles and practices, commonly associated with Buddhist and other spiritual traditions including Hinduism, Islam, Taoism and Judaism (Albrecht, Albrecht, & Cohen, 2012; Stahl & Goldstein, 2010). In academic literature, mindfulness is often used interchangeably in three main ways (Albrecht et al., 2012). First, it is used to describe a state of mind, second, a trait or disposition and lastly, as a practice or method for cultivating either a mindfulness state or more lasting trait (Grossman, 2008). Kabat-Zinn (Kabat-Zinn, 1990, 2003, 2005) founder of one of the most popular and researched program, Mindfulness-based Stress Reduction (MBSR), conceptualises mindfulness as a state where awareness emerges through paying attention on purpose to the present moment, not with judgment, but with curiosity and acceptance. MBSR is a program aimed at cultivating a mindful state (Albrecht, 2015). Of course, like other mental states, such as excitement and fear, mindful states are momentary. Other mindfulness researchers conceive of mindfulness as a trait or disposition, that is, they propose that humans have the inherent capacity to be mindful, and some people are naturally more mindful than others (Albrecht et al., 2012; Shapiro, Carlson, Astin, & Freedman, 2006; Wallace, 2006). Lastly, the term mindfulness is also used in the literature to describe two broad methods or practices that cultivate mindfulness. The first involves the withdrawing from daily activity to intentionally engage with formal meditation techniques. The second involves purposefully integrating what is learned in the formal practice into daily activity, such as washing the dishes, eating or brushing your teeth with mindful attention. Mindfulness-based programs, such as MBSR, explicitly teach both formal and informal mindfulness practices. Where the literature is in agreement is the idea that a dedicated and regular mindfulness practice will develop a person's capacity to go beyond fleeting states of mindfulness to experiencing more enduring traits of mindfulness (Anderson, Levinson, Barker, & Kiewra, 1999, p. 8; Wallace, 2006, p. 4).

Mindfulness Programs

Over the last three decades an array of mindfulness-based programs, offering a myriad of applications from smoking cessation to enhancing creativity have been developed for schools, workplaces, hospitals and prison systems (Albrecht, 2015). The antecedents and practices of a large number of the programs for both adults and children can be traced back to the MBSR course (Broderick, 2013; Rechtschaffen, 2014). The course was founded by Kabat-Zinn and colleagues in the late 1970s at the University of Massachusetts Hospital (USA) and was initially called the "Stress Reduction and Relaxation" program (Kabat-Zinn, 1982).

The rationale for the program's establishment was to "catch patients who tend to fall through the cracks in the health care delivery system" (Kabat-Zinn, 1982, p.33). Kabat-Zinn's (1982) aim was to assist individuals suffering from chronic pain; those who were either dissatisfied with bio-medical health care or could no longer be helped by the Western practices of medicine. The course's primary objective was to develop the internal resources of the client through a spectrum of 1) meditation techniques; such as yoga postures (asana), mindfulness meditation and 2) education in regards to the physiology of stress, consequences of disregarding the stress response and understanding the mechanisms involved with the relaxation response, pioneered by Herbert Benson (see <http://www.relaxationresponse.org/>) from the Harvard Medical School in 1975. The program was initially 10-weeks in duration with clients attending a two-hour session once a week. The following meditation practices were taught: body scan; mindfulness of breath and other sense perceptions; Hatha Yoga; mindful walking; mindful standing and mindful eating. Didactic material included information on the relationship of stress to physical ailments, consequences of the flight or flight response and how to balance autonomic arousal (Albrecht, 2015).

An escalating body of empirical research attests to the success MBSR and other mindfulness programs in assisting both clinical and non-clinical adult populations to positively manage various forms of physical (e.g. pain) and psychological (e.g. perceived stress and anxiety) suffering and, in turn, enhance wellbeing. Further, recently published studies of mindfulness-based programs for children and adolescents suggest similar benefits stem from these populations (Meiklejohn et al., 2012). School-based mindfulness programs have been shown to improve outcomes for students in relation to their cognitive functioning, academic achievement, emotional regulation, social competence and wellbeing (Waters, Barsky, Ridd, & Allen, 2014). There are now at least 30 different mindfulness programs in schools (Albrecht, 2015). Recent statistics from the United Kingdom (UK) indicate that nearly 50% of school-age children engage in some form of mindfulness activities (Stone, 2014), with Australia following the UK's trend (Albrecht, 2015).

Notably, in relation to the aims of the current paper, two systematic reviews of 10 mindfulness curricula designed for youths (Meiklejohn et al., 2012) and 15 meditation programs in schools (Waters et al., 2014) did not include any programs or research involving ASD populations.

