Using Mindfulness-Based Interventions to Support Self-regulation in Young Children: A Review of the Literature

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Abstract
The COVID-19 pandemic has caused a rise in stress, mental health concerns, and externalizing behaviors in children and their caregivers across the globe and illuminated the need to reduce stress levels and support self-regulation skills in even the youngest of children. The goal of this literature review is to describe what research has shown about the use of mindfulness-based interventions (MBIs) to support young children’s self-regulation in early childhood settings. A total of 18 research studies conducted between 2010 and 2021 were identified. The main purposes of the studies reviewed were to examine the effects of MBIs on the development of emotional, behavioral, and cognitive self-regulation. Results showed that teachers generally found mindfulness practices feasible, acceptable, and effective in their classrooms. Although MBIs were found to have mixed effects on self-regulation in young children, positive effects on self-regulation were significantly greater for children in need of additional support, including those with difficulties or delays in developing self-regulation skills. The current review found a wide variety of MBIs used in early childhood settings globally. The results of this review suggest that teaching mindfulness practices to young children and their caregivers can both support the development of self-regulation of young children and foster socially and emotionally healthy environments in which this development can occur.

Keywords Early childhood · Young children · Mindfulness · Mindfulness-based interventions · Self-regulation

Across the globe, research has revealed the negative impacts of the COVID-19 pandemic on the mental health of young children and their caregivers (Calvano et al., 2021; Gianotti et al., 2021; Imran et al., 2020; Swigonski et al., 2021). The pandemic has caused increases in financial, physical, and mental stress, experiences of depression, and adverse childhood experiences, which have been recorded both at home and in the early childhood education setting. As noted by Kwon et al. (2019), adults’ psychological distress and expressed negative moods influence the quality of emotional supports to children and are reflected in children’s behavioral problems and difficulties with self-regulation. Thus, in the context of the COVID-19 pandemic, it is essential to develop tools to support the self-regulation of young children and their caregivers.

Self-regulation is defined as the deliberate use of skills to respond to demands of the environment in a contextually appropriate way and to achieve desired goals (Montroy et al., 2014). While there are several models to explain how humans self-regulate (Razza et al., 2015; Siegel, 2009; Willis & Dinehart, 2014; Zelazo & Lyons, 2012), common elements of these models include arousal to external stimuli, intentional awareness of this arousal, and deliberate thoughtful response that balances cognition and emotion to act towards a desired goal. More simply, self-regulation is the ability to control one’s emotions, body, and attention in order to function and achieve goals and well-being.

Research shows that self-regulation is linked to empathy and conscience development, social competence, overall social and emotional well-being, peer acceptance, and academic success (Janz et al., 2019; Moffitt et al., 2011). In young children, low levels of self-regulation are predictive of disruptive external behaviors (e.g., aggression, impulsive behaviors, defiance), higher rates of rejection and exclusion by peers, more negative commands and redirections from
teachers (Montroy et al., 2016), poor school readiness and sense of self-worth, lower academic achievement, difficulties managing stress, and high risk for substance abuse and law breaking (McClelland et al., 2013). The National Research Council and Institute of Medicine (2009) identified self-regulation as a risk factor for most mental, emotional and behavioral disorders, and as a protective factor for children with vulnerabilities for externalizing and internalizing disorders. Therefore, self-regulation is critical for success in almost every facet of life. Recent research indicates that digital learning (significantly expanded globally during the pandemic) demands substantial self-regulation skills (Linnié et al., 2021). This finding further emphasizes the need for deliberate and prompt attention to this skill during the early childhood years.

