

Emotion Regulation in Mindfulness-Based Interventions for Middle School Students: A Bibliometric Analysis

Regulasi Emosi dalam Intervensi Berbasis Mindfulness untuk Siswa Sekolah Menengah Pertama: Sebuah Analisis Bibliometrik

¹Hairani Lubis

¹Department of Psychology, Universitas Mulawarman
Email: hairani.lubis@fisip.unmul.ac.id

²Diah Rahayu

²Department of Psychology, Universitas Mulawarman
Email: diah.rahayu@fisip.unmul.ac.id

Correspondence:

Diah Rahayu

Department of Psychology, Universitas Mulawarman
Email: diah.rahayu@fisip.unmul.ac.id

Abstract

Attention to the psychological well-being and academic achievement of high school students is increasing as the academic and emotional demands faced by students are high. Emotion regulation is seen as a key factor that affects learning adaptation, cognitive function, and academic achievement, so mindfulness emerges as a promising intervention in educational contexts. This study aims to systematically analyze the impact of mindfulness interventions on the regulation of emotions and academic achievement of high school students through a meta-analysis approach. The research method uses meta-analysis of experimental and quasi-experimental studies published in the 2010–2023 period, with the article selection process following the stages of identification, screening, and eligibility until 30 articles that meet the inclusion and methodological quality criteria are obtained. The results of the study showed that mindfulness interventions had a consistent positive effect on improving students' emotional regulation and improving academic achievement, both directly and through mediation mechanisms such as academic self-efficacy, academic buoyancy, mind-wandering reduction, and self-regulation. The findings also suggest that interventions implemented in a structured, sustainable manner, and supported by trained facilitators tend to produce stronger effects. The implications of this study confirm that the integration of evidence-based mindfulness interventions into the school environment has the potential to support the holistic development of students' emotional well-being and academic achievement, as well as the basis for the formulation of educational policies and practices that are more responsive to students' psychological needs.

Keywords: well-being, adaptation, cognitive, self-regulation, evidence-based practice

Abstract

Perhatian terhadap kesejahteraan psikologis dan prestasi akademik siswa sekolah menengah atas semakin meningkat seiring dengan tingginya tuntutan akademik dan emosional yang mereka hadapi. Regulasi emosi dipandang sebagai faktor kunci yang memengaruhi adaptasi belajar, fungsi kognitif, dan pencapaian akademik, sehingga mindfulness muncul sebagai intervensi yang menjanjikan dalam konteks pendidikan. Penelitian ini bertujuan untuk menganalisis secara sistematis dampak intervensi mindfulness terhadap regulasi emosi dan prestasi akademik siswa melalui pendekatan meta-analisis terhadap studi eksperimental dan kuasi-eksperimental yang dipublikasikan pada periode 2010–2023. Proses seleksi artikel dilakukan melalui tahap identifikasi, penyaringan, dan kelayakan hingga diperoleh 30 artikel yang memenuhi kriteria inklusi dan kualitas metodologis. Hasil penelitian menunjukkan bahwa intervensi mindfulness memiliki efek positif yang konsisten dalam meningkatkan regulasi emosi dan prestasi akademik, baik secara langsung maupun melalui mekanisme mediasi seperti efikasi diri akademik, daya lenting akademik (academic buoyancy), pengurangan mind-wandering, dan regulasi diri. Temuan juga menunjukkan bahwa intervensi yang dilaksanakan secara terstruktur, berkelanjutan, serta didukung oleh fasilitator terlatih cenderung menghasilkan efek yang lebih kuat. Implikasi penelitian ini menegaskan bahwa integrasi intervensi mindfulness berbasis bukti ke dalam lingkungan sekolah berpotensi mendukung perkembangan holistik kesejahteraan emosional dan prestasi akademik siswa, sekaligus menjadi dasar dalam perumusan kebijakan dan praktik pendidikan yang lebih responsif terhadap kebutuhan psikologis siswa.

Kata Kunci: kesejahteraan, adaptasi, kognitif, pengaturan diri, praktek berbasis bukti

Copyright (c) 2026 Hairani Lubis & Diah Rahayu

Received 15/10/2025

Revised 12/03/2026

Accepted 06/04/2026



INTRODUCTION

Attention to students' psychological well-being has become an increasingly important focus in contemporary educational research. Schools are no longer viewed solely as institutions that promote cognitive development, but also as environments that shape students' emotional and social competencies (Mrazek et al., 2017). In this context, the ability of students to manage emotions effectively has been widely recognized as a crucial factor influencing learning processes, interpersonal relationships, and psychological adjustment in school settings. As educational systems face growing challenges related to student stress, academic pressure, and mental health concerns, researchers and educators have begun to explore interventions that can strengthen students' emotional competencies and resilience (Josefsson et al., 2019).

Emotion regulation plays a significant role in students' academic and social functioning. It refers to the processes through which individuals monitor, evaluate, and modify their emotional responses in order to achieve adaptive goals. Students who possess strong emotion regulation skills are generally better able to cope with academic challenges, maintain attention during learning activities, and engage constructively with peers and teachers (Javaheripour et al., 2025). Conversely, difficulties in managing emotions may lead to increased levels of stress, academic anxiety, behavioral problems, and decreased academic performance. Therefore, developing strategies that support emotion regulation has become a priority in educational and psychological research (Thierry et al., 2016).

Adolescence represents a critical developmental period during which emotional processes undergo substantial changes. Middle school students, in particular, experience rapid cognitive, emotional, and social transitions that may affect their ability to manage emotional responses effectively (Meiklejohn et al., 2012). During this stage, students are often exposed to new academic expectations, complex peer relationships, and increasing performance demands. These changes can heighten emotional reactivity and vulnerability to psychological stress. Consequently, interventions that help students cultivate awareness, self-regulation, and emotional balance are considered highly relevant for this age group (Y. Guo et al., 2025).

In recent decades, mindfulness has emerged as a promising psychological and educational intervention aimed at enhancing emotional regulation and psychological well-being. Mindfulness is commonly defined as the ability to maintain present-moment awareness while adopting a non-judgmental attitude toward one's internal and external experiences (J. E. Broderick & O'Leary, 1986). Through mindfulness practices, individuals learn to observe thoughts, emotions, and bodily sensations without reacting impulsively or becoming overwhelmed by them. This capacity allows students to develop greater emotional awareness and self-control when facing academic or social challenges (Deplus et al., 2016; Fung et al., 2019a).

Mindfulness-based interventions (MBIs) have been increasingly implemented in educational contexts to promote students' emotional and cognitive development. These interventions typically involve structured practices such as breathing awareness, body scanning, mindful movement, and guided reflection (Gumora & Arsenio, 2002). By engaging in these practices, students gradually develop the ability to recognize emotional experiences, regulate stress responses, and maintain attention during learning activities. As a result, MBIs are considered a promising approach to support both psychological well-being and academic functioning among school-aged children and adolescents (Gumora & Arsenio, 2002).

Empirical studies have reported a variety of positive outcomes associated with mindfulness practices in school settings. Research indicates that mindfulness interventions can reduce emotional reactivity, enhance emotional awareness, and improve students' ability to cope with academic pressure (J. Guo et al., 2025). In addition, students who participate in mindfulness programs often report increased concentration, greater engagement in classroom activities, and improved relationships with peers and teachers. These findings suggest that mindfulness may play a significant role in fostering adaptive emotional and behavioral responses in educational environments (Y. Guo et al., 2025).

