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RESEARCH ARTICLE

Effects of Mindfulness-Based Practices on Children's Self-Regulation: A Review on Early Childhood Research

Aylin SOP , Buse HANÇER 

Department of Early Childhood Education, Burdur Mehmet Akif Ersoy University Faculty of Education, Burdur, Turkey

Abstract

In studies conducted on the early childhood years in recent years, there has been an increase in the number of mindfulness-based practices in the development of mental and physical health. Mindfulness is used to develop awareness-related skills such as attention, concentration, emotion regulation, and metacognition that improve self-regulation while children are aware of their experiences. In the current study, the literature was reviewed with 17 studies published between 2010 and 2022 on the effectiveness of mindfulness in the self-regulation skills of children aged 3–7. The reviewed studies were analyzed with the content analysis technique, and the findings were presented in themes and codes. As a result of the research, 17 studies have demonstrated that mindfulness improves children's self-regulation skills and reduces negative emotions and behavior. The studies have demonstrated that frequent use of mindfulness training in early childhood supports children's skills such as positive social behavior, empathy, prosocial behavior, executive function, and emotion management and is associated with higher levels of emotion, thought, and behavior regulation skills. Considering the data obtained from the results, it benefits teachers and educators to make mindfulness-based programs common for children's emotion, attention, and behavior regulation from an early age. Potential aspects for further research were also discussed.

Keywords: Awareness training, content analysis, early childhood, mindfulness, self-regulation

Introduction

Early childhood may take time for children to learn to cope with their emotions and thoughts. Problems in regulation skills, such as impulsive actions, inadequate attention control, and inability to control emotions, are frequently experienced among young children (Akman et al., 2008). However, it is expected that each individual has the skills to manage his/her emotions and behavior. Self-regulation is defined as the ability of children to control their emotions, behaviors, and desires, to delay or suppress them when necessary, to use their attention appropriately, and to obey the rules (Aydın & Ulutas, 2017). Children, who interact with their environment, gain some experiences and can direct their internal thought processes and external behavior to reach the goals they have set with these experiences (Bronson, 2019). Self-regulation is the ability to control thoughts, behaviors, actions, and attention in this process (McClelland & Cameron, 2012). In other words, self-regulation is individuals' recognizing the environment they are in, regulating their behavior in accordance with the goal they have set to adapt to the environment they are in, determining how to communicate with their environment to achieve their goal, and having self-awareness (Cleary & Zimmerman, 2004). Self-regulation is the ability to control one's emotions, body, and attention to perform one's functions and achieve well-being. Self-regulation skills, which start to develop at an early age and affect the development of the child in many aspects, develop rapidly in the preschool period (Aksoy & Tozluduman Yaralı, 2017; Erol & İvrendi, 2018).

Self-regulation, which develops in early childhood, is an important skill affecting children's future lives (Karreman et al., 2006; McClelland & Cameron, 2012). It has been determined that children who have developed self-regulation skills are more successful in academic fields, adapt more easily to new situations they face, and adapt more easily to other children in processing, storing, and evaluating information (Şepitci, 2018). It has been stated that children with high self-regulation skills are less anxious about events than other children (Erkan & Sop, 2018). They are less depressed, more aware of how to cope with stressful events they experience, and how they will behave in situations that form a source of stress in the future (Buckner et al., 2009). Also, it is seen that children with self-regulation have the skills to initiate, maintain, and end a situation, event, or action in a planned way, and they are individuals with strong interpersonal relationships because they can adapt more quickly when they face different situations and people (Bernier et al., 2010). Young children have a high potential to experience social and academic problems such as low levels of self-regulation, negative behavior (e.g., aggression, impulsive behavior, challenge), negative attitude towards school, peer rejection or exclusion (Montroy et al., 2016), poor school readiness and sense of self-esteem (Aras, 2015; McClelland et al., 2013), difficulties in managing stress (Beauregard et al., 2006). Supporting children with undeveloped self-regulation positively affects their future academic achievement and social competence (Aksoy & Tozluduman Yaralı, 2017; Aras, 2015).

A healthy self-regulation process is of great importance for children to become healthy individuals. Considering that self-regulation skills

Corresponding Author: Aylin Sop, E-mail: adursun@mehmetakif.edu.tr

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are thinkable, learnable, and controllable, external support is needed to support these skills (Çihtaş, 2011). For this reason, it is very important to prepare appropriate environments and opportunities for children to gain these skills during this period (McClelland & Cameron, 2012). Preschool education is the most appropriate and effective environment for children to develop self-regulation skills and acquire positive social-emotional behaviors and skills. For this reason, there is a need for systematic and planned educational programs that enable children to acquire and develop these skills from the preschool period (Liman & Tepeli, 2017).

Mindfulness-Based Practices

Mindfulness is the practice of paying attention to young children in a very special way. To some extent, it teaches children to develop an awareness of themselves, others, and their environment. Mindfulness practices, which are beginning to be a trend in school settings, are an approach often referred to as mindfulness-based stress reduction (or MBSR). It has emerged as a scientifically researched approach related to Buddhist practices built by Jon Kabat-Zinn in the late 1970s (Burke, 2009; Flores, 2016). Several programs exist that use mindfulness, such as MBSR, mindfulness-based cognitive therapy, dialectical behavior therapy, and acceptance and commitment therapy (Burke, 2009). These interventions usually include techniques such as breathing exercises, body scanning, meditation, and attention control (Davidson, 2010). The MBSR program can be used as a supportive, preventive, complementary method or as a method on its own. Integrating this capacity into our daily lives provides a resource that can be beneficial while intensely struggling with bodily symptoms and difficult emotions. Stress is used to cope with challenging situations and emotions (Mindfulness Institute, 2022). Limited information is available on the effects of stress, arousal, and anxiety on young children's ability to control their behavior. Mindfulness-based approaches can support the development of self-regulation by planning age-appropriate activities that will enable children to think about their experiences while reducing anxiety and stress (Zelazo & Lyons, 2012).