Literature Review

A systematic literature search was conducted during July 2015 and August 2015, using the key search terms: ASD [autism] AND mindfulness [mindful* and intervention* or program* or training]. The following databases were searched: British Humanities Index (BHI), ERIC, Google Scholar, Linguistics and Language Behavior Abstracts (LLBA), Philosopher's Index, ProQuest Education Journals, ProQuest Education Journals, ProQuest Family Health, ProQuest Nursing & Allied Health Source, ProQuest Psychology Journals, ProQuest Religion. The journal, *Mindfulness* was additionally searched for relevant articles. The search was confined to the English language with no year of publication restrictions.

Only studies that involved mindfulness-based interventions were included for review. Studies focusing on multi-component programs such as Cognitive Based Therapy (CBT), where mindfulness meditation forms a small but not significant part of the curriculum were excluded. However, studies that included mindfulness and some form of psycho-education training (e.g. Mindfulness-Based Psych-educational Program and Mindfulness Based Positive Behaviour Support) were included. Intervention studies that involved adult participants or

pre-school children with ASD were also excluded, given our interest in teachers' working with school-aged students with ASD.

The search strategy resulted in nine peer-reviewed studies that met the criteria for inclusion. These studies included five that involved participants parenting young people with ASD; two involved parents as well as their children with ASD (that is, parent-child dyads); one study was conducted with three adolescents with ASD. Only one study included teacher participants in addition to parent participants, highlighting an area for future research. Each study involved a mindfulness curriculum, though this varied. Experienced mindfulness trainers with up to 40 years personal meditation practice facilitated most of the interventions. All studies required their participants to learn to meditate and included establishing a regular home meditation practice. Key details of each study are presented in Table 1.

Table 1 Mindfulness interventions for Young People with Autism Spectrum Disorder and their Caregivers

Author and year	Country/Design	Participants	Mindfulness-based Intervention			Control	Data	Findings
			Content	Duration	Facilitator			
Benn et al., 2012	USA pre-post, 2 month f/up	32 parents (2=M, 23=F) 38 teachers (3=M, 32=F) Total n = 70	SMART-in-Education (Stress Management and Relaxation Techniques)	5 week intensive 4 x half-days per week 36 hours in total	2 x pairs of experienced mindfulness trainers (in MBSR and SMART)	Yes Wait- listed	Self reports: mindfulness, stress, anxiety, depression, positive and negative effect, personal growth, self compassion, forgiveness, empathetic concern, teaching self- efficacy/parenting self- efficacy emotion regulation self-efficacy, quality of parent-child interaction.	1. Sig. reductions in stress and anxiety 2. Increased mindfulness, self-compassion and growth 3. Increased relational competence 4. Sig. increases with relational competence in relation to teaching specifically
de Bruin et al., 2014	Netherlands pre-post, 9 month f/up Pilot study	23 adol. (aged 11-23 years) with ASD (17 = M, 6 = F) + 29 parents (11 = M, 18 F) Total n = 52	MyMind: Mindfulness training for adolescents with ASD (MyMind) and parallel Mindfulness Parenting training	9-weeks 1.5 hour weekly sessions, + "joint booster" at 9 week f/up where parents and children meditated together	2 x mental health care professionals with ASD experience + training in MBSR and MyMind.	No	Self reports: <i>Adol.</i> : mindful awareness, quality of life, rumination, worrying, and ASD symptoms. Effects on ASD core symptoms + social responsiveness reported by their parents. <i>Parents</i> : quality of life, parenting styles, parenting stress- competence, mindful awareness, and mindfulness in parenting.	1. Adol.: increase in quality of life and decrease in rumination for at post-test and f/up 2. No changes in ASD core symptoms; worrying or mindfulness (rated by adol. and parents) 3. Parents = positive changes in adolescents' general social responsiveness at f/up 4. Parents =improved competence in parenting, e.g. less lax, less reactive, less verbose parenting style 5. Parents =increase quality of life
Ferraioli & Harris, 2013	USA Random Control Trail (RCT) pre-post, 3 month f/up	15 parents of children with ASD (5 = M, 10 = F) Total n = 15	Participants randomised into either the Mindfulness Based Parent Training (MBPT) group or Skills Based Parent Training (SBPT) group	8 sessions, 2 hrs weekly	2 doctoral students supervised by a clinical psychologist	Yes	Self reports: parenting stress, general health, mindfulness, and applied behaviour. Qualitative info re participants reactions to treatment	1. Sig. decrease in parenting stress and improved general health in the mindfulness group at pre and post test (but not skills group) 2. Further decreases in stress for mindfulness group at f/up. 3. No sig. differences on either outcome measures observed for the skills group 4. Increases for both groups on intervention specific skills