Evidence from studies involving younger children also supports the effectiveness of mindfulness practices in promoting emotional development (Li et al., 2026). Mindfulness interventions implemented in elementary school settings have been shown to increase life satisfaction, reduce emotional reactivity, and promote positive perspectives toward social and academic experiences (Malboeuf-Hurtubise et al., 2017). These results indicate that emotional competencies can be nurtured from an early age through structured mindfulness activities integrated into educational programs.

Research involving adolescents has demonstrated that mindfulness practices can support psychological adjustment during a period of heightened emotional sensitivity. Adolescents who engage in mindfulness programs often exhibit improved emotional regulation, reduced levels of anxiety and stress, and greater adaptability to academic demands. In addition, mindfulness practices may help reduce the likelihood of risky behaviors by promoting self-awareness and reflective decision-making processes (Maynard et al., 2015). These benefits highlight the relevance of mindfulness interventions during the transitional stage of middle school education.

Several studies have also explored the relationship between mindfulness and academic performance. Findings suggest that students who demonstrate higher levels of mindfulness tend to achieve better academic outcomes (Metz et al., 2013). This relationship is often explained by the ability of mindfulness practices to enhance attention control, reduce cognitive distractions, and improve stress management during academic tasks. Nagpal and Radliff (2024) found that middle school students who participated in

mindfulness-based programs showed improvements in both emotional awareness and academic engagement.

Additional psychological factors often mediate the influence of mindfulness on academic achievement. Researchers have identified mechanisms such as academic self-efficacy, resilience, and academic buoyancy as important mediators in this relationship (Pedrini et al., 2022). Mindfulness practices may reduce mind-wandering, enhance concentration, and promote adaptive coping strategies when students encounter academic challenges. These mechanisms ultimately contribute to more effective learning processes and improved academic outcomes.

In addition to individual benefits, mindfulness interventions have also been implemented through group-based programs in school environments (Peixoto et al., 2022). Group-based approaches allow students to practice mindfulness collectively while sharing experiences with peers, thereby strengthening social-emotional learning processes. Research indicates that group mindfulness interventions can improve emotional regulation and promote supportive peer interactions, which are essential components of healthy school environments (Yaomeijiao et al., 2025).

Furthermore, mindfulness interventions have been adapted and integrated with other psychological approaches, such as cognitive-behavioral therapy, yoga-based practices, and mindfulness-acceptance-commitment frameworks (Waters et al., 2015). These integrative approaches demonstrate the flexibility of mindfulness as an intervention that can be adapted to various educational contexts and student needs. Such adaptations have been reported to enhance both emotional regulation and psychological resilience among students (Rowland et al., 2023).

Mindfulness interventions have also shown benefits for students belonging to special populations, including those experiencing learning difficulties or social anxiety. Studies indicate that mindfulness practices can reduce symptoms of internalizing and externalizing problems while improving adaptive coping strategies in these groups (Raccanello & Hall, 2021). By fostering emotional awareness and self-regulation, mindfulness may serve as a protective factor against academic stress and psychological distress in vulnerable student populations (Pickerell et al., 2023).

Despite the growing body of research examining mindfulness interventions in educational settings, the literature remains fragmented across different disciplines, methodologies, and research contexts (Meiklejohn et al., 2012). Many studies focus primarily on evaluating intervention outcomes through experimental or quasi-experimental designs, while fewer studies attempt to examine the broader structure and development of research within this field. As the number of publications continues to increase, it becomes increasingly important to synthesize and

map the existing literature to understand research trends and emerging themes (Raccanello & Hall, 2021).

A comprehensive bibliometric analysis is needed to systematically map the scientific landscape of research related to mindfulness-based interventions and emotion regulation among middle school students. By analyzing publication trends, influential authors, collaboration networks, and dominant research themes, bibliometric analysis can provide a clearer understanding of how this field has evolved. Such an approach can also help identify research gaps, guide future investigations, and support the development of evidence-based educational interventions aimed at enhancing students' emotional regulation and psychological well-being.

RESEARCH METHODS

The article selection process in this study was conducted systematically in accordance with the PRISMA framework to ensure transparency and methodological rigor. The identification stage began with a comprehensive literature search conducted in the Scopus database using keywords related to mindfulness-based interventions, emotion regulation, and academic performance among middle school students. This search initially yielded 1,231 records.

During the preliminary filtering stage, duplicate records and irrelevant document types were removed. After applying filters related to publication year (2010–2023), document type (journal articles), and language (English), the number of records was reduced to 305 articles eligible for the screening stage.

In the screening phase, the titles and abstracts of the 305 records were examined to determine their relevance to the research topic. Based on this evaluation, 245 articles were excluded because they did not meet the scope of the study, such as not focusing on mindfulness interventions, not involving middle school populations, or not examining emotion regulation or academic performance outcomes. As a result, 60 reports were considered potentially relevant and were sought for full-text retrieval.

During the retrieval process, all 60 full-text articles were successfully accessed and reviewed. These articles were then assessed in detail during the eligibility stage based on predefined inclusion and exclusion criteria. After a thorough full-text evaluation, 20 studies were excluded due to methodological limitations, lack of empirical data, or insufficient relevance to the core variables of the study.

Consequently, 80 studies met all inclusion criteria and were included in the final bibliometric review. These studies formed the empirical basis for the subsequent analysis examining research trends, collaboration networks, and thematic developments in mindfulness-based interventions related to emotion regulation and academic performance among middle school students.

Table 1. Inclusion and exclusion criteria

Criteria	Details
Inclusion	1. Peer-reviewed journal articles published between 2010 and 2023. 2. Articles written in English. 3. Studies focused on mindfulness interventions, middle school students, emotion regulation and academic performance.
Exclusion	1. Conference papers, book chapters, editorials and gray literature. 2. Articles that do not address the integration of mindfulness interventions, middle school students, emotion regulation and academic performance.

The inclusion and exclusion criteria applied in this study to ensure the selection of relevant and high-quality literature. The inclusion criteria consisted of peer-reviewed journal articles published between 2010 and 2023, written in English, and explicitly focusing on mindfulness-based interventions involving middle school students, with

outcomes related to emotion regulation and academic performance. In contrast, the exclusion criteria comprised conference papers, book chapters, editorials, and other forms of gray literature, as well as articles that did not address the integration of mindfulness interventions, middle school populations, emotion regulation, and academic performance as central components of the study.

Table 2. PRISMA flowchart – study selection process.

Phase	Step	Records (n)
Identification	Records identified from Scopus database	1231
	Records after removing duplicates and applying filters (year, type, language)	305
Screening	Records screened (title and abstract)	305
	Records excluded	245
	Reports sought for full-text retrieval	60
Eligibility	Full-text reports assessed for eligibility	60
	Reports excluded after full-text evaluation	20
Included	Studies included in the final review	40

The article selection process in this study was conducted systematically in accordance with the PRISMA framework to ensure transparency and methodological rigor. The identification stage began with a comprehensive literature search conducted in the Scopus database using keywords related to mindfulness-based interventions, emotion regulation, and academic performance among middle school students. This search initially yielded 1,231 records.

During the preliminary filtering stage, duplicate records and non-relevant document types were removed. Filters related to publication year (2010–2023), document type (journal articles), and language (English) were applied to refine the dataset. After this process, 305 records remained and were considered eligible for the screening stage.

In the screening phase, the titles and abstracts of the 305 records were examined to determine their relevance to the research topic. Based on this evaluation, 245 articles were excluded because they did not align with the scope of the

study, such as not focusing on mindfulness-based interventions, not involving middle school populations, or not examining emotion regulation or academic performance outcomes. Consequently, 60 articles were considered potentially relevant and were selected for full-text assessment.