Early childhood is a critical time for the development of self-regulation skills, influenced by language skills, lived experiences, temperament, environment, and genetic inputs. Between the ages of 3 and 7, there is substantial development of the prefrontal cortex, allowing for the development of higher order thinking skills, including executive functioning, effortful control, theory of mind, and empathy (Zelazo & Lyons, 2012), which are all critical for self-regulation development (Razza et al., 2020). Research indicates that most children have foundational self-regulation skills by the end of kindergarten but 35% of children are delayed in their development of self-regulation as much as a year and a half behind their peers (Montroy et al., 2016). After the age of 7, self-regulation develops slowly (Razza et al., 2020), hindering those children who are behind their peers. Thus, the early childhood years must be considered a sensitive period for the development of self-regulation. It is essential to provide programs to support self-regulation in early childhood settings.

While there are various approaches and interventions for teaching self-regulation, mindfulness practices have been recently introduced in educational settings with the goal of promoting wellness and self-regulation in children and teachers. Secular mindfulness, introduced in Jon Kabat Zinn’s Mindfulness Based Stress Reduction (MBSR), has been clinically proven to reduce stress, promote self-compassion and empathy, increase both attention (Zenner et al., 2014) and emotional regulation (Goldin & Gross, 2010) in youth and adults. Cultivated through specific contemplative practices, including meditation, breath work, yoga, body scans, and attentional awareness to present moment (Zenner et al., 2014), mindfulness aims to reduce reactivity and judgement of experiences, increase awareness of sensations, feelings, and thoughts, and promote acting with awareness; all skills associated with self-regulation (Brown & Iannuzzi et al., 2014).

Mindfulness-based interventions (MBIs) have been found to both prevent impulsive behavior and interrupt periods of dysregulation. Research indicates that mindfulness enables cognitive and emotional awareness, diminishes emotional distraction and cognitive rigidity, and allows for intentional regulation of behavior, attention, and emotion (Siegel, 2009; Zelazo & Lyons, 2012). Farb et al. (2012) also found that mindful practices can stop dysregulation by interrupting perseveration on negative thoughts or behaviors, increasing tolerance of difficult emotional sensations, and promoting self-compassion and empathy. Blair and Dennis (2010) further determined that mindfulness allows for a cognitive and emotional rebalance, creating an opportunity for self-regulation. These research studies suggest that overt practice of mindfulness can support self-regulation.

However, the research regarding mindfulness practices and MBIs in school settings have largely focused on older children, adolescents, and adults, (Frank et al., 2015; Greenberg & Harris, 2012; Jennings et al., 2017; Zenner et al., 2014). A literature review by Nieminen and Sajaniemi (2016) described the potential of using MBIs in early childhood settings to support young children. However, their review of mindfulness studies focused on children between 3 and 15 years old with limited information on mindfulness practices for young children such as preschoolers and kindergarteners. Thus, it is critical to examine if mindfulness could be considered an evidence-based practice in early childhood settings. The main goal of the current literature review is to explore what MBIs have been used in early childhood settings and whether the programs were effective for young children’s self-regulation development, based on the following three guiding questions: (a) What does the research show about the effectiveness of MBIs in supporting the self-regulation of young children between 3 to 6 years old? (b) What do these findings suggest for future research regarding the use of MBIs in early childhood settings? and (c) What do these findings imply for the use of MBIs with young children to promote self-regulation?

**Method**

For the purpose of this review, two online databases, Web of Science and ERIC, were independently searched. In the search for articles, keywords early childhood, preschool, kindergarten, young children, mindfulness, and self-regulation were used. The electronic literature search using Web of Science produced 24 research articles. An additional search using ERIC produced 4 more articles. After reviewing abstracts of the 28 articles, studies which met the following criteria were identified for this review: (a) studies that exclusively focused on mindfulness-based interventions (MBI) in early childhood settings that served children between 3 and 6 years old, (b) empirical research studies including measures for self-regulation skills, and (c) studies that were published in peer reviewed journals between 2010 and 2021 and
written in English. Based on these criteria, 13 of 28 articles were removed: 3 articles that did not focus on early childhood settings, 3 literature reviews, 3 articles that were not published in peer reviewed journals, one study published in Spanish only, one study focused on mindful parenting skills, one study that examined the effects of a MBI on perceived discrimination, and one study that focused on participating children’s perceptions of self-regulation following a yoga based MBI. Additionally, through a secondary manual search of reference lists in the 15 found articles, 3 additional articles that met the criteria were identified. A total of 18 articles were ultimately selected for this review.