Mindfulness is defined as being aware of one's thoughts and actions at the moment (Lawlor et al., 2014). Kabat-Zinn (2003) defined it as the state of awareness by paying attention to the emergence of the experience by focusing on the present moment. Mindfulness requires only paying attention and seeing things as they are, not trying to change things (Kabat-Zinn, 2003). Mindfulness training is a way to help children in early childhood to focus their attention, direct their attention, regulate their behavior, and establish meaningful interpersonal relationships by being aware of their feelings and thoughts (Atalay, 2020). The four main components behind mindfulness practice are the change in attention regulation, awareness of emotions, body awareness, and self-view (Tang et al., 2015). In mindfulness practices, high-level thinking skills such as reasoning, problem-solving, and planning are also developed in addition to using inhibitory control, working memory, and cognitive flexibility skills, which are the main components of executive function skills (Thierry et al., 2016).

In recent years, studies on preschool children have shown an increase in the number of mindfulness-based practices that teach awareness skills to increase children's psychological health and well-being. Although there has been an increasing interest in practices with children and adolescents with the emergence of a small group of research literature, interventions and research have been conducted mostly in adult populations (Burke, 2009). Programs prepared for adults have been adapted to the ages and development of children, and mindfulness interventions for children have started to be included in the literature (Bockmann & Yu, 2022). In the last decade, although limited, studies on mindfulness have shown that mindfulness-based programs can affect the well-being and learning of preschool children (Erwin et al., 2017).

The preschool period is considered a critical period for children's self-regulation development. It shows that mindfulness-based practices in children's self-regulation development provide cognitive and emotional awareness, reduce distraction and cognitive rigidity, and allow for the deliberate regulation of behavior, attention, and emotion (Zelazo & Lyons, 2012). Studies have found that the inclusion of mindfulness-based training programs in school environments positively affects children's self-regulation (Viglas, 2015; Zimmerman, 2018), provides cognitive control and personal relaxation (Schonert-Reichl et al., 2015), reduces problem behaviors, and supports emotion regulation (Willenbrink, 2018; Yıldızhan, 2019) and executive function skills (Lertlataluck et al., 2021). Many studies (Janz et al., 2019; Zelazo & Lyons, 2012) and systematic screening, and meta-analytical studies (Maynard et al., 2017; Zenner et al., 2014) reporting the effectiveness of mindfulness programs placed in educational environments prove that teachers are more effective when they are involved in the process rather than acting as external experts.

In the present study, the research results of the studies conducted in the last 12 years investigating the effectiveness of mindfulness-based practices in the self-regulation of early childhood children were reviewed. This study focuses on the results of mindfulness-based practices and research conducted with children between 3 and 7 in Turkey and the world. The distributions of the studies conducted between 2010 and 2022 were examined by considering the publication years, methods, data collection tools, and findings. In this context, an answer was sought to the question, "What is the effect of mindfulness-based practices on the self-regulation of children in early childhood?" In addition, answers were sought for the following sub-problems: (a) What is the effect of mindfulness-based practices on the emotional regulation skills of preschool children? (b) What is mindfulness-based practices' effect on preschool children's cognitive regulation skills? Finally, (c) What is the effect of mindfulness-based practices on behavior regulation skills of children in early childhood?

Methods

In this study, a systematic review methodology was conducted in the international literature, which examines empirical studies reflecting the effects of mindfulness-based practices on children's self-regulation skills in early childhood. Systematic literature reviews are the structured and comprehensive syntheses of a large number of studies conducted with similar methods to determine the best research evidence that can be obtained by experts in the field (Karaçam, 2013).

Selection of Studies and Search Terms

In the study, databases were scanned using self-regulation, mindfulness, awareness, early childhood, kindergarten, and young children keywords. Forty-five studies were reached between 2010 and 2022. Twenty-eight of the 45 articles that did not meet the inclusion criteria were not included within the scope of the study. As a result, 17 studies that met the inclusion criteria within the scope of the research were included in the research focus. A total of 17 publications, two from the Web of Science database, five from the PubMed database, seven from the Springer database, two from the Eric (The Education Resource Information Center) database, and one from the EBSCOhost database, were examined within the scope of the research.

Some criteria were determined for the studies included in the current study:

1. All empirical studies, including cross-sectional studies and longitudinal studies, were included in the research. Systematic review and meta-analysis studies were excluded.

2. In the studies included in the study, the age of the children in the primary sample group was limited to 3–7 years. As the second sample group, the parents or teachers of children aged 3–7 were also considered within the sample.
3. Studies with the English and Turkish language are included in the article.
4. Studies published in peer-reviewed journals between 2010 and 2022 were included in the research.

Data Analysis

Content analysis was used in the analysis of the selected documents. Content analysis is the systematic process used to describe the content and prepared by the researcher through coding and cataloging to evaluate documents (Merriam, 2018). In order to categorize the studies included in the current study and to prepare codes, examinations were made and a “research review form” was developed by the researchers. In line with this form developed, coding related to the study design, sample, number of participants, data collection tools, and research results were categorized. Studies categorized by content analysis were grouped into themes and presented in tables. Studies meeting the inclusion criteria were coded by two independent coders. Then, the coders met and decided on the final status of the themes and sub-themes. For the reliability calculation of the study, the reliability formula proposed by Miles and Huberman (1994) was used: $Reliability = \frac{Consensus}{(Consensus + Disagreement)}$. According to Miles and Huberman (1994), the consensus among the coders, which is stated as internal consistency, is expected to be at least 80%. In line with the result obtained, the reliability of the study was found to be 87%.

Results

In this part of the study, the findings of the research were included to examine the research on mindfulness-based practices in the self-regulation of children aged 3–7 years; the targeted self-regulation skills, data collection tools, and their distribution according to the descriptive findings for the model are presented in the studies included in the study.