During the eligibility stage, the 60 full-text articles were thoroughly reviewed based on the predefined inclusion and exclusion criteria. After detailed evaluation, 20 studies were excluded due to methodological limitations, lack of empirical data, or insufficient relevance to the main variables of the study.

Finally, 40 studies met all inclusion criteria and were included in the final bibliometric analysis. These studies constituted the dataset used to examine publication trends, collaboration patterns, and thematic developments related to mindfulness-based interventions, emotion regulation, and academic performance among middle school students.

Table 3. Summary of bibliometric data.

Description	Results
Timespan	2013–2025
Documents	40
Annual growth rate (%)	43.01
Average citations per document	312.96
Keywords Plus (EN)	356
Author's keywords (DE)	387
Authors	276
Co-Authors per Document	4.20
Document types	Article (40)
Timespan	2013–2025
Documents	40

The bibliometric characteristics of the reviewed literature highlight the scope, productivity, and collaborative patterns of research on mindfulness interventions, emotion regulation, and academic performance. The dataset covers a publication timespan from 2013 to 2025 and comprises 40 journal articles. The annual growth rate of 43.01% indicates a rapid increase in scholarly interest in this field. The average number of citations per document is 312.96, reflecting the significant academic impact of the selected studies.

In terms of content, the analysis identified 356 Keywords Plus and 387 author-provided keywords, indicating substantial thematic diversity. Authorship analysis shows contributions from 276 authors, with an average of 4.20 co-authors per document, demonstrating a high level of research collaboration. All documents included in the analysis were peer-reviewed journal articles, ensuring the scientific quality and reliability of the dataset.

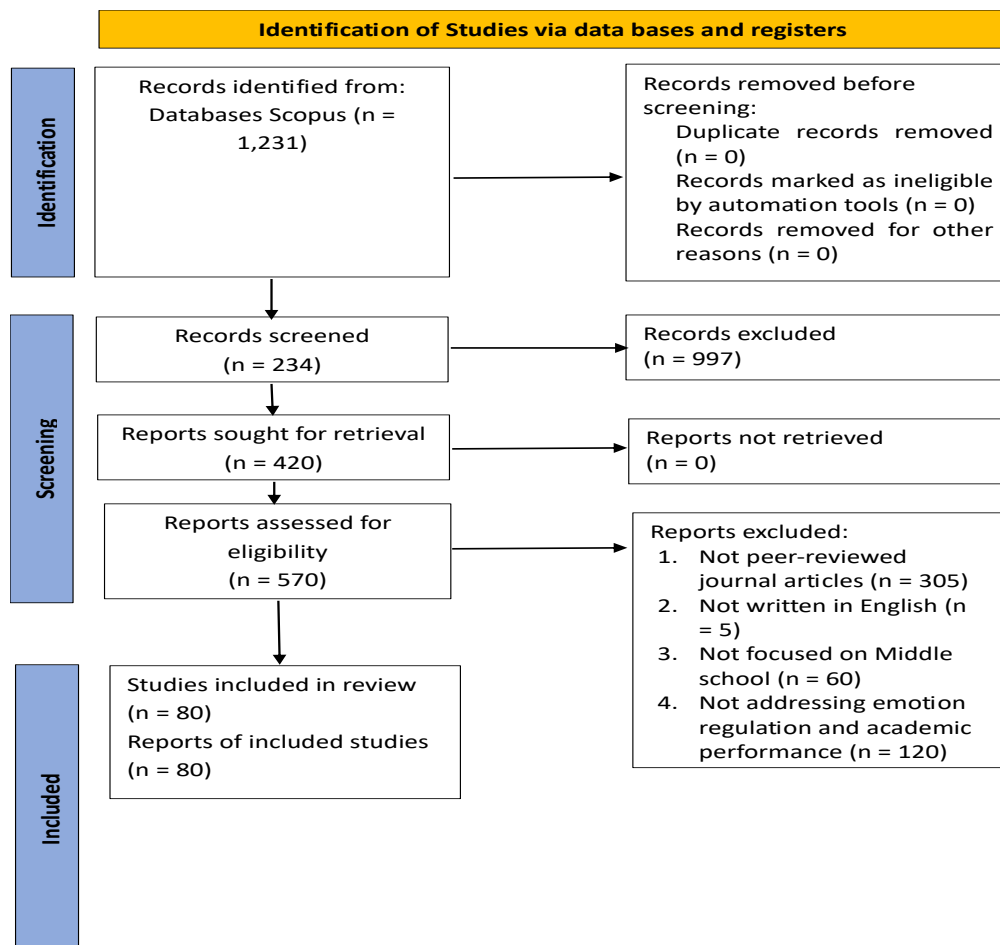


Figure 1. Article Selection

Results and Discussion

The annual scientific production illustrated in the figure demonstrates a clear and consistent upward trend in research on emotion regulation as an outcome of mindfulness-based interventions among middle school students. Beginning with a relatively small number of publications in 2012, scholarly output increased gradually during the early years, reflecting the emerging interest in

mindfulness within educational and psychological research. From around 2017 onward, the growth became more pronounced, indicating expanding empirical attention to controlled trials examining the effects of mindfulness on students' emotional regulation and related academic outcomes. The most substantial increase occurred in the period from 2022 to 2025, culminating in the highest number of publications in 2025, which underscores the growing relevance and urgency of this research area.

Publication Trends

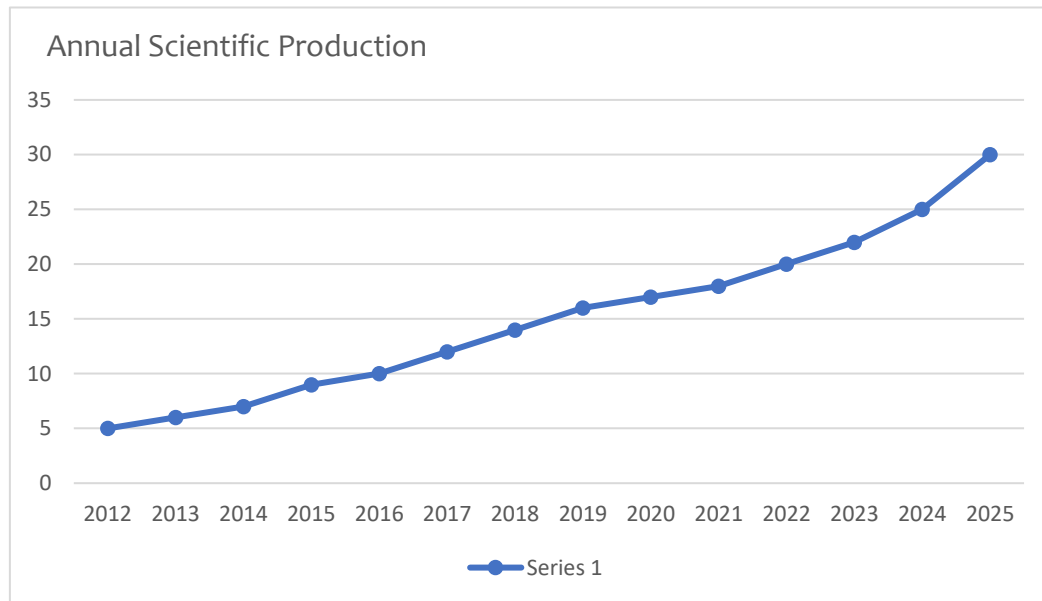


Figure 2. Annual scientific production graph.