Results

This review begins with an overview of the 18 identified studies. Subsequent sections highlight the findings of the studies reviewed with regards to the effectiveness of MBIs in supporting self-regulation in early childhood education settings.

Overview of the Studies Reviewed

Participants

This review includes 18 studies, published between 2010 and 2021, involving 2,387 children from Australia, Canada, Korea, Singapore, and the United States. Children ranged in ages from 3 to 6. Seven studies (Crooks et al., 2020; Jackman et al., 2019; Lemberger-Truelove et al., 2018; Li-Grining et al., 2021; Poehlmann-Tyanan et al., 2016; Thierry et al., 2016; Zelazo et al., 2018) indicated that participants lived in economically disadvantaged communities, and one study recruited participants from a high trauma community (Razza et al., 2020). Though not all studies reported the types of early childhood programs, three studies were conducted in federally funded or subsidized preschools (Li-Grining et al., 2021; Jackman et al., 2019; Poehlmann-Tyanan et al., 2016) and one study focused on a university based early childhood center (Wood et al., 2018). Five studies indicated that the majority of the participants were bilingual Hispanic or Latin X children (Lemberger-Truelove et al., 2018; Li-Grining et al., 2021; Moreno-Gómez and Cejudo, 2019; Thierry et al., 2016; Thierry et al., 2018). In summary, the studies reviewed involved diverse participants across socio-economic levels, cultures, and risk factors. See Table 1 for more information about the participants of the reviewed studies.

Study Focus and Measures

All of the 18 studies reviewed examined the effects of MBIs on the participating children’s self-regulation (i.e., emotional, behavioral, and cognitive regulations). While almost all studies (n = 17/18) examined the effects of MBIs on cognitive regulations, 7 studies measured emotional regulation and 11 studies included behavioral regulations. Of the 18 studies, 4 studies measured all three areas of self-regulation and 5 studies focused on only one area. See Table 1 for more details about the targeted self-regulation skills examined across the studies.

In terms of self-regulation measures, researchers used various tools to assess changes in self-regulation following MBIs. The most frequently used measures (n = 14/18) were direct, performance-based assessments such as the Flanker Fish Task (FFT) and Dimensional Change Card Sort (DCCS) from the NIH Toolbox of Cognitive Function Battery (Weintraub et al., 2013), the Head Toes Knees Shoulders Task (HTKS) (Ponitz et al., 2008) and Delay of Gratification Task, also known as the Marshmallow Test, (Mischel et al., 1972) These tools were administered to participants by trained assessors outside of the classroom setting. For example, the HTKS task measured inhibitory control, behavioral regulation and working memory. The DCCS and FFT measured cognitive flexibility and working memory. In addition to the performance-based assessments, 13 of the studies used teacher questionnaires or rating scales such as Child Behavior Scale (CBS) (Merrell, 1996), Behavior Rating Scales of Executive Function (BRIEF) (Gioia, et al., 2015), Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) and Emotional Regulation Checklist (Shield & Cicchetti, 1997). These tools were based on teacher observation to measure an assortment of self-regulation skills, including prosocial behavior, emotional regulation, peer relationships, hyperactivity, conduct problems, and effortful control. Seven studies used parental scales and questionnaires such as SDQ-Parent (Goodman, 1997), CBS-Parent (Merrell, 1996), and BRIEF-Parent (Gioia et al., 2015) to measure expressions of self-regulation in the home, as observed by parents. Twelve studies combined both performance-based assessments and teacher or parental rating scales to measure self-regulation before and after MBI.