Author and year	Country/Design	Participants	Mindfulness-based Intervention			Control	Data	Findings
			Content	Duration	Facilitator			
Hwang et al. 2015	AUS Mixed-methods pilot study	mother-child dyads children 5=M, 1=F aged 8-15 Total n = 6	Stage 1: Mindfulness Training (MT) for the mothers Stage 2: Parent-mediated mindfulness for children with ASD, home-based	Stage 1: 8 sessions, 2.5 hr weekly sessions (+ 2 month self-practice) Stage 2: 5 basic mindfulness activities over 12 months	Stage 1: 2 nd author with 20 years MT experience Stage 2: parents-child with initial support via 3 weekly home visits from the 2 authors + online discussion + social media over 12 months	No	Researcher interviews with children (before S2), video recording of mindfulness sessions (S1 and S2), self reports: mindfulness, parental stress, quality of life, and parents' perceptions of child problem behaviours in family contexts.	<ol style="list-style-type: none"> 1. Out of 6 mother-child dyads, 5 completed S2 2. Reduction in parenting stress and increased mindfulness at S1 3. Concomitant change in child's behaviour after S1 but before S2 4. Increase in quality of family life at S1 and further increase at the S2
Lilly & Tungol 2015	India RCT pre-post	Parents with children with ASD (F = 40) Total n = 40	Mindfulness-Based Psych-educational Program (MBPEP)	10 sessions run weekly	Not stated	Yes	Self-report: parental stress	<ol style="list-style-type: none"> 1. Sig. decrease in parental stress (exp. group) 2. Positive changes in attitudes toward their parenting a child with ASD (exp. group) 3. No change in parental stress (control group)
Robledillo et al., 2015	Spain Mixed design Pilot study	parents 6 parents (1=M, 5=F) with of adol. with ASD + 7 parents (7=F) of typically developing adolescents (age-matched) Total n = 13	Mindfulness Based Program	9 sessions 2 hrs, fortnightly	1 x psychotherapist trained in MBSR	Yes	Self reports: state-trait anxiety, mood, anger expression, general health. Salivary cortisol measurements (Csal) at week 1, 5 and 9 of intervention to measure stress.	<ol style="list-style-type: none"> 1. Positive effects on health across participants 2. Reduced anxiety, negative mood, and reduced Csal levels across participants 3. Reduced Csal <i>more</i> pronounced in parents of adol. with ASD then parents of typically developing adol.
Singh et al., 2006	USA Multiple baseline design	Parents of adol. With ASD (3=F) Total n = 3	Mindfulness Training	12 sessions, 2 hours weekly + 52 weeks of personal practice	1 on 1 training with senior investigator	No	Observational data on target behaviours (aggression, noncompliance, and self-injury) collected by mothers using a PDA. Inter-rater agreements (fathers). Parent self-reports: parenting satisfaction, interaction satisfaction, mindfulness.	<ol style="list-style-type: none"> 1. Sig. decreases in target behaviours (aggression, noncompliance, and self-injury) 2. Increases in mindful parenting 3. Increases in parent satisfaction with their parenting skills 4. Increased positive interactions with their adol. with ASD

Author and year	Country/Design	Participants	Mindfulness-based Intervention			Control	Data	Findings
			Content	Duration	Facilitator			
Singh et al., 2011	USA Single case experiment design, 3 yr f/up	adol. with ASD (3=M) 14-16yrs Total n = 3	Meditation on the Soles of the Feet (SoF)	Meditation on the Soles of the Feet (SoF) 5 x days 30mins training + practice twice daily with mothers	Parent-mediated	No	Siblings and parents provided data on occurrences of physical aggression (hitting, kicking and biting a sibling or parent) with inter-rater agreement.	<ol style="list-style-type: none"> Continual decreases in aggressive incidents across the 3 adolescents at pre and post test Minimal incidents of aggression reported at 3-yr f/up. Concomitant change in mother's behaviour (not measured)
Singh et al., 2014	USA Multiple baseline design + qualitative interviews	Parents of adol. With ASD (3=F) Total n = 3	Mindfulness Based Positive Behaviour Support (MBPBS)	8 sessions, 3 hours weekly (1-to-1 format) + 52 weeks of personal practice	Facilitator with 40-year personal meditation practice with clinical expertise	No	Observational data on challenging and compliance behaviours of adol. with ASD collected by mothers using an iPhone App. Inter-rater-agreements (fathers). Self-report: parental stress. Informal interviews with mothers.	<ol style="list-style-type: none"> Statistically sig. reductions in mothers' stress levels were correlated with positive behaviour changes in adol. Interviews indicated MBPBS was well received; mothers felt it made a difference to their lives in terms of their own personal transformation and in their interactions with their children.

Research into Mindfulness with Young People with ASD and their Parents

While the research base investigating the feasibility of mindfulness-based programs for young people is continually growing, only eight studies in total were found. Four studies were located that involved children with ASD, one study involved children with ASD only and three studies involved parent-child dyads. In the following section, we review the eight studies.