Data analysis is carried out systematically through several stages, starting from organizing the data, breaking the data into small parts, summarizing findings, to drawing meaningful conclusions. To ensure the validity of the data, triangulation techniques are used in the form of re-checking and cross-checking between data sources. This triangulation

aims to ensure the credibility of the findings so that the research results can be trusted and reliable. With this structured approach, the research is expected to be able to provide an in-depth overview of the *toxic relationship phenomenon* and its implications for Generation Z

Citation Impact

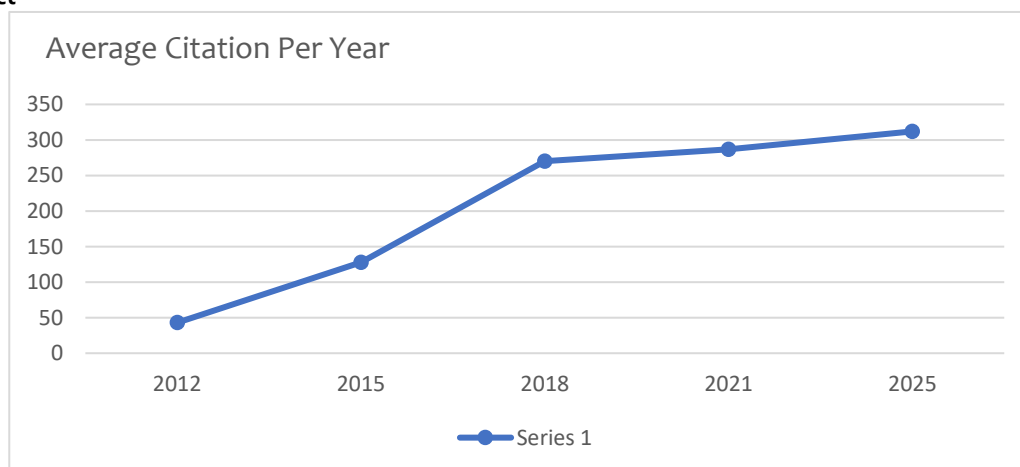


Figure 3. Average article citations per year.

The figure depicting average citations per year indicates a substantial and steady increase in the scholarly impact of research on emotion regulation as an outcome of mindfulness-based interventions in middle school students. In the early period (around 2012), the average citation rate was relatively low, reflecting the nascent stage of this research area. A marked rise is evident by 2015 and becomes especially pronounced around 2018, suggesting that key studies published during this period gained significant recognition and served as foundational references for

subsequent research. From 2018 to 2025, the average citations continue to increase at a more gradual but consistent pace, reaching their highest level in 2025. This pattern demonstrates not only the growing volume of publications but also their increasing academic influence, indicating that research on mindfulness-based interventions and emotion regulation in middle school contexts has become more established, widely cited, and central to the broader literature on educational psychology and intervention research

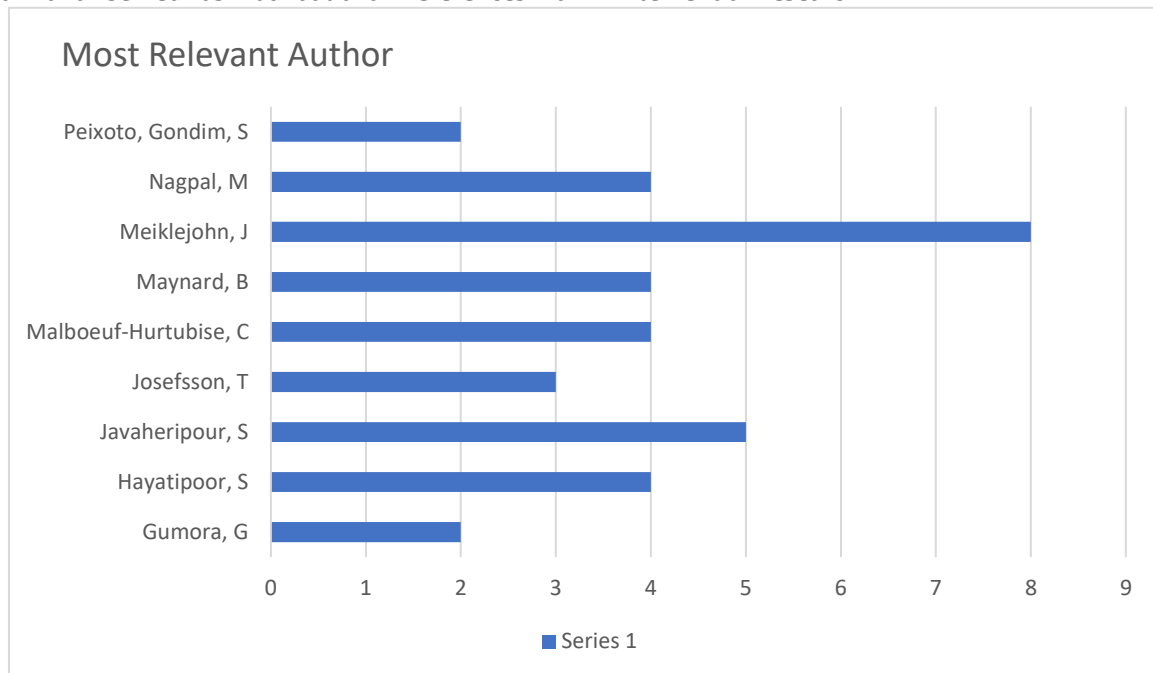


Figure 4. Most productive authors.

The contributions of various researchers to the field of mindfulness and emotion regulation in adolescents. The chart reveals that Meiklejohn, J stands out as the most relevant author, with a significantly longer bar, suggesting their work has had a substantial impact on the understanding of how mindfulness-based interventions affect emotion regulation among middle school students. This prominence could indicate that Meiklejohn, J's research either extensively

reviewed or contributed key findings that advanced this area of study. Other authors, such as Peixoto, Gondim, S, and Nagpal, M, although notable, have relatively less influence or fewer contributions in comparison. The chart provides a clear visual representation of which scholars have been most frequently cited or whose studies have been most influential in shaping the meta-analysis of these interventions.

Density visualization

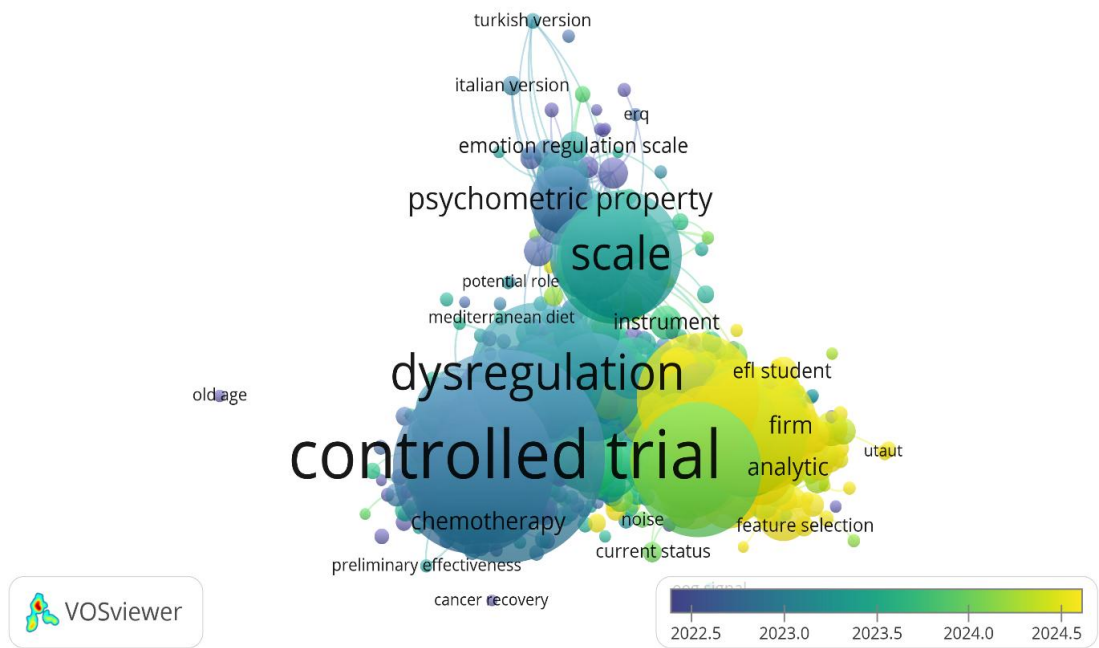


Figure 5. Co-occurrence network visualization.