Information about the publication years and focuses of the studies examined in the study is presented in Table 1.

In the examination of Table 1, it is seen that there are mindfulness-based practices on children’s self-regulation skills. These studies were mostly conducted in 2013 and 2015 ($n=5$). Nine studies investigated the effect on children’s emotion regulation skills, 11 examined the effect on behavior regulation skills, and 16 studied the effect on cognitive regulation skills.

The data on the patterns used in the studies examined are given in Table 2.

In examining the patterns used in the 17 studies, it was determined that the most used research pattern was screening ($n=11$). The second design mostly used in the studies was the quasi-experimental design ($n=4$).

Information on the data collection tools used in 17 studies included in the study is presented in Table 3.

As seen in Table 3, the effect of mindfulness-based practices on children’s self-regulation skills was examined using evaluation, rating and observation forms, questionnaires, interviews and observations, and direct performance-based scales in all studies. At the same time, it was determined that the researchers used more than one data collection tool to measure the different skills of the studies. It is seen in the examination of Table 3 that the most frequently used data collection tool in the studies is the scale ($n=15$). The observation was used in

Table 1.
Publication Years and Focuses of the Research Studies

| Author/Publication Year | Publication Code | Study Focus | | |
|-------------------------------------|------------------|--------------------|---------------------|----------------------|
| | | Emotion Regulation | Behavior Regulation | Cognitive Regulation |
| Razza, Bergen-Cico & Raymond (2013) | M1 | | | x |
| Flook et al., (2015) | M2 | x | | x |
| Thierry et al., (2016) | M3 | x | x | x |
| Lim & Qu (2016) | M4 | | | x |
| Poelmann-Tynan et al. (2016) | M5 | x | x | x |
| Viglas & Perlman (2017) | M6 | | x | x |
| Moreno-Gómez and Cejudo (2019) | M7 | | x | x |
| Lemberger-Truelove et al. (2018) | M8 | | x | x |
| Wood et al. (2018) | M9 | | x | x |
| Leyland et al. (2018) | M10 | | x | x |
| Zelazo et al. (2018) | M11 | x | | x |
| Janz et al. (2019) | M12 | x | x | x |
| Berti & Cigala (2020) | M13 | x | x | x |
| Crooks et al. (2020) | M14 | x | x | x |
| Who et al. (2020) | M15 | x | x | |
| Lertlaldaluck et al. (2021) | M16 | | | x |
| Xie et al. (2022) | M17 | x | | x |

seven studies, a questionnaire was used in six studies, an interview was used in three studies, an evaluation form was used in two studies, a rating form was used in one study, and an observation form was used in one study.

The data on the sample size of the studies are presented in Table 4.

In examining the data on the sample size of the studies, it is seen that most of the studies ($n=10$) include small samples. It was determined that there were ten studies with a sample size of 20–60, three studies with a sample size of 60–100, one study with a sample size of 100–150, one study with a sample size of 150–200, and two studies with a sample size of 200 and above.

Figure 1 shows that children’s self-regulation skills of mindfulness-based practices are categorized into three sub-dimensions.

Within the scope of the study, three themes related to the targeted self-regulation skills were formed. These themes were determined as emotion regulation, behavior regulation, and cognitive regulation. Sub-themes were prepared for each theme determined. Findings regarding the themes and sub-themes examined within the scope of the research are presented below.

Table 5 summarizes the information about the sub-themes and publication codes formed under the theme of emotion regulation.

Table 2.
Distribution of the Studies According to Research Pattern

| Pattern Used in the Study | n | Publication Codes |
|---------------------------|----|-----------------------------------|
| Survey | 10 | M2, M4, M7, M8, M9, M10, M11, M15 |
| Quasi-experimental | 4 | M5, M6, M13 |
| Experimental | 1 | M12, M14, M16, M17 |
| Cross-sectional research | 1 | M1 |
| Longitudinal | 1 | M3 |

Table 3.
Distribution of Studies According to Data Collection Tools Used

| Data Collection Tools | n | Publication Codes |
|-----------------------|----|---------------------------------------------------------------|
| Scale | 14 | M2, M3, M4, M6, M7, M8, M9, M10, M11, M12, M14, M15, M16, M17 |
| Observation | 7 | M1, M2, M3, M6, M8, M13, M14 |
| Survey | 6 | M1, M5, M7, M12, M15, M17 |
| Interview | 3 | M4, M5, M13 |
| Evaluation Form | 2 | M11, M16 |
| Rating Form | 1 | M14 |
| Observation Form | 1 | M10 |

Table 4.
Findings Regarding the Sample Size of the Studies

| Sample Size | n | Publication Codes |
|------------------|----|--------------------------------------------|
| 20-60 Children | 10 | M3, M4, M5, M6, M7, M8, M12, M13, M14, M17 |
| 60-100 Children | 3 | M2, M10, M11 |
| 100-150 Children | 1 | M1 |
| 150-200 Children | 1 | M15 |
| >200 Children | 2 | M9, M16 |

In Table 5, the results of the studies (n=10) examining the effect of mindfulness-based practices on children's emotion regulation skills are coded as sub-themes. Five sub-themes were formed under the theme of emotion regulation. Studies were mostly conducted on the sub-theme of coping with undesired emotions (n=5) and understanding emotions (n=5). In general, studies have revealed that mindfulness-based programs increase children's emotional awareness and develop emotional control and empathy skills. For example, in the study coded M15, it was determined that the children in the experimental group were better at emotion regulation, resilience, and positive social behaviors compared to the control group by the effect of OpenMind-Korea, a conscious mindfulness-based social and emotional learning program (Kim et al., 2020). In the study coded M5, Poelmann-Tynan et al. (2016) stated that children's empathy skills improved positively in line with the findings obtained as a result of the pilot application of mindfulness-based preschool activities. Thierry et al. (2016) found that students who had the MindUP curriculum showed more improvement in social and emotional competencies (e.g., empathy, emotional control, optimism, and positive social behaviors) compared to those in the control groups (M3). The results of this study show that mindfulness practices support children's emotion regulation skills.