Mindfulness for Young People with ASD

Mindfulness-based programs for adults are largely modelled on the established MBSR program (Kabat-Zinn, 1982) or mindfulness-based cognitive therapy (MBCT; Teasdale et al., 2000). However, children, particularly those with ASD, may find sitting still or lying down practices difficult. Instead, rather than a specific program, particular mindfulness techniques such as deep breathing (Russell, 2011) mindful movement (Etty-Leal, 2010) or mantra, may prove more beneficial (Sequeira & Ahmed, 2012). A simple mindfulness-based technique for managing angst, anger and aggression in young people is *Meditation on the Soles of the Feet* (SoF) developed by Singh and colleagues in the late 1990s. This applied meditation practice teaches the child to direct his or her attention and awareness to a neutral body part, i.e., the soles of the feet, as a way to defuse emotionally disturbing thoughts. By calming and clearing the mind, the potential for an angry or aggressive outburst dissipates. SoF can be done while standing, sitting, or walking slowly and once learned and practiced, it can be a way to self-calm quickly when emotionally arousing situations occur. Research into SoF has shown its efficacy in controlling anger and aggressive behaviours in young people with Attention Deficit Hyperactivity Disorder (ADHD) and ASD (Singh et al., 2011; Singh, Nirbhay, Lancioni, Winton, & Fisher, 2006; Singh, Nirbhay., Lancioni, Winton, Karazsia, & Singh, 2013; Singh et al., 2007; Singh et al., 2014).

Singh et al. (2011) studied the effects of a mindfulness-based technique (SoF) to control aggressive behaviour in three male adolescents with ASD. The participants in the study had experienced behavior modification interventions and/or psychopharmacological treatments in the past with no significant long-term effect. As such, each participant's respective families felt exasperated by their son's frequent outbursts of kicking, biting and hitting a sibling or parent. In this study, the mothers of each participant taught their sons the SoF mindfulness practice over five consecutive days. During these 30-minute sessions, the adolescents sat comfortably in a chair, spine upright, hands resting gently on their thighs and feet flat on the ground. In this formal meditation posture, participants learned to become aware of the present moment, using the breath as an anchor. With their mothers' voices guiding them, the adolescents learned to become aware of any negative mind states that would precede an aggressive outburst and shift their attention to the soles of their feet - a neutral object. The participants continued to practice the SoF technique on their own using a recording on their iPods. They did this at least twice a day with their mother and whenever an emotionally charged incident occurred that could elicit aggressive behaviour.

Results showed that during baseline, the three participants were exhibiting an average of 14, 20 and 16 acts of aggression per week (respectively). During mindfulness training, aggressive incidents decreased to an average of 6.3, 4.1 and 4.7. Significantly, in the follow up period of three years after the training only 4, 3 and 3 acts of aggression respectively occurred over that entire time period. These findings indicate a strong link between the mindfulness training and the reduction in incidences of aggression towards family members in adolescents with ASD. Additionally, the authors noted that the mothers also reported changes in their own behaviours, using the SoF technique as a tool to calm themselves when they felt stressed. This

change in the mothers' behaviour may have impacted upon the study results; however, this interdependent aspect of mindfulness practice was not accounted for in the study's design.

Mindfulness for Parent-Child Dyads

Two studies located for this review comprised both parents and their children with ASD as participants. Hwang et al.'s (2015) study included the six mother-child dyads. The intention of the study was to train the mothers to become the mindfulness teacher with their own child with ASD. In de Bruin et al. (2014), 23 adolescents and their parents participated in a 9-week parallel parent-child mindfulness-based intervention.

Hwang et al.'s (2015) pilot study consisted of a two-part mindfulness-based intervention. Stage 1 (S1) involved an eight-week Mindfulness Training (MT) with the six mothers. The MT program emphasized the core practice of formal meditation and a theoretical grounding in Buddhist teachings. The mothers were then required to immerse themselves in a two-month self-practice period before commencing Stage 2 (S2). During S2, the mothers took on the role of the meditation teacher for their children with ASD. S2 did not follow a formal structure. The authors, who interviewed the children prior to S2, emphasized that it was important to differentiate the learning content to adequately meet the individual children's needs. Besides five basic meditation exercises where children learned various practices to ground their attention using the breath, bodily movement and sound, S2 was highly individualized. The basic meditation practices were filmed onto an iPhone application and children named the practices themselves promoting ownership (e.g. Lion Lying, Cat Walking). The "parent teachers" and children were encouraged to practice together as frequently as possible over a 12-month period in order to make mindfulness apart of their everyday lives.