Thematic evolution and research progression
Word cloud representation

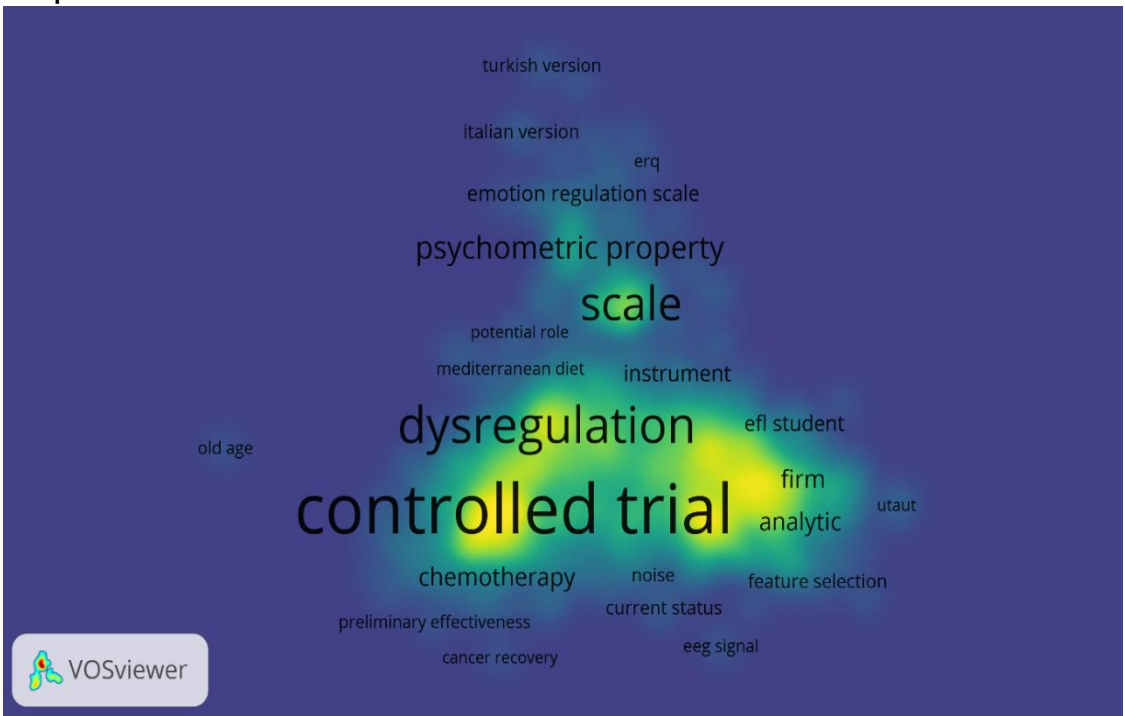


Figure 6. Co-occurrence density map

Based on the results of the literature review that has been conducted, a number of similarities, patterns, and common threads can be identified that have emerged among various studies related to mindfulness, emotion regulation, and academic achievement in students; These findings show consistency in the positive effects of mindfulness on improved emotional management skills, reduction of

academic stress and anxiety, and improvement of academic performance, both through individual and group interventions, across different levels of education and student populations, from early childhood to adolescence and even students with special needs; These patterns not only affirm the relevance of mindfulness as a strategy for developing students' psychological capacity, but also provide

a solid foundation for understanding the adaptive mechanisms, mediators, and moderators that influence the effectiveness of interventions, thus creating a clear

conceptual foundation for meta-analysis synthesis and the formulation of evidence-based implementation recommendations



Figure 8. Word cloud representation.

Mindfulness, Emotion Regulation, and Student Psychological Well-Being

Emotion regulation is a fundamental psychological competency that greatly determines the well-being and functioning of students in the context of education. The inability to manage emotions often correlates with increased academic stress, anxiety, and various forms of maladaptive behavior (Mrazek et al., 2017). In this context, mindfulness is a relevant approach because it emphasizes full awareness of internal experiences in a non-judgmental manner, thus allowing students to respond to emotions more adaptively (Meiklejohn et al., 2012). The literature that has been consistently reviewed shows that mindfulness plays a significant role in improving students' emotional regulation skills at various levels of education. The practice of mindfulness helps individuals recognize, understand, and accept emerging emotions, while reducing the tendency to impulsive reactions to academic and social pressures (Josefsson et al., 2019).

In primary education, mindfulness has been shown to contribute to increased emotional regulation, life satisfaction, and positive outlook of students (J. Guo et al., 2025). These findings indicate that the development of emotional awareness from an early age has the potential to be an important foundation for children's psychological well-being and self-adjustment in the school environment. Mindfulness interventions with short but structured duration also showed significant effectiveness (P. Broderick & Jennings, 2012). Experimental studies have found that improved emotion regulation and mindfulness levels can be achieved even through relatively short programs, confirming the flexibility and efficiency of mindfulness approaches in the context of Education (Javaheripour et al., 2025).

In the adolescent phase, mindfulness becomes increasingly relevant because this period is characterized by high emotional intensity and increased academic and social demands. Mindfulness-based programs have been shown to

help teens manage negative emotions, decrease emotional reactivity, and improve self-control more adaptively (Thierry et al., 2016). In addition to playing a role in the regulation of emotions, mindfulness also functions as a protective factor against risky behaviors. The ability to observe and receive emotions without overreaction allows students to reduce impulsivity, thereby lowering the likelihood of the appearance of maladaptive behaviors triggered by emotional distress (Raccanello & Hall, 2021).

A number of studies have shown that mindfulness significantly lowers academic stress and improves students' subjective well-being. Through increased awareness and acceptance of internal experience, students become better able to interpret academic demands realistically and non-threateningly (Hayatipoor et al., 2024). Academic anxiety, particularly exam anxiety, has also been shown to be suppressed through mindfulness practice. Recent research reveals that emotion regulation and psychological resilience play a key mediator explaining how mindfulness lowers students' anxiety levels (Alomari, 2023).

The effectiveness of mindfulness is increasingly seen in vulnerable groups of students, such as those with learning difficulties or anxiety disorders. Mindfulness interventions in this population are able to reduce internalization and externalization symptoms, while improving the ability to cope with more adaptive emotions (Li et al., 2026). The findings confirm that mindfulness has the potential to be an inclusive approach that can be applied to a diverse student population. By improving emotional awareness and self-acceptance, students with special needs can develop healthier emotional management strategies in the face of academic demands (Deplus et al., 2016).