Information on the sub-themes and publication codes formed under the theme of behavior regulation is shown in Table 6.

In the examination of Table 6, 11 studies examining the effect of mindfulness-based practices on children's behavior regulation skills (M3, M5, M6, M7, M8, M9, M10, M12, M13, M14, M15) were found. Seven sub-themes were formed under the theme of behavior regulation. Two studies addressing the sub-theme of delay of gratification, two studies addressing the effortful control sub-theme, two studies addressing the inhibitory control sub-theme, four studies addressing the impulse control sub-theme, one study addressing the impulsivity

Table 5.
The Effect of Mindfulness-Based Practices on Children's Emotion Regulation Skills

| Theme | Sub-Themes | n | Publication Code |
|--------------------|------------------------------------------------------------------|---|------------------------|
| Emotion regulation | Ability to cope with undesired emotions | 5 | M3, M11, M12, M14, M15 |
| | Understanding emotions | 5 | M3, M5, M13, M15, M17 |
| | Being able to accept and tolerate emotions | 3 | M2, M12, M15 |
| | Being able to support oneself and change emotions when necessary | 3 | M13, M15, M17 |
| | Self-acceptance and self-love | 1 | M5 |

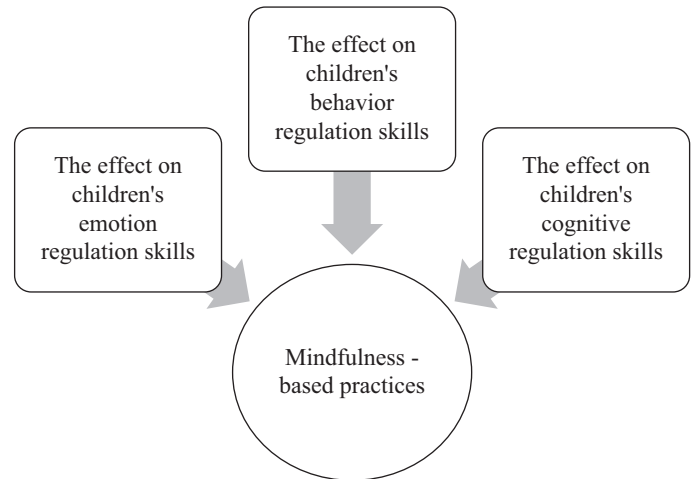


Figure 1.
Themes and Sub-Themes.

sub-theme, two studies addressing the experience orientation sub-theme, and seven studies addressing the prosocial behavior sub-theme were identified. In the examination of the results of the study, it was determined that mindfulness-based programs improved children's self-controlled behavior, positive social behavior development, delay of gratification, impulse control, and inhibitory control skills. For example, in the study coded M1 by Razza, Bergen-Cico, and Raymond (2013), it was determined that the children in the experimental group in the mindfulness yoga program showed improvement in terms of delay of gratification, attention, and inhibitory control. In the study coded M15, Kim et al. (2020) observed that OpenMind-Korea, a conscious mindfulness-based social and emotional learning program, improved the positive social behaviors of children. In the study coded M7, Moreno-Gómez and Cejudo (2018) stated that a social and emotional learning program (MindKinder) reduced the aggressive, hyperactive, and destructive behaviors of children. In the study coded M6, Viglas & Perlman (2017) found that the self-awareness-based education program improved the prosocial behaviors of their children and reduced their hyperactivity. The study showed that mindfulness-based practices positively affect children's behavior regulation skills.

Table 7 summarizes the information about the sub-themes and publication codes formed under the theme of cognitive regulation.

In the examination of Table 7, the effect of mindfulness-based programs on children's cognitive regulation skills is categorized into six sub-themes. It was determined that ten studies addressed the sub-theme of attention regulation, seven studies addressed the sub-theme of executive functions, four studies addressed the sub-theme of functioning memory, two studies addressing the sub-theme of executive attention, one study addressing the sub-theme of thought awareness, and one study addressing the sub-theme of academic performance. The results of the study showed that mindfulness-based practices positively affect children's cognitive regulation skills. In the examination of the studies, Flook, Goldberg et al. (2015) observed that the Mindfulness-Based Kindness Curriculum increased the executive function and

Table 6.
The Effect of Mindfulness-Based Practices on Children's Behavior Regulation Skills

| Theme | Sub-Themes | n | Publication Code |
|---------------------|------------------------|---|-------------------------------|
| Behavior regulation | Prosocial behavior | 7 | M3, M5, M6, M9, M10, M13, M15 |
| | Impulse control | 4 | M6, M7, M12, M14 |
| | Delay of gratification | 2 | M6, M12 |
| | Effortful control | 2 | M12, M10 |
| | Inhibitory control | 2 | M10, M14 |
| | Experience orientation | 2 | M8, M9 |
| | Impulsivity | 1 | M6 |

cognitive flexibility skills of children in the study coded M2. In the study coded M3, Thierry et al. (2016) stated that the mindfulness-based education program improved children's executive function skills and positively affected their cognitive self-regulation. In the study coded M1, Razza, Bergen-Cico & Raymond (2013) found that the attention skills of the children in the intervention group improved in the mindful yoga program. In the study coded M12, Janz et al. (2019) stated that mindfulness-based interventions improve children's executive function and attention skills. In the study coded M16, Lertladaluck, Suppalarkbunlue et al. (2021) stated that a school-based mindfulness program increases the working memory performance of children. All these studies show that mindfulness practices with young children have the potential to support the development of cognitive self-regulation by promoting mindfulness, cognitive flexibility, inhibitory control, and executive functions.

Discussion

In this study, the studies examining the effects of mindfulness-based practices in early childhood, which have attracted attention in recent years and become the subject of more research studies, on children's self-regulation have been analyzed through content analysis.