Results of the two-stage intervention are largely positive. The direct effects of the mindfulness training for mothers included reductions in perceived stress and increased mindfulness. Qualitative data from group discussions and reflective diaries indicated positive changes to the participants' personal and family lives during the training phase. The mothers also reported positive changes in their child's behaviour after S1 but before their child commenced S2, supporting the notion that mindfulness reveals itself relationally.

de Bruin et al. (2014) report on the effects of a parallel parent-child mindfulness intervention. The study involved 29 parents (19 mothers, 11 fathers) and their 23 children (17 boys, 6 girls aged 11-23 years) with ASD. The parents participated in a 9-week mindfulness-parenting training while their children participated in parallel mindfulness training for adolescents with ASD (Mymind). Nine weeks after the last session, both parent and adolescent groups participated in a joint booster session where they meditated together. Mindful parenting training based on the Mindful Parenting manual by Bogels and Restifo (2013), incorporated MBSR/MBCT meditation practices. Issues specific to needs of parents and their child with ASD were emphasised, for example, "understanding the effect of parental reactivity, paying unbiased attention to the child, becoming aware of your own boundaries, and accepting the child and his difficulties" (p. 4). Parents were encouraged to practice meditation at home. The Mymind training for adolescents took into account the participants' age and ASD status. Sessions were highly structured and the meditation exercises used more concrete (less abstract) language. The emphasis for adolescents was to learn how to focus and enhance their attention, awareness and self-control through a variety of mindfulness practices including breathing meditation, body scan, sensory awareness exercises and yoga. Adolescents were encouraged to engage in these practices daily in order to learn how to apply mindfulness in stressful situations that involved dealing with change and coping with negative emotions (e.g. frustration).

The study used self-report surveys with both parent-adolescent participants', measuring a range of variables including mindful awareness, quality of life, rumination, worrying and ASD core symptoms. In addition, parents reported on aspects of their parenting competence. The outcomes of study indicated that while no reduction in ASD core symptoms were reported by either adolescents or their parents, parents reported improved social responsiveness in their child and adolescents reported decreased rumination and an increase in quality of life at post-test with effects lasting and apparent at the 9-week follow-up. No differences were found in worrying or mindfulness for the adolescents although they rated the overall Mymind training as "somewhat to very useful" (p. 6). Parent self-reports indicated improvements in mindfulness and quality of life, parenting styles generally as well as parenting mindfully (i.e. observing, describing, acting with awareness and non-reactivity).

Common to the parent-child dyad studies was the opportunity for the parents and children to meditate together as well as the interdependence between the parents' mindfulness practice with improved behaviours in their children. de Bruin et al. (2014) acknowledging the bi-directional parent-child interactions suggests future studies assessing whether improvements in social responsiveness in adolescents with ASD is mediated by more attentive and less reactive parenting. The experience and effect of meditation as a collaborative activity also warrants further investigation. Qualitative approaches to research how mindfulness effects human relationships may offer a way forward (Hwang et al., 2015).

Mindfulness and Parents of Young People with ASD

The current research base investigating the effects of mindfulness as a tool to support parents navigating the challenges of having a child or adolescent with ASD appears nascent. Each study measured "perceived parenting stress" as the primary variable. Out of the five intervention studies located, all involved a specific mindfulness-based program that included the explicit teaching of mindfulness meditation techniques with education (i.e. established programs in parenting skills or positive behaviour) in regards to effectively managing the challenging behaviours associated with ASD. Three of the studies included a control group. Parents in at least four of the studies were encouraged to develop a regular personal meditation practice in order to cultivate more mindful ways of being; or assume mindful parenting behaviours (Singh et al. 2006, Singh et al. 2011). This supports other research indicating that parents who are generally mindful (on mindfulness trait measures) also seem to be mindful in the context of parenting (see Conner, Maddox, & White, 2013; Jones, Hastings, Totsika, Keane, & Rhule, 2014).

Lilly and Tungol (2015) report on the development and the effectiveness of a newly developed 10-week Mindfulness-Based Psycho-Educational Program (MBPEP) for enhancing mindfulness and thereby reducing stress in parents of children with ASD. Forty mothers participated in the study, 20 were randomly assigned to a control group. The 10-week MBPEP consisted of 10 modules combining psycho-education with mindfulness-skills training. Whether the participants were encouraged to develop a personal meditation practice is not stated. Results of the study showed that parental self-reported stress among the research participants before the intervention was at a very similar high level. However, post intervention, the participants who experienced MBPEP showed a statistically significant decrease in their levels of stress compared to the control group. Further, the authors reported increased positive changes in the experimental groups' attitudes towards parenting a child with ASD, which according to the authors carries with it a felt and enacted social stigma in Asian culture in particular. Whether these positive results were specifically attributed to training in mindfulness, as a unique feature of MBPEP, was not stipulated.