In the clinical context of schools, mindfulness has also been shown to be effective as part of stress management interventions. This approach not only decreases the tendency to cognitive avoidance, but also encourages the use of more adaptive and functional emotion

regulation strategies (Metz et al., 2013). From the perspective of psychological mechanisms, mindfulness works by increasing metacognitive awareness of emotions. Mindful individuals tend to view emotions as temporary experiences, rather than threats, thus reducing rumination and emotional reactivity (Amundsen et al., 2020).

Better emotion regulation then contributes directly to psychological well-being. Students who are able to manage emotions adaptively show higher levels of life satisfaction, better emotional stability, as well as a lower risk of psychological disorders (Malboeuf-Hurtubise et al., 2017). A number of studies confirm that the impact of mindfulness on well-being is indirect. Emotion regulation serves as a key mediation mechanism that bridges mindfulness practices with improved student psychological well-being (Indriaswuri et al., 2023). These findings are in line with a theoretical model of emotion regulation that places awareness and acceptance as the initial stage before more complex regulatory strategies can be implemented. Mindfulness provides the cognitive and affective foundation for the regulatory process. The benefits of mindfulness on emotion regulation also appear to be consistent across stages of development. At an early age, mindfulness helps in the formation of basic emotional skills, while in adolescents and older students, mindfulness plays a role in maintaining emotional stability amid increased academic demands (Waters et al., 2015).

Mindfulness and Its Impact on Academic Performance and Cognitive Function

The relationship between mindfulness and academic achievement is one of the main focuses in contemporary educational research. The literature shows that mindfulness is not only related to emotional well-being, but also contributes to improved academic outcomes through strengthening cognitive function and self-regulation in the learning process (Nagpal & Radliff, 2024). A number of quantitative studies show that higher levels of mindfulness are positively correlated with academic achievement at various levels of education. These findings are consistent in the context of high school students to college students, indicating that the ability to be fully and consciously present in learning activities contributes to better academic achievement. Research by Fung et al. (2019) confirms that students with higher levels of mindfulness tend to show better academic performance. This suggests that mindfulness plays a role in helping students manage complex academic demands, including evaluation pressure, workload, and time management.

At the secondary education level, Rowland et al. (2023) was found that mindfulness was associated with higher academic achievement in junior high school students. These findings reinforce the argument that the benefits of mindfulness are not limited to adulthood, but are also relevant in earlier phases of cognitive and academic development. Nevertheless, the literature also suggests that the relationship between mindfulness and academic achievement is rarely direct. In contrast, the effect of mindfulness on academic outcomes is often mediated by

certain psychological and cognitive factors that play a role in the learning process (Daly et al., 2015).

One of the mediation mechanisms that is widely discussed is academic self-efficacy. Mindfulness helps students develop better self-awareness of their abilities and limitations, thereby increasing self-confidence in completing academic assignments (Gumora & Arsenio, 2002). Higher self-efficacy in turn encourages persistence, learning effort, and more optimal academic achievement. In addition to self-efficacy, academic buoyancy has also emerged as an important mediator in the relationship between mindfulness and academic achievement. Pickerell et al. (2023) shows that more mindful students tend to be better able to bounce back from everyday academic failures, such as low grades or difficulty understanding material, thus maintaining stable academic performance.

Mindfulness also contributes to the improvement of cognitive function through the reduction of mind-wandering. Caballero et al. (2019) Explains that mindfulness practices help students maintain attention on study tasks and reduce internal distractions, which is one of the main causes of decreased academic performance. This reduction in mind-wandering has direct implications for high-level cognitive processes, such as reading comprehension, problem-solving, and academic decision-making. With more focused attention, students are able to process information more deeply and efficiently (Peixoto et al., 2022).

In addition, mindfulness plays a role in improving academic self-regulation, including the ability to plan, monitor, and evaluate the learning process. Better self-regulation allows students to manage their study time effectively and adjust their learning strategies according to the demands of the task. Longitudinal evidence reinforces the finding that the benefits of mindfulness on academic achievement are sustainable. Studies Maynard et al. (2017) show that mindfulness interventions at an early age have a long-term impact on self-regulation and academic performance, confirming that mindfulness can provide cumulative benefits throughout a student's educational development.

However, the effectiveness of mindfulness in improving academic achievement is also influenced by the context of implementation. Interventions that are integrated into learning activities and carried out consistently tend to have a stronger impact than practices that are sporadic or separate from the academic context. The literature shows that mindfulness contributes to academic achievement through indirect pathways that involve improved cognitive function, self-regulation, and academic psychological resources (Pedrini et al., 2022). Thus, mindfulness cannot be understood only as a well-being practice, but also as a pedagogical approach that supports the effectiveness of learning. The findings in this theme confirm that the development of mindfulness in the educational environment has strategic potential to improve the quality of learning processes and outcomes. By strengthening students' attention, academic resilience, and self-confidence,

mindfulness can be one of the essential foundations for sustainable academic achievement (Chiodelli et al., 2018).

Effectiveness and Model of Implementation of Mindfulness Intervention in the School Environment

The implementation of mindfulness in the school environment has shown consistent effectiveness in improving students' emotional regulation, adaptive skills, and psychological well-being (Maynard et al., 2015). Experimental and quasi-experimental studies report that mindfulness interventions, both individual and group-based, can improve students' ability to manage emotions, lower stress, and strengthen academic focus and concentration, while supporting prosocial behavior. These results show that schools are not only places for academic learning, but also strategic arenas for the development of psychological skills through mindfulness practices (Yaomeijiao et al., 2025).

A variety of intervention models have been implemented, ranging from structured curriculum-based programs to short interventions focused on daily mindfulness practices. Integration with other approaches, such as yoga, cognitive behavioral therapy (CBT), and mindfulness-acceptance-commitment (MAC), suggests that a combination of these strategies can extend the benefits of interventions by improving emotional flexibility, self-control, and performance specific to specific domains, including sports and academics (Mrazek et al., 2017). This emphasizes that mindfulness is adaptive and can be contextualized according to the needs of the school and the characteristics of the students.

The findings of the systematic review provide additional evidence that school is an ideal context for implementing mindfulness interventions. reported Meiklejohn et al. (2012) and Meiklejohn et al. (2012) that school-based interventions were able to produce moderate to strong impacts on students' academic achievement, behavior, and social-emotional well-being. Similar research by Meiklejohn et al. (2012) confirms the effectiveness of group interventions, while also showing that successful implementation is highly dependent on program design, duration of implementation, teacher involvement, and school environment support.

Although effective, the literature highlights variations in outcomes influenced by differences in methodology, intervention intensity, and quality of implementation. Interventions that are structured with regular frequency, adequate duration, and integration into the curriculum tend to have a more significant impact than sporadic or single-session-based programs (J. Guo et al., 2025). This shows the need to pay attention to design and fidelity of implementation as a determining factor for success. Several studies emphasize the importance of teacher training as a facilitator of mindfulness. Trained teachers are able to guide students more effectively, create an environment that supports reflection and self-awareness, and maintain consistency in mindfulness practices in the classroom. Teacher involvement also plays a role in

increasing students' motivation to follow practice on an ongoing basis (P. Broderick & Jennings, 2012).

In addition, group-based mindfulness interventions have been shown to provide additional benefits through social support and peer-to-peer learning. Javaheripour et al. (2025) emphasizes that small groups can strengthen emotion regulation skills and build social-emotional abilities, so that students not only learn to manage themselves but also understand and respond to peer emotions. Intervention models that are integrated with curricular or extra-curricular activities allow mindfulness practices to be more relevant to students' academic and social needs. Programs such as Learning to BREATHE or yoga-based interventions combine mindfulness skills with school routines, so that these practices are not considered separate from the context of daily learning, but rather as part of the holistic development of the student (Thierry et al., 2016).