In the examination of the distribution of the studies by years, it is noteworthy that only two studies were conducted between 2010 and 2015 on the subject, and it was determined that the most studies on the subject were conducted in 2018. Since mindfulness is a relatively new phenomenon, there has been limited research on its presence in early childhood environments and its effects on very young children, educators, and families (Flores, 2016). Mindfulness-based programs, which aim to provide children with exactly the skills they need to develop a greater sense of emotional understanding and self-regulation, even in early childhood, present important clues showing that there has been a growing interest in recent years. It is important to emphasize the positive aspects of bringing these practices into the classroom environment, as encouraging mindfulness in early childhood reveals many positive results, especially for self-regulation development.

Various limitations were identified in the studies examined. In the examination of the national literature, it was determined that the concept of mindfulness, which has been studied for about 10 years, is mostly used in education and psychology, and no research examining the effect of mindfulness-based practices on children's self-regulation in early childhood was found. In the international literature, it is noteworthy that there are few studies examining the effect of mindfulness-based education practices on children's self-regulation. Although there has been an increasing interest in mindfulness-based practices in Türkiye in recent years, preliminary studies on the subject limit our comparison of the results obtained. One of these limitations is related to the sample size of the studies. In the examination of the studies, the sample size of only five includes more than 100 participants (Crooks et al., 2020; Leyland et al., 2018; Lim & Qu, 2017; Viglas & Perlman, 2017; Zelazo

Table 7.
The Effect of Mindfulness-Based Programs on Children's Cognitive Regulation Skills

| Theme | Sub-Themes | n | Publication Code |
|----------------------|----------------------|----|-------------------------------------------|
| Cognitive regulation | Attention regulation | 10 | M1, M2, M4, M6, M7, M8, M9, M11, M12, M14 |
| | Executive functions | 7 | M2, M3, M5, M7, M9, M10, M14 |
| | Working memory | 4 | M9, M13, M16, M17 |
| | Executive attention | 2 | M11, M12 |
| | Thought awareness | 1 | M13 |
| | Academic performance | 1 | M7 |

et al., 2018). It is important to ensure that programs that can be integrated into the classroom environment reach larger groups of children by supporting them with teacher training. Li-Grining et al. (2020), in their pilot study on the integration of classroom practices of mindfulness interventions, stated that teachers participating in training found the awareness program applicable, while mindfulness techniques have the potential to be included in the flow of daily life. It is also beneficial to expand training to include parents to encourage more generalization beyond the classroom environment.

The results obtained from the studies examined showed that mindfulness-based practices improved children's cognitive regulation skills, academic performance, emotional and behavioral regulation, and reduced outward behavioral problems. Studies have reported that mindfulness-based practices mostly support children's sub-skills for coping with undesired emotions and understanding emotions on emotion regulation skills. In the examination of the studies, it is concluded that mindfulness-based training programs improve children's ability to cope with undesired emotions and negative affect (Crooks et al., 2020; Janz et al., 2019; Kim et al., 2020; Thierry et al., 2016; Zelazo et al., 2018). The ability to cope with undesired emotions enables children to develop a positive and healthy mental health and emotional cognition (Bridges et al., 2004). It can support them in regulating negative emotions in positive emotions and stressful situations, coping with them in socially appropriate ways, and achieving their goals (Shin et al., 2023). Studies have found that mindfulness-based practices improve children's ability to understand emotions (Berti & Cigala, 2020; Kim et al., 2020; Poelmann-Tynan et al., 2016; Thierry et al., 2016; Xie et al., 2021). In their study, Kim et al. (2020) stated that young children (3 years old) scored lower in meditation and mindfulness-based activities. Understanding emotions is a second important element of emotional skills, and experiences have a very important place in the development of the ability to understand emotions, and individuals can learn which emotion to form within events through their experiences (Sroufe, 1997). Understanding emotions, empathizing, or coping with emotions requires a certain cognitive maturity; incorporating the practice into daily routines and doing repetitive studies is the key to improving awareness.

In the studies examined, it was found that mindfulness-based programs mostly focused on prosocial behavior and impulse control sub-skills in children's behavior regulation skills. Prosocial behaviors are social behaviors such as sharing, cooperating, and helping voluntarily for the benefit of someone else and are the building blocks of children's development (Eisenberg et al., 2015; Sylva et al., 2020). The level of self-regulation plays an important role in the development of prosocial behavior in early childhood. In the examination of the research studies, it has been revealed that mindfulness-based practices increase the development of children's prosocial behaviors (Berti & Cigala, 2020; Kim et al., 2020; Leyland et al., 2018; Poelmann-Tynan et al., 2016; Viglas & Perlman, 2017; Wood et al., 2018; Thierry et al., 2016).

Children's self-regulation skills have been associated with better sociability (Spinrad et al., 2007) and less extroverted behavioral problems (Haskett et al., 2012). Impulse control is the ability to inhibit the primary response to exhibit secondary dominant behavior. Impulse control contributes to regulating children's behavior. The studies examined revealed that mindfulness-based practices positively support children's impulse control skills (Crooks et al., 2020; Janz et al., 2019; Moreno-Gómez and Cejudo, 2019; Viglas & Perlman, 2017). Children who come to school with impulse control skills can make it easier to sit still, pay attention, remember and follow the rules, wait for their turn, and flexibly evaluate new ideas (Zelazo et al., 2018). Opportunities can be provided for children who have problems coping with stressful situations or suppressing their impulses to access short-term mindfulness-based interventions so that they can start primary school appropriately.