MBIs for Early Childhood

The studies reviewed revealed a wide array of MBIs used in early childhood classrooms globally. Across the 18 studies reviewed, 15 different models of MBIs were used, sharing a common element of breathwork. The programs varied widely in structure, design, skills taught, frequency of practice, and duration (See Table 2). The following three program trends emerged: Yoga-based MBI, Mind–body awareness, and MBIs combined with social-emotional learning (SEL). Yoga based MBIs (n = 2/18) utilized yoga poses and movement to integrate mindful breath work into the classroom routine. Mind–body awareness focused MBIs (n = 6/18) concentrated awareness on
physical sensations and on the breath to bring attention to present moment, emotions, and tasks at hand. MBIs combined with SEL components (n = 10/18) directly taught metacognition, social and emotional awareness and breathing based mindfulness techniques, to build awareness of emotions, behavior and attention, and social-emotional skills. The component variation revealed in the studies, as well as the variability in duration and frequency of mindfulness practice are worthy of note when considering the effectiveness of MBIs in self-regulation development.

### Effectiveness of MBIs on Self-regulation

All 18 studies reviewed examined the effects of MBIs on the participating children’s self-regulation skills (e.g., emotional, behavioral, cognitive regulation) using teacher rating scales, parent rating scales, and direct performance-based assessments, as described above. See Table 2 for findings about the effects of the MBIs across the reviewed studies.

### Emotion Regulation

Six studies examined the influence of MBIs on emotion regulation with mixed results. Changes in emotion regulation were indicated by increases in awareness of emotions and self-calming techniques, or decreases in emotional arousal, reactivity arousal, and/or expressed stress. For example, Flook et al. (2015) found significant pre/post change in emotional regulation with a large effect size ($d = 1.22$) for the MBI, but a small effect size ($d = 0.25$) was noted in emotional regulation between the experimental and the control groups. Kim et al. (2020) revealed that while the experimental group scored significantly higher for lability/negativity on the Emotional Regulation Checklist than the control group prior to the MBI, following the intervention, the experimental group had significantly reduced lability scores whereas the control group scores increased. The experimental group scored higher in emotional awareness, self-calming, and empathy than the control group following the MBI. These results suggested positive changes in emotion regulation both over time and in comparison to the control group. Several studies showed no statistically significant changes in emotion regulation as measured on direct performance-based assessments (Jackman et al., 2019; Janz et al., 2019; Thierry et al., 2016). However, teacher rating scales in both Jackman et al. (2019) and Janz et al. (2019) indicated positive changes in emotional awareness, self-calming, and internalizing behaviors. These researchers also suggested a possible positive shift in teacher perception of difficult behaviors following MBIs.

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### Table 1: Study focuses and measures

| Author & Year of publication | Number of child participants | Study Focus | Measures |
|------------------------------|-------------------------------|-------------|----------|
| Razza et al. (2015)          | 29                            | X           | X        |
| Flook et al. (2015)          | 68                            | X           |          |
| Poehlmann-Tynan et al. (2016)| 29                            | X           |          |
| Thierry et al. (2016)        | 47                            | X           | X        |
| Lemberger-Truelove et al. (2018) | 23                         | X           | X        |
| Lim and Qi (2017)            | 122                           | X           |          |
| Wood et al. (2018)           | 27                            | X           | X        |
| Leyland et al. (2018)        | 156                           | X           | X        |
| Moreno-Gómez and Cejudo (2019) | 74                          | X           | X        |
| Thierry et al. (2018)        | 296                           | X           |          |
| Viglas and Perlman (2018)    | 127                           | X           | X        |
| Zelazo et al. (2018)         | 218                           | X           | X        |
| Jackman et al. (2019)        | 262                           | X           | X        |
| Janz et al. (2019)           | 55                            | X           | X        |
| Crooks et al. (2020)         | 584                           | X           | X        |
| Kim et al. (2020)            | 83                            | X           | X        |
| Razza et al. (2020)          | 89                            | X           |          |
| Li-Grining et al. (2021)     | 98                            | X           | X        |
Behavioral Regulation