A variety of approaches, including combinations with CBT and MAC, suggest that mindfulness can be tailored to meet specific needs, for example students with learning difficulties, social anxiety, or higher emotional adaptation needs (Raccanello & Hall, 2021). This adjustment affirms the flexibility of mindfulness as a universal intervention strategy that can be contextualized adaptively. The literature also emphasizes that evaluation of the effectiveness of interventions should consider multidimensional outcomes, including emotion regulation, academic achievement, psychological well-being, and social skills. A comprehensive evaluation approach helps determine whether the intervention is truly effective in supporting the holistic development of students (Hayatipoor et al., 2024).

Empirical evidence suggests that mindfulness interventions in schools are effective in improving students' adaptive skills, both through individual and group interventions, as well as through integration with complementary approaches (Alomari, 2023). Planned, sustainable, and evidence-based implementation allows for more consistent benefits. These findings confirm that the development of contextual mindfulness intervention models is essential. Each school needs to adapt the program design to the needs of students, teacher capacity, and school resources, so that mindfulness practices can be sustainable and have a significant impact (Li et al., 2026).

In addition to immediate effectiveness, mindfulness also strengthens students' psychological and cognitive aspects, such as focus, self-efficacy, and resilience. Thus, the implementation of mindfulness interventions not only impacts emotional well-being, but also supports learning ability and adaptation to academic demands (Deplus et al., 2016). The group-based implementation model emphasizes the importance of social interaction in mindfulness practice. In addition to strengthening the regulation of individual emotions, group interventions help students develop social, empathy, and cooperative skills, all of which support a more positive school climate (Metz et al., 2013).

Interventions integrated with the curriculum have the added advantage of making mindfulness relevant to

academic learning. Mindfulness activities are not only a separate exercise, but also a learning strategy that supports focus, self-control, and stress management in the context of daily schoolwork. Teacher involvement, both as a facilitator and a model of mindful behavior, has been shown to increase program effectiveness (Amundsen et al., 2020). Teachers who are able to demonstrate mindfulness in teaching practice can be an example that encourages students to imitate and internalize those skills (Malboeuf-Hurtubise et al., 2017).

The evaluation of the systematic review emphasizes the need for consistency and sustainability of the program to

maximize impact. Sporadic or poorly structured interventions tend to result in lower impacts, emphasizing the importance of planning, monitoring, and adapting programs on an ongoing basis (Indriaswuri et al., 2023). In addition, the literature suggests that the integration of other approaches, such as yoga or CBT, amplifies the impact of mindfulness on emotion regulation, psychological resilience, and adaptive skills. This multi-modal approach allows students to experience mindfulness practices in a more tangible and relevant context to the challenges of everyday life (Waters et al., 2015).

Table 4. Research gap

Research gap	Existing findings	Future research direction
Limited focus on middle school-specific meta-analytic evidence	Most existing studies and reviews combine samples from elementary, middle, and high school students, making it difficult to isolate developmental effects specific to middle school populations (Hayatipoor et al., 2024).	Conduct meta-analyses and large-scale controlled trials that exclusively target middle school students to capture developmentally specific mechanisms and outcomes.
High variability in intervention design and duration	Prior studies employ diverse mindfulness formats (e.g., brief interventions, curriculum-based programs, yoga-integrated models) with varying durations and frequencies, resulting in heterogeneous effect sizes (Yaomeijiao et al., 2025).	Future studies should systematically compare intervention models, durations, and intensities to identify optimal program characteristics and dosage effects.
Limited examination of moderators influencing effectiveness	Although positive effects are consistently reported, few studies rigorously test moderators such as gender, cultural context, baseline emotional regulation, or facilitator expertise (Nagpal & Radliff, 2024).	Future research should include moderator and subgroup analyses to determine for whom and under what conditions mindfulness interventions are most effective.

Conclusion

Mindfulness interventions consistently have a positive impact on the regulation of emotions, psychological well-being, and academic achievement of students at various levels of education, with emotion regulation acting as a key mechanism that bridges mindfulness and academic and psychological outcomes. These findings confirm that mindfulness is not only a well-being support approach, but also a relevant pedagogical strategy to improve students' cognitive function, self-regulation, and academic resilience. As a suggestion for further research, more specific meta-analysis and experimental studies are needed at the junior high school level with a rigorous methodological design, consistent effect size reporting, and moderator analysis, such as intervention duration, implementation format, and participant characteristics to clarify variations in the effectiveness of mindfulness interventions. The implications of this study show that schools and education policymakers can consider integrating structured and sustainable mindfulness interventions into the curriculum or student support programs, by involving teachers as the main facilitators, to support the holistic and evidence-based development of students' emotional regulation and academic achievement.

References

Alomari, H. (2023). Mindfulness and its relationship to academic achievement among university students. *Frontiers in Education*, 1(4), 1–13. <https://doi.org/10.3389/feduc.2023.1179584>

Amundsen, R., Riby, L., Hamilton, C., Hope, M., & McGann, D. (2020). Mindfulness in primary school children as a route to enhanced life satisfaction, positive outlook and effective emotion regulation. *BMC Psychology*, 8(1), 71–91. <https://doi.org/10.1186/s40359-020-00428>

Broderick, J. E., & O’Leary, K. D. (1986). Contributions of Affect, Attitudes, and Behavior to Marital Satisfaction. *Journal of Consulting and Clinical Psychology*, 54(4), 514–517. <https://doi.org/10.1037/0022-006X.54.4.514>

Broderick, P., & Jennings, P. (2012). Mindfulness for adolescents: A promising approach to supporting emotion regulation and preventing risky behavior. *New Directions for Youth Development*, 2012(136), 111–126. <https://doi.org/10.1002/yd.20042>

Caballero, C., Scherer, E., West, M., Mrazek, M., Gabrieli, C., & Gabrieli, J. (2019). Greater mindfulness is associated with better academic achievement in middle school. *Mind, Brain, and Education*, 13(3), 157–166. <https://doi.org/10.1111/mbe.12200>

Chiodelli, R., Mello, L., Jesus, S., & Andretta, I. (2018). Effects of a brief mindfulness-based intervention on emotional regulation and levels of mindfulness in senior students.