It has been determined that the focus of mindfulness-based education practices in children's cognitive regulation skills is attention regulation and executive function skills. Attention is the ability to regulate behaviors in the face of a certain situation and constitutes a large part of self-regulation (Rueda et al., 2011). In the studies examined in the present study, children were asked to pay attention to their bodies, breath, sensations, and emotions in mindfulness-based practices. When children are asked to focus their attention by noticing the factors that distract them when they are distracted, it has been determined that their working memory improves by keeping in mind the instructions given to children (Flook et al., 2015; Janz et al., 2019; Lertladaluck et al., 2021; Viglas & Pearlman, 2017; Zelazo et al., 2018). An important part of the attention regulation process is the emphasis on executive functions in the relevant literature. Executive functions refer to cognitive processes such as attention, functioning memory, inhibitory control skills, and their effects on planning, problem solving, and goal-oriented actions (Miyake et al., 2000; Willoughby et al., 2012). The results obtained from the studies demonstrated that mindfulness-based practices improve children's attention regulation skills (Crooks et al., 2020; Flook et al., 2015; Janz et al., 2019; Lemberger-Truelove et al., 2018; Lim & Qu, 2017; Moreno-Gómez & Cejudo, 2019; Razza et al., 2013; Viglas & Perlman, 2017; Wood et al., 2018; Zelazo et al., 2018) and positively affect executive function skills (Crooks et al., 2020; Flook et al., 2015; Leyland et al., 2018; Moreno-Gómez & Cejudo, 2019; Poelmann-Tynan et al., 2016; Thierry et al., 2016; Wood et al., 2018). The fact that executive functions can develop at a significant level thanks to behavioral and neural flexibility in early childhood makes mindfulness practices possible in this age period (Diamond & Lee, 2011).

Conclusion and Recommendations

The results of the present study revealed the importance of mindfulness-based programs in developing children's self-regulation. Also, the studies examined provided important results that mindfulness-based training practices can be successfully applied in early childhood. For this reason, in-service training can be provided for teachers on mindfulness training so that teachers can become experts in this field. Also, educational seminars can be organized for families about mindfulness training and practices, and families can be provided with resources to help children do activities at home. It will be beneficial to focus future program development and studies on educating teachers about mindfulness, to support generalization outside the school environment by integrating awareness into the daily program and classroom activities, and to provide mindfulness-based training to parents. The results of this review suggest that teaching mindfulness practices to young children and their caregivers can support young children's self-regulatory development and promote socially and emotionally healthy environments in which this development can occur.

Although the empirical evidence is limited, there may be opportunities for children who have trouble coping with stressful situations or suppressing their impulses to access short-term mindfulness-based interventions to help them regulate their negative emotions and ensure a successful transition to primary school. Studies involving young children are very limited in the literature. However, while empirical evidence on effectiveness in young children is limited, it is vital to advance the field of empirical research as it is clear that the importance of awareness is increasing across all age groups, including children. There is a need for new research that includes processes such as making measurements that include appropriate and comprehensive datasets and monitoring the results in the long term. Gathering empirically solid evidence for the feasibility and acceptability of mindfulness-based programs for children indicates that more studies are needed in the field.

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References

- Akman, B., Şimşek, Z., & Balat, G. (2008). Okul öncesi eğitim alan çocukların davranış problemlerinin anne ve öğretmen değerlendirilmeleri açısından karşılaştırılması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 34, 263–275. <https://dergipark.org.tr/en/download/article-file/87553>
- Aksoy, A. B., & Tozduvan Yarah, K. (2017). Çocukların öz düzenleme becerileri ile oyun becerilerinin cinsiyete göre incelenmesi. *Trakya Üniversitesi Eğitim Fakültesi Dergisi*, 7(2), 442–455. [\[CrossRef\]](#)
- Aras, S. (2015). Promoting self-regulation in early years: Tools of the mind. *Journal of Education and Future*, 8(1), 15–25. <https://dergipark.org.tr/en/pub/bjef/issue/18640/196739>
- Atalay, A. (2020). *Mindfulness (bilinçli farkındalık)*. İnkılap Kitabevi.
- Aydın, F., & Ulutaş, İ. (2017). Okul öncesi çocuklarda öz düzenleme becerilerinin gelişimi. *Aksaray Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 1(2), 36–45. <http://aseddergi.aksaray.edu.tr/en/download/article-file/553724>
- Beauregard, M., Paquette, V., & Lévesque, J. (2006). Dysfunction in the neural circuitry of emotional self-regulation in major depressive disorder. *Neuroreport*, 17(8), 843–846. [\[CrossRef\]](#)
- Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development*, 81(1), 326–339. [\[CrossRef\]](#)
- Berti, S., & Cigala, A. (2020). Mindfulness for preschoolers: Effects on prosocial behavior, self-regulation and perspective taking. *Early Education and Development*, 1–20. [\[CrossRef\]](#)
- Bockmann, J. O., & Yu, S. Y. (2022). Using mindfulness-based interventions to support self-regulation in young children: A review of the literature. *Early Childhood Education Journal*, 1–11. [\[CrossRef\]](#)
- Bridges, L. J., Denham, S. A., & Ganiban, J. M. (2004). Definitional issues in emotion regulation research. *Child Development*, 75(2), 340–345. [\[CrossRef\]](#)
- Bronson, M. B. (2019). *Erken Çocuklukta Öz-Düzenleme Doğası ve gelişimi* (S. Esin & M. K. Yiğit, Çev., Ed.). Eğiten Publishing.
- Buckner, J. C., Mezzacappa, E., & Beardslee, W. R. (2009). Self-regulation and its relations to adaptive functioning in low income youths. *American Journal of Orthopsychiatry*, 79(1), 19–30. [\[CrossRef\]](#)

