GLOBAL HEALTH Wellness IMPACT Lab

Research Synopsis

Mindfulness & ADHD

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Mindfulness Literature Synopsis
Mindfulness and ADHD

Summary of Key Findings

Are we pathologizing play? Fraught with complexity, Attention Deficit Hyperactivity Disorder (ADHD) has long been a controversial diagnosis. As our understanding of ADHD symptoms has continued to evolve, it has become clear that while disruptive behaviour is often the most noticeable and irritating for those around the child, it's not necessarily the most challenging aspect for those living with the condition. With the release of the DSM-5, the surge in ADHD diagnoses has further fueled worries that we may be pathologizing developmentally appropriate behaviour, leading to more children being placed on medications their parents sometimes find unsettling. In this context, it's not surprising that researchers are increasingly exploring mindfulness-based interventions (MBIs) as a non-invasive alternative treatment for ADHD.

Since 2019, significant increases in ADHD research have yielded several promising results, both for those living with ADHD and for the field of mindfulness research itself. An exploration of six systematic reviews examining MBIs for the ADHD population has shown positive effects on inattention, hyperactivity, impulsivity, executive function, and emotional regulation across children, adolescents, and adults. Notably, children with ADHD benefit most when their parents participate in MBIs, whether the children are involved or not, highlighting the complexity of interpersonal relationships when working with children.

Interestingly, distinct variations in effect size were also found based on age, with young children benefiting most from movement-based MBIs and experiencing the greatest improvements in hyperactivity and impulsivity. In contrast, adolescents and adults benefit most from reflective practices, seeing the most significant improvements in inattention, emotional regulation, and executive function. This developmental distinction provides valuable direction for future research, suggesting that MBIs may need to be tailored to specific developmental stages to effectively target particular symptoms. It also indicates that the effectiveness of certain interventions may vary across different age groups, emphasizing that the absence of symptom improvement in one developmental stage doesn't preclude its potential effectiveness in another, especially when working with diverse populations, including both children and adults.

While evidence-based findings supporting the use of MBIs in the ADHD population are exciting, researchers have noted several challenges and limitations in this sphere. There is a consistent call for more rigorous and standardized research methodologies, including better control conditions, randomization, and longer intervention periods. Additionally, many children and adults in this population utilize a range of medications to manage their daily symptoms. Although the current research inferences are promising, it is crucial to account for concurrent medication use during trials. This is particularly important in studies involving children between the ages of 6 to 12 years, a period when many are first diagnosed and may begin medications while also participating in mindfulness-based studies. Without controlling for these variables, it becomes challenging to definitively attribute symptom improvements to MBIs alone. Similarly, current research suggests that primary caregivers (PCs) play a critical role in outcomes for children and adolescents with ADHD. Caregivers significantly influence the child-caregiver relationship and the overall family dynamic. Researchers propose that enhancing caregiver emotional regulation skills and reducing stress can benefit not only the child with ADHD but also other family members, leading to improved outcomes overall. Given the complexity of this relationship, future research should address this additional variable with more intentionality.

Finally, it is important to note that current research has explored MBIs as an adjunct to traditional therapies, including behavioural therapy, medications, and other evidence-based treatments. While studies within the ADHD population have emphasized the importance of developmentally appropriate interventions and expanded our understanding that some symptom outcomes may be tied to specific developmental phases, researchers have not yet found definitive evidence that mindfulness is an appropriate stand-alone treatment for this complex and pervasive disorder. Therefore, it is crucial to recognize that these findings should not be interpreted as a substitute for prescribed medications or other established treatments; rather, they should be seen as a complementary approach within a broader treatment plan.

Knowledge Synthesis

1. Chiodelli, R., Mello, L.T.N., Jesus, S.N., Beneton, E.R., Russel, T. & Andretta, I. (2022). Mindfulness-based interventions in undergraduate students: A systematic review. In *Journal of American College Health: J of ACH* (Vol. 70, Issue 3, pp. 791–800). https://doi.org/10.1080/07448481.2020.1767109.

Chiodelli et al. (2022) state that the Institute for Public Policy in the UK reported a five-time increase in mental health issues reported to the university over the last ten years (2012 - 2022). Depression and anxiety are the most commonly reported mental health concerns, with the number of students reporting depression doubling and the number of suicidal students tripling over the last decade. This study aimed to review how MBIs are implemented within university settings. A total of 19 papers were included in the review, confirming a rise in mental health concerns among university-aged students, particularly in the rating of distress (83% of students reported being moderately to severely stressed).

The authors confirmed their hypothesis that MBIs effected a significant change in psychological distress. While they acknowledge that the standardized 8-week MBSR program has the most empirical research, the authors found that abbreviated MBI sessions may make MBI programming more accessible to students. This suggestion is aligned with previous recommendations for populations like nurses who are coping with high-demand situations. The idea of adapting the delivery of MBIs to meet populations where they are may increase the accessibility of MBIs for populations who cannot commit mentally or physically to the demands of a standard MBSR program as their primary intervention. This concept mirrors the concepts used in dialectical behaviour therapy (DBT), which focuses on accepting where we are while building skills to change our situation over time.