Ruiz-Robledillo, Sariñana-González, Pérez-Blasco, González-Bono, and Moya-Albiol (2015) used a quasi-experimental design to measure and compare the effects of a 9-week mindfulness-based program (MBP) in decreasing health complaints and mood disturbance in parents (5 females, 1 male) of adolescents with ASD, with parents (7 females) of typically developing adolescents. MBP included different activities and ways to be mindful in everyday life including body scans, eating mindfully, acceptance, engaging in mindful activity, focussing on breathing, recalling cheerful events, using mindfulness to assist with stress, walking and nature-sound meditation, compassion and self care. Homework was given each week to the participants, focussing on the topics discussed throughout each specific session including meditation practices. The study used cortisol as a biological measure of stress as well as self-reported health surveys. While the study reported that the intervention had positive effects in self-reported general health for all participants, the reduction in post-session salivary cortisol (Csal) levels were more pronounced in the parents of the adolescents with ASD. This led the authors to suggest that parents of adolescents with ASD were more sensitive to the effects of the mindfulness exercises and meditation practiced in the sessions than the parents of typically developing adolescents who don't experience the same daily stresses of having a child with unique social, emotional and cognitive challenges.

Ferraioli and Harris (2013) report on a RCT with 15 parents (10 mothers; 5 fathers) of children with ASD. The participants were randomised into either the Mindfulness Based Parent Training (MBPT) group or the Skills Based Parent Training (SBPT) group. Both interventions were eight weeks in duration incorporating direct teaching, group discussion, role-plays and homework. The MBPT program included aspects from MBCT, specifically five core mindfulness skills: observing, describing events and personal responses, nonjudgmental acceptance, distancing from thoughts, staying present and being effective. The MBPT group had a specific focus on participants' incorporation of mindfulness techniques into their daily lives. The SBPT group participated in an established skills-based intervention for working with children with ASD. The focus for this group was for parents to acquire and implement behavioural strategies at home to effect behaviour change in their child. The study reported a significant decrease in parental stress and improvement in general health post intervention in the MBPT group only, not the SBPT group. However, the SBPT group had a higher attrition rate (18%) than the MBPT group (40%) the authors noted reluctance from some participants after randomisation to be in the mindfulness group with some participants stating they wanted "to actually learn something", signalling a potential cynicism regarding the application of mindfulness as an evidence-base tool. However, the reported success of the MBPT group evokes the aphorism that it is easier to change your own behaviour than to change somebody else's. Given this, mindfulness-based interventions allow parent participants' to be the change they want to see in their worlds.

Two studies Singh et al. (2014) and Singh et al. (2006) comprised of three mothers with adolescents with ASD participating in a mindfulness-based intervention (see Table 1 for details of Singh et al. 2006). The participants in Singh et al. (2014) participated in an 8-week Mindfulness Based Positive Behaviour Support (MBPBS) program. MBPBS combines mindfulness with Positive Behaviour Support (PBS). The mothers had prior experience of PBS so learned how to implement PBS techniques in the context of a mindfulness practice. The MBPBS has a strong emphasis on formal meditation practice and the expectations of the researchers was that the participants would develop a personal meditation practice, beginning with a few minutes each day and gradually increasing it until they reached an hour of daily formal practice. To enable this, participants were taught *Samatha* meditation a month prior to the beginning of baseline. They learned how to formally sit and become aware of the inhalation and exhalation of the breath. The mothers were taught to simply observe their thoughts and emotions, without judgement or engagement. The 8-week MBPBS curriculum included

teachings on the four immeasurables (loving kindness, compassion, joy and equanimity) and the three poisons (attachment, anger and ignorance) that, in Buddhist philosophy are the root cause of all suffering (Singh et al. 2014).

Methods for data collection were the same as in the Singh et al. (2011) study with the addition of informal interviews with the mothers. The outcomes of the MBPBS for mothers were reductions in their stress. Mothers also noted reductions in their child's challenging behaviours and improvements in pro-social behaviours (such as, complying with their parents' requests). The participant interviews provides description of the impact MBPBS had on the mothers' personal wellbeing and their enthusiasm for the meditation practice in particular, as "practicing these meditations gave them hope that the stresses and strains of family life with their children with ASD would gradually subside" (Singh et al., 2014, p. 651). These findings confirm and extend Singh and colleagues' (2006, 2011) previous research reviewed here - that teaching mindfulness-based practices to parents with children with ASD changes not only their own behaviour, but also the behaviour of their children. However, as in the Lilly and Tungol (2005) study, to what extent the findings could be attributed to the mothers training in PBS or their training in mindfulness (or the combination of both) is not accounted for.

Overall Quality of Findings

The findings of this review need to be considered against the limitations. Our review identified three key areas of limitation: sample, measures and design. With respect to samples, all studies used small sample sizes. Further, the samples were restricted in terms of demographic range (only one study involved a non-Western country). For these reasons, findings cannot be generalised beyond the participants involved.

The second area of limitation involves the reliance on self-report measures to gather data. Six of the nine studies reviewed used self-report surveys to measure participants' response to the mindfulness-based intervention experienced. The potential issues associated with relying on self-report measures are well acknowledged in the research literature (See Baer, 2011 and Grossman, 2008). One particular problem is how individuals understand various terms. For example, due to the discrepancy on the 'worry' measure between the parent and adolescent children dyads in Hwang et al. (2015), the authors acknowledge that the participants may have had different interpretations of what it means to worry or what they might personally find worrying.