- Burke, C. A. (2009). Mindfulness based approaches with children and adolescents: A preliminary review of current research in an emergent field. *Journal of Child and Family Studies, 23*(2), 133–144. [CrossRef]
- Çihtaş, A. (2011). Eğitimde öz-düzenleme öğretiminin önemi üzerine bir çalışma. *Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 3*(5), 1–11. <https://dergipark.org.tr/en/download/article-file/181751>
- Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools, 41*(5), 537–550. [CrossRef]
- Crooks, C. V., Bax, K., Delaney, A., Kim, H., & Shokoohi, M. (2020). Impact of MindUP among young children: Improvements in behavioral problems, adaptive skills, and executive functioning. *Mindfulness, 11*(10), 2433–2444. [CrossRef]
- Davidson, R. J. (2010). Empirical explorations of mindfulness: Conceptual and methodological conundrums. *Emotion, 10*(1), 8–11. [CrossRef]
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4–12 years old. *Science, 333*, 959–964. [CrossRef]
- Eisenberg, N., Spinrad, T. L., & Knafo-Noam, A. (2015). Prosocial development. In M. E. Lamb & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Socioemotional processes* (pp. 610–656). John Wiley & Sons Inc. [CrossRef]
- Erkan, N. S., & Sop, A. (2018). Analyzing the relationship between parenting styles, behavioural problems and school readiness through the mediating role of self-regulation. *Education and in Science, 43*(196), 27–47. [CrossRef]
- Erol, A., & İvrendi, A. (2018). 4–6 yaş çocuklarına yönelik öz-düzenleme becerileri ölçeğinin geliştirilmesi (Anne formu). *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 44*, 178–195. <https://dergipark.org.tr/en/pub/pau/efd/issue/37689/430918>
- Erwin, E. J., Robinson, K. A., McGrath, G. S., & Harney, C. J. (2017). “It’s Like Breathing In Blue Skies and Breathing Out Stormy Clouds”. *Young Exceptional Children, 20*(2), 69–85. [CrossRef]
- Flook, L., Goldberg, S. B., Pinger, L., & Davidson, R. J. (2015). Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum. *Developmental Psychology, 51*(1), 44–51. [CrossRef]
- Flores, N. (2016). A critical and comprehensive review of mindfulness in the early years. In *Handbook of mindfulness* (pp. 441–446). [CrossRef]
- Haskett, M. E., Stelter, R., Proffit, K., & Nice, R. (2012). Parent emotional expressiveness and children’s self-regulation: Associations with abused children’s school functioning. *Child Abuse and Neglect, 36*(4), 296–307. [CrossRef]
- Janz, P., Dawe, S., & Wylie, M. (2019). Mindfulness-based program embedded within the existing curriculum improves executive functioning and behavior in young children: A waitlist controlled trial. *Frontiers in Psychology, 10*, 2052. [CrossRef]
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144–156. [CrossRef]
- Karaçam, Z. (2013). Sistematik derleme metodolojisi: Sistematik derleme hazırlamak için bir rehber. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi, 6*(1), 26–33. <https://dergipark.org.tr/tr/pub/deuhfed/issue/46815/587078>
- Karremen, A., van Tuijl, C., van Aken, M. A. G., & Deković, M. (2006). Parenting and self-regulation in preschoolers: A meta-analysis. *Infant and Child Development, 15*(6), 561–579. [CrossRef]
- Kim, E., Jackman, M. M., Jo, S. H., Oh, J., Ko, S. Y., McPherson, C. L., Hwang, Y., & Singh, N. N. (2020). Effectiveness of the mindfulness-based Open-Mind-Korea (OM-K) preschool program. *Mindfulness, 11*(4), 1062–1072. [CrossRef]
- Lawlor, M. S., Schonert-Reichl, K. A., Gadermann, A. M., & Zumbo, B. D. (2014). A validation study of the mindful attention awareness scale adapted for children. *Mindfulness, 5*(6), 730–741. [CrossRef]
- Lemberger-Truelove, M. E., Carbonneau, K. J., Atencio, D. J., Zieher, A. K., & Palacios, A. F. (2018). Self-regulatory growth effects for young children participating in a combined social and emotional learning and mindfulness-based intervention. *Journal of Counseling and Development, 96*(3), 289–302. [CrossRef]
- Lertladaluck, K., Suppalarkbunlue, W., Moriguchi, Y., & Chutabhakdikul, N. (2021). School-based mindfulness intervention improves executive functions and self-regulation in preschoolers at risk. *Journal of Behavioral Science, 16*(2), 58–72. <https://so06.tci-thaijo.org/index.php/IJBS/article/view/249238>
- Leyleyland, A., Emerson, L. M., & Rowse, G. (2018). Testing for an effect of a mindfulness induction on child executive functions. *Mindfulness, 9*(6), 1807–1815. [CrossRef]
- Li-Grining, C. P., Vera, E., Janusek, L., Saban, K., Liston, Y., Naqi, Z., & Troske, M. (2021). Project CaLM: A pilot intervention integrating mindfulness strategies into head start classrooms. *Western Journal of Nursing Research, 43*(3), 227–238. [CrossRef]
- Lim, X., & Qu, L. (2017). The effect of single-session mindfulness training on preschool children’s attentional control. *Mindfulness, 8*(2), 300–310. [CrossRef]
- Liman, B., & Tepeli, K. (2017). *A model for early intervention: A self-regulation skills training program for six-year-old preschoolers*. Paper presented at the II. International Academic Research Congress. Alanya Alaaddin Keykubat University, Antalya.
- Maynard, B. R., Solis, M. R., Miller, V. L., & Brendel, K. E. (2017). Mindfulness-based interventions for improving cognition, academic achievement, behavior, and socioemotional functioning of primary and secondary school students. *Campbell Systematic Reviews, 13*(1), 1–144. [CrossRef]
- McClelland, M. M., Acock, A. C., Piccinin, A., Rhea, S. A., & Stallings, M. C. (2013). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly, 28*(2), 314–324. [CrossRef]
- McClelland, M. M., & Cameron, C. E. (2012). Self-regulation in early childhood: Improving conceptual clarity and developing ecologically valid measures. *Child Development Perspectives, 6*(2), 136–142. [CrossRef]
- Merriam, S. B. (2018). *Nitel araştırma desen ve uygulama için bir rehber* (S. Turan, Çev.). Nobel Akademik Yayıncılık.
- Miles, M. B., & Huberman, A. M. (1994). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 428–444). Sage Publications, Inc.
- Mindfulness institute (2022). *Mindfulness-Based Stress Reduction Program (MBSR)*. <https://mindfulnessinstitute.com/tr/>
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex “frontal lobe” tasks: A latent variable analysis. *Cognitive Psychology, 41*(1), 49–100. [CrossRef]
- Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood. *Developmental Psychology, 52*(11), 1744–1762. [CrossRef]
- Moreno-Gómez, A. J., & Cejudo, J. (2018). Effectiveness of a mindfulness-based social-emotional learning program on psychosocial adjustment and neuropsychological maturity in kindergarten children. *Mindfulness, 10*(1), 111–121. [CrossRef]
- Poehlmann-Tynan, J., Vigna, A. B., Weymouth, L. A., Gerstein, E. D., Burnson, C., Zabransky, M., Lee, P., & Zahn-Waxler, C. (2016). A pilot study of contemplative practices with economically disadvantaged preschoolers: Children’s empathic and self-regulatory behaviors. *Mindfulness, 7*(1), 46–58. [CrossRef]
- Razza, R. A., Bergen-Cico, D., & Raymond, K. (2015). Enhancing preschoolers’ self-regulation via mindful yoga. *Journal of Child and Family Studies, 24*(2), 372–385. [CrossRef]
- Rueda, M. R., Posner, M. I., & Rothbart, M. K. (2011). Attentional control and self-regulation. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2. edn, pp. 285–299). Guilford.
- Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental Psychology, 51*(1), 52–66. [CrossRef]
- Şepitci, M. (2018). *Examination of the relationship between self-regulation skills and school adjustment of 5–6-year-old children attending preschool education institutions* (Unpublished Master Thesis). Gazi Üniversitesi.
- Shin, E., Smith, C. L., Devine, D., Day, K. L., & Dunsmore, J. C. (2023). Predicting preschool children’s self-regulation from positive emotion: The moderating role of parental positive emotion socialization. *Early Childhood Research Quarterly, 62*, 53–63. [CrossRef]
- Spinrad, T. L., Eisenberg, N., Gaertner, B., Popp, T., Smith, C. L., Kupfer, A., Greving, K., Liew, J., & Hofer, C. (2007). Relations of maternal