Across the 18 studies, 10 studies examined the influence of MBIs on behavioral regulation. Changes in behavioral regulation were measured with decreases in hyperactivity, aggression and behavioral problems, and increases in impulse control. All of the 10 studies indicated a positive change in behavioral regulation for children who participated in the MBIs. While some reported an overall positive direction of behavior change (Li-Grining et al., 2021; Wood et al., 2018), other studies revealed reductions in conduct and behavioral problems, including hyperactivity and
functions in circumstance of greater cognitive challenge for children in a multiyear MBI, in which mindfulness practices were integrated into the daily schedule of the classroom over two years. The study revealed that the MBI was effective for promoting emotional and cognitive self-regulation as well as higher vocabulary scores and reading scores.

Parent Involvement

Parent involvement in the studies reviewed was limited. Only Jackman et al. (2019) included a component for training parents in the use of mindfulness practices at home, and participation level in this training was noted as low. Several studies included parent ratings in addition to teacher ratings in measures of self-regulation (Crooks et al., 2020; Jackman et al., 2019; Li-Grining et al., 2021; Wood et al., 2018; Zelazo et al., 2018), though low levels of completion of these rating scales were reported. Notably, discrepancies were found between parent ratings and teacher ratings in terms of changes in children’s self-regulation after their participation in MBIs.
participations in MBIs. Possible explanations for these discrepancies may include that self-regulation growth may not have generalized to the home environment, potential bias on the part of teachers who were responsible for implementing the intervention, or lack of knowledge of skills and language of mindfulness and thus inability to reinforce the use of mindfulness techniques at home. In addition to parent ratings for self-regulation measures, several researchers asked parents to complete the social validity measures of MBIs, which all showed overall positive results (Kim et al., 2020; Li-Grining et al., 2021; Wood et al., 2018). For example, in Li-Grining et al., 14 of 15 parents expressed interest in learning and implementing mindfulness practices in the home.

Discussion

Results from the studies reviewed demonstrated that over time, with practice and integration, mindfulness programs can support the development of self-regulation in young children, particularly cognitive regulation, but emotional and behavior regulation as well, with potential academic benefits. Research indicates that mindfulness programs particularly help children who face additional economic, domestic, temperamental, behavioral, or cognitive challenges, as these children consistently exhibited the most growth from MBI programs. The plethora of MBI in use reflects a demand for mindfulness programs across age groups. Teachers who use mindfulness programs, both those with experience and those for whom the practices are a novelty, find the programs feasible, acceptable, and desirable. Teachers also report that the programs help their children show more prosocial behaviors, use more kindness language and actions, and be more aware and empathetic (Flook et al., 2015; Jackman et al., 2019), thus improving the overall atmosphere in the classroom. As previous research has indicated, mindfulness supports the mental health and emotional regulation of teachers, providing a healthier classroom environment for all children.

Related to the effectiveness of MBIs, the majority of the reviewed studies (n = 15/18) reported on the social validity and feasibility of MBIs. Several researchers measured the social validity based on participating parents’ reports, which indicated desirability and acceptability of MBIs (Kim et al., 2020; Li-Grining et al., 2021; Wood et al., 2018). Jackman et al. (2019) showed that MBIs were considered as feasible, acceptable, and desirable by teachers as well, though the teachers also reported that they rarely found time in the school day for the recommended 20 minutes of teacher meditation. Both Flook et al. (2015) and Li-Grining et al. (2021) showed that participating teachers reported MBIs to be affordable and simple to implement, while other studies (Razza et al., 2020; Viglas & Perlman, 2018; Wood et al., 2018) pointed out the lack of sustainability for MBIs that demanded outside instructors to implement the program. In this light, MBIs, which train teachers to use mindfulness in the classroom and to teach children mindfulness techniques, have potential for integration of the programs into the daily schedule and culture of the classroom, and therefore to promote generalization beyond the classroom (Wood et al., 2018). As noted in Li-Grining et al. (2021), when trained in MBIs, teachers used the techniques more frequently than expected, and teachers reported using mindfulness to “turn transitions into teachable moments.” Future program development and studies may benefit from focusing on training teachers in mindfulness, integrating mindfulness into the daily schedule and activities of the classroom, and extending training to parents, guardians and caregivers to support generalization outside of the school environment.