One study (Ruiz-Robledillo et al. 2015) included cortisol testing as a biological indicator of stress in the parent participants in addition to self-report measures, thus providing a good example of how to move past self-report measure when studying mindfulness. However, the study didn't acknowledge the potential of cortisol variation in participants. Pollard (1995, p. 265) notes that cortisol levels are as much influenced by positive emotions as by negative emotions usually identified with stress. Singh et al., (2014) also extended the use of self-report surveys by including informal qualitative interviews with parents who have children with ASD.

The third limitation identified involves the research design. The parent-child design and measures chosen in two studies (de Bruin et al. 2014; Hwang et al. 2015) makes it impossible to disentangle which aspects of the training lead to which results; that is, to what extent did the mothers' own mindfulness practice or their roles as mindfulness teachers of their own children influence the research outcomes? Similarly, four studies combined two intervention programs: a mindfulness-based interventions with an education program providing parents with techniques for responding less reactively to their child's challenging behaviours associated with their ASD. Therefore, whether positive findings could be attributed to one intervention or the other, or the combination of both, was not included in the research design.

Likewise the participants in Singh et al. (2011) began the study with prior training in PBS and perhaps learned how to better implement PBS strategies in addition to training in mindfulness. Having said this, the inclusion of control groups in some studies was a strength and enabled the authors to demonstrate the specific benefits that mindfulness training has for supporting parents who have children with ASD in particular (Ferraioli & Harris, 2013; Lilly & Tungol, 2015; Ruiz-Robledillo et al., 2015).

Despite these potential weaknesses, we identified three key themes in relation to the potential positive effects mindfulness-based interventions can have for young people with ASD and their caregivers. Firstly, mindfulness training can positively impact on young people with ASD. Singh et al. (2011) demonstrated that young people with ASD are able learn and use a simple mindfulness-based strategy to self-manage their challenging behaviours over several years. Unlike other behavioural and psychopharmacological interventions for ASD, mindfulness programs can be individualised to take into account individual emotional and developmental needs. This was exemplified in de Bruin et al. (2014) and Hwang et al.(2015).

Secondly, mindfulness-based interventions have the potential to personally transform parents who have children with ASD. The link between parenting stress and child problem behaviours associated with ASD diagnoses is consistently reported (see Bluth et al., 2013 for a discussion of a model of the stress experienced by parents of children with ASD). Tellingly, the primary variable measured in the majority of the studies is parenting stress. However, the majority of parents who experienced mindfulness training reported positive effects in their overall health and wellbeing including feeling happier in their parenting role. This positive impact seems particularly marked when mindfulness is combined with an education program that provides parents with techniques for responding less reactively and instead with more understanding and greater empathy to their child's frustrations associated with their ASD. This is highlighted in Ferraioli and Harris' (2013) study where a combination of the two intervention treatments (parenting skills plus mindfulness training) is recommended as an effective approach.

Thirdly, mindfulness-based interventions appear to positively impact upon the parent-child relationship. A common pattern in five studies indicated that the parents' increased mindfulness positively correlated with decreases in their child's problem behaviours (de Bruin et al., 2014; Hwang et al., 2015; Singh et al., 2011; Singh et al., 2006; Singh et al., 2014). The experience and effect of meditation as a collaborative activity warrants further investigation. Qualitative approaches to researching how mindfulness affects human relationships may reveal quite different and important insights. Finally, because mindfulness is an experiential and introspective phenomenon, the importance of parents having their own embodied mindfulness practice before teaching their own children particular mindfulness practices was emphasised (de Bruin et al., 2014; Hwang et al., 2015).

Mindfulness for Teachers who Work with Students with ASD: Potential Areas for Future Research

Teachers have a significant educative as well as caregiving role in the lives of children with ASD. In Australia, students diagnosed with ASD might attend specialised schools or mainstream schools where they may or may not receive additional support, such as specialist teachers or aides. Regardless of the context, teachers can feel personally and professionally ill equipped to manage the emotional, social and academic needs of students with ASD in the classroom (Lindsay et al., 2013). The current review found only one study (Benn et al., 2012) where the researchers investigated the potential of mindfulness training with teachers (in addition to parents). This is a significant gap in the mindfulness research in ASD.