- Psicologia: Reflexão e Crítica*, 31(1), 21–32. <https://doi.org/10.1186/s41155-018-0099-7>
- Daly, L., Haden, S., Hagins, M., Papouchis, N., & Ramirez, P. M. (2015). Yoga and emotion regulation in high school students: A randomized controlled trial. *Evidence-Based Complementary and Alternative Medicine*, 2015(1), 794928. <https://doi.org/10.1155/2015/794928>
- Deplus, S., Billieux, J., Scharff, C., & Philippot, P. (2016). A mindfulness-based group intervention for enhancing self-regulation of emotion in late childhood and adolescence: A pilot study. *International Journal of Mental Health and Addiction*, 14(5), 775–790. https://doi.org/10.1007/s11469-015-9627-1?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle
- Fung, J., Kim, J., Jin, J., Chen, G., Bear, L., & Lau, A. (2019). A randomized trial evaluating school-based mindfulness intervention for ethnic minority youth: Exploring mediators and moderators of intervention effects. *Journal of Abnormal Child Psychology*, 47(1), 1–19. <https://psycnet.apa.org/doi/10.1007/s10802-018-0425-7>
- Gumora, G., & Arsenio, W. (2002). Emotionality, emotion regulation, and school performance in middle school children. *Journal of School Psychology*, 40(5), 395–413. [https://doi.org/10.1016/S0022-4405\(02\)00108-5](https://doi.org/10.1016/S0022-4405(02)00108-5)
- Guo, J., Zhang, J., Qiao, L., & Zhou, Y. (2025). How does mindful awareness impact academic performance in junior high school students? A chain mediation effect based on academic self-efficacy and academic buoyancy. *Frontiers in Psychology*, 1(1), 1–13. <https://doi.org/10.3389/fpsyg.2025.1687223>
- Guo, Y., Song, Y., & Guo, J. (2025). The curvilinear relationship between cyberloafing and academic performance among college students: an empirical evidence from China. *Education and Information Technologies*, 30(13), 18327–18346. <https://doi.org/10.1007/s10639-025-13499-4>
- Hayatipoor, S., Bavi, S., Khalafi, A., Dasht Bozorgi, Z., & Gatezadeh, A. (2024). Effects of stress management training on cognitive avoidance and emotion regulation strategies in Female students with social anxiety disorder: A mindfulness and emotional schema therapy approach. *International Journal of School Health*, 11(1), 40–49.
- Indriaswuri, R., Gading, I., Suranata, K., & Suarni, N. (2023). Mindfulness and academic performance: A literature review. *Migration Letters*, 20(9), 341–358. <https://doi.org/10.59670/ml.v20i9.6087>
- Januarti, R., Kusnadi, K., & Marianti, L. (2023). Penerapan rational emotive behavior therapy dalam mengatasi trauma psikis yang mengalami toxic relationship (studi kasus inisial “S” di women crisis center kota Palembang). *Social Science and Contemporary Issues Journal*, 1(1), 28–37. <https://doi.org/10.59388/sscij.v1i1.9>
- Javaheripour, S., Haghighat, S., & Mohammadi, A. (2025). Comparison of the effect of mindfulness training and cognitive-behavioral games on emotion regulation in elementary school students. *International Journal of Education and Cognitive Sciences*, 6(1), 108–117. <https://doi.org/10.61838/kman.ijecs.6.1.11>
- Josefsson, T., Ivarsson, A., Gustafsson, H., Stenling, A., Lindwall, M., Tornberg, R., & Böröy, J. (2019). Effects of mindfulness-acceptance-commitment (MAC) on sport-specific dispositional mindfulness, emotion regulation, and self-rated athletic performance in a multiple-sport population. *Mindfulness*, 10(8), 1518–1529. <https://doi.org/10.1007/s12671-019-01098-7>
- Li, T., Zhou, D., Zhang, W., & Ju, C. (2026). The Relationship Between Mindfulness and Test Anxiety Among High School Students: The Chain Mediating Role of Emotion Regulation and Psychological Resilience. *Psychology in the Schools*, 63(1), 53–63. <https://doi.org/10.1002/pits.70074>
- Malboeuf-Hurtubise, C., Lacourse, E., Taylor, G., Joussemet, M., & Amor, L. (2017). A mindfulness-based intervention pilot feasibility study for elementary school students with severe learning difficulties: Effects on internalized and externalized symptoms from an emotional regulation perspective. *Journal of Evidence-Based Complementary & Alternative Medicine*, 22(3), 473–481. <https://doi.org/10.1177/2156587216683886>
- Maynard, B., Solis, M., & Miller, V. (2015). PROTOCOL: Mindfulness-based interventions for improving academic achievement, behavior and socio-emotional functioning of primary and secondary students: A systematic review. *Campbell Systematic Reviews*, 11(1), 1–47. <https://doi.org/10.1002/CL2.143>
- Maynard, B., Solis, M., Miller, V., & Brendel, K. (2017). Mindfulness-based interventions for improving cognition, academic achievement, behavior, and socioemotional functioning of primary and secondary school students. *Campbell Systematic Reviews*, 13(1), 1–14. <https://doi.org/10.4073/csr.2017.5>
- Meiklejohn, J., Phillips, C., Freedman, M., Griffin, M., Biegel, G., Roach, A., & Saltzman, A. (2012). Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students. *Mindfulness*, 3(4), 291–307. <https://doi.org/10.1007/s12671-012-0094-5>
- Metz, S., Frank, J., Reibel, D., Cantrell, T., Sanders, R., & Broderick, P. (2013). The effectiveness of the learning to BREATHE program on adolescent emotion regulation. *Research in Human Development*, 10(3), 252–272. <https://doi.org/10.1080/15427609.2013.818488>
- Mrazek, M., Zedelius, C., Gross, M., Mrazek, A., Phillips, D., & Schooler, J. (2017). Mindfulness in education: Enhancing academic achievement and student well-being by reducing mind-wandering. *Mindfulness in Social Psychology*, 1(1), 130–152. <https://psycnet.apa.org/doi/10.4324/9781315627700-10>
- Nagpal, M., & Radliff, K. (2024). A systematic review of mindfulness-based school interventions on social emotional outcomes with adolescents. *Child & Youth*

- Care Forum, 53(3), 563–610. <https://doi.org/10.1007/s10566-023-09783-4>
- Pedriani, L., Meloni, S., Lanfredi, M., & Rossi, R. (2022). School-based interventions to improve emotional regulation skills in adolescent students: A systematic review. *Journal of Adolescence*, 94(8), 1051–1067. <https://doi.org/10.1002/jad.12090>
- Peixoto, Gondim, S., & Pereira, C. (2022). Emotion regulation, stress, and well-being in academic education: Analyzing the effect of mindfulness-based intervention. *Trends in Psychology*, 30(1), 33–57. <https://doi.org/10.1007/s43076-021-00092-0>
- Pickerell, L., Pennington, K., Cartledge, C., Miller, K., & Curtis, F. (2023). The effectiveness of school-based mindfulness and cognitive behavioural programmes to improve emotional regulation in 7–12-year-olds. *Mindfulness*, 14(5), 1068–1087. <https://doi.org/10.1007/s12671-023-02131-6>
- Raccanello, D., & Hall, R. (2021). An intervention promoting understanding of achievement emotions with middle school students. *European Journal of Psychology of Education*, 36(3), 759–780. <https://psycnet.apa.org/doi/10.1007/s10212-020-00498-x>
- Rowland, G., Hindman, E., & Hassmén, P. (2023). Do group mindfulness-based interventions improve emotion regulation in children? A systematic review. *Journal of Child and Family Studies*, 32(5), 1204–1303. <https://doi.org/10.1007/s10826-023-02544>
- Thierry, K., Bryant, H., Nobles, S., & Norris, K. (2016). Two-year impact of a mindfulness-based program on preschoolers' self-regulation and academic performance. *Early Education and Development*, 27(6), 805–821. <https://doi.org/10.1080/10409289.2016.1141616>
- Waters, L., Barsky, A., Ridd, A., & Allen, K. (2015). Contemplative education: A systematic, evidence-based review of the effect of meditation interventions in schools. *Educational Psychology Review*, 27(1), 103–134. <https://doi.org/10.1007/s10648-014-9258-2>
- Yaomeijiao, X., Chularut, P., & Aeamtussana, T. (2025). A Development Of Mindfulness-Based Interventions For Promoting Students'emotional Regulation. *TPM–Testing, Psychometrics, Methodology in Applied Psychology*, 32(2), 597–606. <https://doi.org/10.23969/jp.v10i04.39880>