- socialization and toddlers' effortful control to children's adjustment and social competence. *Developmental Psychology*, 43(5), 1170–1186. [\[CrossRef\]](#)
- Sroufe, L. A. (1997). *Emotional development: The organization of emotional life in the early years*. Cambridge University.
- Sylva, K., Sammons, P., Melhuish, E. C., Siraj, I., & Taggart, B. (2020). Developing 21st century skills in early childhood: The contribution of process quality to self-regulation and pro-social behaviour. *Zeitschrift für Erziehungswissenschaft*, 23(3), 465–484. [\[CrossRef\]](#)
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews. Neuroscience*, 16(4), 213–225. [\[CrossRef\]](#)
- Thierry, K. L., Bryant, H. L., Nobles, S. S., & Norris, K. S. (2016). Two-year impact of a mindfulness-based program on preschoolers' self-regulation and academic performance. *Early Education and Development*, 27(6), 805–821. [\[CrossRef\]](#)
- Viglas, M. (2015). *Benefits of a mindfulness-based program in early childhood classrooms* (Unpublished Doctoral Dissertation). Toronto University.
- Viglas, M., & Perlman, M. (2018). Effects of a mindfulness-based program on young children's self-regulation, prosocial behavior and hyperactivity. *Journal of Child and Family Studies*, 27(4), 1150–1161. [\[CrossRef\]](#)
- Willenbrink, J. B. (2018). *Effect of a mindfulness-based program on children's social skills, problem behavior, an emotion regulation* (Unpublished Doctoral Dissertation). The University of Wisconsin Educational.
- Willoughby, M. T., Blair, C. B., Wirth, R. J., & Greenberg, M. (2012). The measurement of executive function at age 5: Psychometric properties and relationship to academic achievement. *Psychological Assessment*, 24(1), 226–239. [\[CrossRef\]](#)
- Wood, L., Roach, A. T., Kearney, M. A., & Zabeck, F. (2018). Enhancing executive function skills in preschoolers through a mindfulness-based intervention: A randomized, controlled pilot study. *Psychology in the Schools*, 55(6), 644–660. [\[CrossRef\]](#)
- Xie, S., Wu, D. D., Yang, J. F., Luo, J. T., Chang, C. Q., & Li, H. (2021). An FNIRS examination of executive function in bilingual young children. *International Journal of Bilingualism*, 25(3), 516–530. [\[CrossRef\]](#)
- Yıldızhan, Ö. (2019). *Effect of mindfulness based anger management program on mindfulness and anger management skills on children* (Unpublished Master Thesis). Bahçeşehir University.
- Zelazo, P. D., Forston, J. L., Masten, A. S., & Carlson, S. M. (2018). Mindfulness plus reflection training: Effects on executive function in early childhood. *Frontiers in Psychology*, 9, 208. [\[CrossRef\]](#)
- Zelazo, P. D., & Lyons, K. E. (2012). The potential benefits of mindfulness training in early childhood: A developmental social cognitive neuroscience perspective. *Child Development Perspectives*, 6(2), 154–160. [\[CrossRef\]](#)
- Zenner, C., Herrnleben-Kurz, S., & Walach, H. (2014). Mindfulness based interventions in schools - A systematic review and meta-analysis. *Frontiers in Psychology*, 5, 603. [\[CrossRef\]](#)
- Zimmermann, E. K. (2018). *Now-Notice with Open Wonder: A mindfulness-based program for children ages 4–5 years* (Unpublished Doctoral Dissertation). The Chicago School of Professional Psychology.