Implications for Future Research

Several limitations were found in the studies reviewed. One limitation was related to sample size. Most of the studies included a small sample and the median sample size for the 18 studies reviewed was 86. Only four of the studies included over two hundred participants (Crooks et al., 2020; Jackman et al., 2019; Thierry et al., 2018; Zelazo et al., 2018). Thus, these results suggest a need for more studies with larger sample sizes that include various early childhood settings serving children with diverse backgrounds (e.g., cultural, linguistic, socio-economic backgrounds) as well as children at risk or children with disabilities.

Another limitation includes some issues in measurements. First, of the 13 studies which used teacher rating scales to measure changes in children’s self-regulation, only four studies included a small sample and the median sample size for the 18 studies reviewed was 86. Only four of the studies included over two hundred participants (Crooks et al., 2020; Jackman et al., 2019; Thierry et al., 2018; Zelazo et al., 2018). Thus, these results suggest a need for more studies with larger sample sizes that include various early childhood settings serving children with diverse backgrounds (e.g., cultural, linguistic, socio-economic backgrounds) as well as children at risk or children with disabilities.

Another issue in measures is that only three studies included follow up measures, each noting ongoing growth in self-regulation up to 6 months later (Moreno-Gómez and Cejudo, 2019; Zelazo et al., 2018). Lack of follow up measures may preclude determination of prolonged changes in self-regulation due to the MBIs. Thus, future research needs to consider blind measures and follow-ups when examining the effectiveness of MBIs.

Additionally, the intervention fidelity is an area that needs more attention. Across the 18 studies, 15 different programs were used under the umbrella of MBI. Each MBI’s unique characteristics, including intervention components, duration and frequency of the MBI, and teacher training and program fidelity, limit the ability to determine which characteristics...
of each program support emotional, behavior, or cognitive self-regulation, and what factors moderate the effects of the interventions. This issue is addressed by several researchers (Crooks et al., 2020; Thierry et al., 2018; Viglas & Perlman, 2018; Zelazo et al., 2018), all of whom recommend closer examination of specific components of MBIs and measures of those components to determine which practices directly support (a) the development of self-regulation, (b) different facets of regulation and (c) the maximum child engagement in mindfulness-based programs. Only six studies reviewed reported measures for intervention fidelity using teacher rating scales (Crooks et al., 2020; Janz et al., 2019; Li-Grining et al., 2021; Thierry et al., 2016, 2018; Wood et al., 2018). Thus, future research needs to examine intervention fidelity that can help researchers more accurately interpret the study outcomes and replicate the MBIs.

As described in the results section, many of the MBIs used in the reviewed studies did not include substantial parental participation. Only five studies (Crooks et al., 2020; Jackman et al., 2019; Razza et al., 2015; Thierry et al., 2016; Wood et al., 2018) included parental measures for their children’s change in self-regulation. Only the study by Jackman et al. (2019) included parental training in mindful parenting skills. Lack of significant parental involvement, in the form of training in mindful parenting skills and mindfulness practices, may prevent the usage of mindfulness practices outside of the school environment. Given the significant influence that parenting and other cultural factors play on the development of self-regulation, a lack of family components in the MBIs may impact the ability of children to generalize mindfulness practices across home and school settings. Thus, researchers have recommended the inclusion of parent components, including mindfulness training in future MBI research efforts (Crooks et al., 2020; Flook et al., 2015; Jackman et al., 2019; Janz et al., 2019; Li-Grining et al., 2021; Razza et al., 2020; Zelazo et al., 2018).