In recognising that teachers might also benefit from interventions to reduce the stress that may accompany teaching a student with ASD as well as teach in ways that may increase the wellbeing and educational attainments of their students with ASD, Benn et al. (2012) assessed the efficacy of a five week MT program for 32 parents and 38 teachers of children with special needs, which included students with ASD (representing 36% in treatment group and 53% in the control group). Participants were randomized into attending MT over the summer period (treatment group) or the fall period (wait-list control group). The MT was based on the SMART-in-Education (Stress Management and Relaxation Techniques) curriculum (www.passageworks.org). Largely based on MBSR (70% of the same components and practices), SMART also includes content focused on, “emotion theory and regulation, forgiveness, kindness and compassion, and the application of mindfulness to parenting and teaching” (Benn et al., 2012, p. 1476). Unlike the other interventions run solely for parents, the MT ran as an intensive program (a total of 36 hours over the five-week period); like other programs it involved homework such as daily sitting meditation. The teachers met for their session separately from the parents. While similar self-report surveys were used as in the previous studies reviewed, teachers, in particular provided self-reports on their teaching self-efficacy and their ability to regulate their emotions at work.

The mindfulness training positively influenced teachers’ self-efficacy beliefs. Further, with increased mindfulness, teachers “perceived that they could more effectively gauge and regulate their reactions to stressful situations in the classroom and felt more efficacious in their teaching competence” (p. 1484). The authors noted that with this increase in teachers’ mindful awareness, positive outcomes in regard to classroom climate and student learning could be expected.

Parents reported higher levels of stress and less positive effect in terms of their overall wellbeing than the teachers. This result suggests that the timing and duration of the MT training appears important. MT took place in the school break, a time when parents spend more time with their children each day. Further, five weeks may not be sufficient time for parents to feel the effects of a mindfulness practice. For teachers, the MT fulfilled a Professional Development (PD) requirement and at the time of this study, the teachers had not integrated the learning within their classrooms.

Whether these positive gains lasted once the term had recommenced was not measured. Despite the limitations of this study, offering MT training to teachers who work with students with ASD and seeking to understand whether that training may have positive benefits for students’ challenging behaviours, social interactions and learning outcomes is an empirical question that warrants investigation.

As noted earlier, beside behavioural challenges, other stress triggers for teachers who work with students with ASD in both specialised and mainstream settings include: managing unstructured time such as recess or excursions that may cause distress; the challenge of engaging students in learning activities that require the student to expand their specific

interests; and establishing rapport with the student which is an important element in any classroom (Billingsley, 2004; Lindsay et al., 2013). Just as the parent participants in the studies reviewed in this paper experienced reductions in their perceived stresses and increases in their psychological wellbeing, teachers who work with students with ASD might also benefit from the positive effects a mindfulness practice offers. One teacher participant in Benn et al. (2012, p.1484) commented, "I now know different ways to deal with things and will be able to have mindfulness in the classroom." The authors note that this sort of change would reflect positively in a positive classroom climate conducive to student learning. While only Benn et al.'s (2012) study included teachers, the use of mindfulness-based programs is growing substantially in the field of education. Teaching is widely recognised as a demanding profession and meditation and mindfulness practices are acknowledged as one way of maintaining good executive function in the context of work stress (Meiklejohn et al., 2012). Future research that investigates how a mindfulness practice can support teachers who care for and educate students with ASD is suggested.

Conclusions

The authors in the present review considered nine studies that investigated the effects of mindfulness-based interventions with young people with ASD, and their caregivers. A key aim of the review was to understand whether practising mindfulness could potentially benefit teachers who work with students with ASD.

A key insight drawn from this review was that while mindfulness is an internal expression, it reveals itself relationally. First, a common finding to each study was that the parents' increased level of mindfulness positively correlated with decreases in their child's challenging behaviours. This suggests that parents were more able to cultivate a non-judgmental acceptance of their child as well as greater compassion (both for their child and the self who parents). In six studies, decreases in children's challenging behaviours associated with their ASD, for instance, aggression, occurred in the absence of any direct intervention with the young people themselves. Second, three studies that included parent-child dyads, described that the child's more mindful way of being positively impacted upon the parent's health and wellbeing. Unfortunately, the one study that included teachers did not investigate whether the mindfulness-based training cultivated greater mindfulness in their day-to-day teaching. However, given the interdependent dimension of mindfulness implicit in each study, it is possible that teachers who work with students with ASD may experience similar benefits from mindfulness-based interventions, warranting further investigation.

Given the intrapersonal component of mindfulness practice, it is interesting to note that mindfulness in the West has largely been pursued as a solo endeavor. To date, research has focused on individual outcomes, and methods that measure mindfulness reflect this (i.e. self-reports). The participants' experiences in each study reviewed remind us that our lives are not just individual but also relational. Kramer (2007, p. 273) writes, "People live and work together; they suffer together and profoundly affect another's mind states, suffering or free." Given this promise of transformational change in the individual, mindfulness-based interventions for young people with ASD, as well as their parents and teachers are worthwhile. As expressed by Buddhadasa, a 20th Century Thai Buddhist teacher, "If we are learning anything from our meditation practice, then it reveals itself in our relationships with other people" (Buddhadasa in Kramer, 2007, p. 77).

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