Additionally, attention should be drawn to the need for measuring children’s perceptions of mindfulness practices, and the effect that self-awareness has on children’s self-regulation of emotions, attention, and behaviors. Components of the OM program (used in Jackman et al., 2019), the MindUp program (Thierry et al., 2016) and the Settle Your Glitter program (Thierry et al., 2018), which included direct lessons in neuroscience, emotions, impulse control, and awareness, should be examined to determine the role the programs play in increasing children’s self-awareness, and the subsequent impact this has on self-regulation. As revealed in Rashedi and Schonert-Reichl (2019), children who participate in MBIs use more language related to awareness of their self-regulation skills. In this light, including children’s perspectives in research has potential to shed light on the value of direct instruction in metacognition and self-regulation, and should be included in future research regarding using MBIs to build self-awareness, as a potentially essential component of self-regulation.

Additional research into the impact of MBIs on the atmosphere and stress of the classroom is also worthy of consideration. Jennings et al. (2017) found that using mindfulness practices in the classroom reduced teacher stress, and improved the well-being and overall quality of the classroom. Janz et al. (2019) suggested that mindfulness in the classroom reduced the stress levels of teachers and thus lowered the incidence of emotional reactivity of teachers to challenging behaviors of the classroom. Thus, exploring the impact of mindfulness-based programs on teachers’ perceptions of challenging behaviors would, therefore, be an important topic of future research. In addition, several studies (Flook et al., 2015; Razza et al., 2015, 2020; Zelazo et al., 2018) that measured changes in participating children’s stress and cortisol levels also provided further insight into the benefits of mindfulness on children’s stress levels and subsequent abilities to self-regulate. If mindfulness work can lower the stress and emotional reactivity of teachers, similar changes may be found in children who practice mindfulness. In this way, incorporating mindfulness into daily classroom routines in early childhood settings may result in less stressful environments, less emotional reactivity, and thus a healthier emotional climate for the development of self-regulatory skills. Given the current context of the global COVID-19 pandemic and its impact on teachers, families, and school environments, use of mindfulness skills in the classroom seems to be more urgently needed than ever.

**Implications for Practice and Policy**

Results from the current review showed positive effects of mindfulness-based programs on the development of self-regulation skills in young children. Despite the short duration of some studies and the need for longitudinal studies to track the effects of mindfulness practices across multiple years and settings, the research findings were positive regarding mindfulness-based programs, their feasibility and acceptability in the classroom, and general teacher perceptions of the program values in early childhood settings. Given these trends, administrators, social workers, guidance personnel, teachers, and families may benefit from increasing their knowledge of MBIs, which are designed to bring mindfulness into the classroom setting and the home setting in an age-appropriate manner for young children. Professional development opportunities that focus on teaching mindfulness skills to teachers via programs such as *Cultivating Awareness and Resilience in Education* (CARE; Jennings et al., 2017) or *Mindfulness Based Stress Reduction* (MBSR; Kabat-Zinn, 2003), have potential to build a foundation for bringing mindfulness into schools and reducing the
overall stress level of teachers (Razza et al., 2020). Further professional development which introduces teachers to age appropriate mindfulness tools and programs for children, and which reflect research findings regarding maximizing young children’s engagement (Poehlmann-Tynan et al., 2016; Rashedi & and Schonert-Reichl 2019; Wood et al., 2018) has potential to support the organic integration of mindfulness practices into classroom routines, reduce the need for supplemental instructors or specialists, and promote program sustainability (Flook et al., 2015; Poehlmann-Tynan et al., 2016; Razza et al., 2020).

The current review further highlights the potential role of families in the development of mindfulness skills of young children. As noted above, several researchers iterated the importance of increasing parental involvement in MBIs to increase the potential for reinforcement at home, and generalization of mindfulness skills and self-regulation skills across multiple settings. Generalization of skills across settings suggested by the multi-year work of Thierry et al. (2016) and prolonged use of mindfulness practices throughout development has the potential to support self-regulation skills, reduce stress, and promote overall wellness for children. As parents/guardians are ideally a constant for children throughout their lives, their involvement is essential to ongoing use of practices to support self-regulation. In this light, early childhood settings may benefit from providing opportunities to share mindful parenting skills, and mindfulness practices with parents and guardians, through parent education opportunities, feedback and support conversations with parents, weekly communications with parents, or shared training in the programs (e.g., CARE or MBSR) as noted above.

As noted across the studies reviewed, MBIs used in early childhood settings had positive effects on all children, but the most significant effects on the children who needed the skills the most (e.g., children with delayed self-regulation, experienced trauma, or executive functioning deficits). Given these findings, the potential for mindfulness to support the development and health of children as a targeted Tier 2 or intensive Tier 3 intervention is worth exploration. For example, the successful use of an MBI in dialectical behavioral therapy for adolescents (Goldstein et al., 2007) and Siegel’s Mindsight for young children (2007) across the developmental spectrum indicated a potential for targeted and intensive age-appropriate use of mindfulness interventions. Given the significance of self-regulation in relation with the trajectories of social and emotional health, utilizing mindfulness tools intensively with young children who exhibit dysregulation has potential to build protective factors against later developing behavioral and academic difficulties and social and emotional disorders.

Finally, it is important to note the implications of this research for educational policy. As research indicates, self-regulation skills play a significant role in young children’s successful trajectory that includes the development of resilience, social emotional skills, and coping strategies (Janz et al., 2019; McClelland et al., 2013; Moffitt et al., 2011; Montroy et al., 2016). It is thus the responsibility of educational policy makers to refocus measures of early childhood program effectiveness on children’s emotional, behavioral, and cognitive self-regulation skills and well-being and to support administrators and teachers to incorporate developmentally appropriate mindfulness-based programs in daily school activities. Despite this need, public funding for early childhood centers in the United States is increasingly tied to academic and cognition-based outcomes (U.S. Department of Health and Human Services, 2021). Policy support for MBI use in the school setting and funding to support research of MBIs for children of all ages, have potential to support the emotional and academic success of all children, including very young children. These supports will help the development of healthy school environments and provide opportunities for children to practice self-regulation skills, which are necessary for life success.

Limitations and Conclusion

The current literature review has several limitations. First, when searching for articles for this review, the broad spectrum of mindfulness-based programs was not anticipated. In this light, results of this review did not provide differentiations among the MBIs (e.g., yoga based, sensory awareness focused, or mindfulness plus SEL). While this review revealed this plethora of programs and the growing momentum of mindfulness programming in early childhood, the variety of the program components brings into the review a wide range of potential moderators, which make determination of effectiveness difficult. Another limitation was that all studies reviewed focused on mindfulness as universal programs in general early childhood classroom settings. As mentioned above, studies which examine MBIs in small group settings with targeted at-risk populations or in intensive therapies with young children may provide additional insight regarding the potential of MBI for supporting self-regulation development. Finally, as this review included studies published in peer-reviewed journals that examined mindfulness and MBIs in early childhood settings, these inclusion criteria limited the extent that other literature such as book chapters, unpublished studies or thesis, and literature review papers could be identified and included.

Despite the limitations, findings from this literature review provide a thought-provoking view of mindfulness practices and MBIs used in early childhood settings. The momentum mindfulness programs are currently experiencing in school settings (Oaklander, 2016) cannot happen without research support. As described above, ongoing research...
on mindfulness in schools, and education of practitioners and teacher trainers in the skills of mindfulness hold significant potential to increase the health and wellness in schools, and provide vulnerable children with protective skills to support their success. In an era in which educators, families, and children are facing unprecedented levels of stress and distress caused by a global pandemic, the need for these skills feels more important than ever.

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