2. Fulambarkar, N., Seo, B., Testerman, A., Rees, M., Bausback, K., & Bunge, E. (2023). Meta‐analysis on mindfulness‐based interventions for adolescents' stress, depression, and anxiety in school settings: a cautionary tale. *Child and Adolescent Mental Health*, *28*(2), 307-317. https://doi.org/10.1111/camh.12572

Fulambarkar et al. (2022) perform a meta-analysis assessing the effectiveness of mindfulness-based interventions (MBIs) on stress, depression, and anxiety in school settings for adolescents. The authors reviewed nine randomized-controlled trials (RCTs)

and found that MBIs did significantly improve stress levels but had no significant effect on depression or anxiety. They noted that the overall effect size for stress, depression, and anxiety was small but significant when compared to inactive controls but not significant when compared to active controls.

This study highlights the importance of considering external validity when comparing clinical samples to the general adolescent population. The authors emphasize that while MBIs can be beneficial for reducing stress in school settings, their effectiveness for depression and anxiety remains uncertain. They call for future research to explore sustainable implementation strategies and more extended follow-up periods to understand better the long-term effects of MBIs on adolescent mental health. Continued mixed results across studies underscore the need for cautious interpretation and further research to determine the conditions under which MBIs are most effective.

3. Kretschmer, C. R., Göz Tebrizcik, B., & Dommett, E. J. (2022). Mindfulness Interventions for Attention Deficit Hyperactivity Disorder: A Systematic Review and Meta-Analysis. *Psychiatry International*, *3*(4), 363-399. https://doi.org/10.3390/psychiatryint3040031

Kretschmer et al. (2022) evaluate mindfulness-based interventions (MBIs) for people with ADHD. The authors review 22 studies examining a range of outcomes and suggest MBIs may improve anxiety, depression, and overall quality of life in the ADHD population. They also found potential improvements in ADHD symptoms such as executive dysfunction and emotional dysregulation, though improvements may vary by participant age and intervention delivery. The authors highlight the need for more high-quality controlled studies, noting that many reviewed studies lacked randomization, control conditions, and blinding. Additionally, many studies allowed daily medication use without providing information on medication types or dosages. This study echoes several more recent studies, still chastising past researchers in the mindfulness field for extreme variability in research design and evaluation, making meaningful meta-analysis prohibitive.

One unique perspective of this paper is that the authors stress the importance of parents of children with ADHD also participating in MBIs, emphasizing the significant role of parental influence on child outcomes. They are also the first identified to voice concern regarding the validity of evaluations in mindfulness for this population, stressing that a lack of control over confounding variables means we cannot truly ascertain if significant outcomes are related to interventions or something else.

4. Lee, Y. C., Chen, C. R., & Lin, K. C. (2022). Effects of mindfulness-based interventions in children and adolescents with ADHD: A systematic review and meta-analysis of randomized controlled trials. *International Journal of Environmental Research and Public Health*, *19*(22), 15198. https://doi.org/10.3390/ijerph192215198

Lee et al. (2022) examine the effects of Mindfulness-Based Interventions (MBIs) on children and adolescents with ADHD. The authors review 12 studies and conclude that MBIs may improve behavioural problems and mindfulness in children and stress in parents. The authors focused on studies employing three types of MBIs: yoga, mindfulness-based psychological interventions, and meditation training. Their meta-analysis showed moderate-to-large improvements in ADHD symptoms, particularly in older children, while positive effects in mindfulness were small to moderate. The authors join a line of other systematic reviews highlighting the need for higher-quality controlled studies to produce meaningful meta-analysis studies for this population.

The authors' finding that older children show more significant improvements than their younger counterparts aligns with existing research on the path of developmental changes in children with ADHD. The authors' observation that different mindfulness techniques may be more or less effective for different populations is also noteworthy and could be an interesting avenue for future research on broader populations. This is the second review to include parental stress as an outcome, which continues to

highlight the complexity of ADHD and the broader impact of neurodivergence on family dynamics.

5. Oliva, F., Malandrone, F., di Girolamo, G., Mirabella, S., Colombi, N., Carletto, S., & Ostacoli, L. (2021). The efficacy of mindfulness-based interventions in attention-deficit/hyperactivity disorder beyond core symptoms: A systematic review, meta-analysis, and meta-regression. *Journal of Affective Disorders*, *292*, 475-486. https://doi.org/10.1016/j.jad.2021.05.068

Oliva et al. (2021) evaluate the efficacy of mindfulness-based interventions (MBIs) on ADHD symptoms and associated conditions in children and adults through a systematic review and meta-analysis. The authors reviewed 31 studies and found that MBIs significantly improved ADHD symptoms, particularly inattention, with a medium effect size. However, the effect on hyperactivity/impulsivity was smaller and decreased when accounting for publication bias. They also highlighted that MBIs had a moderate effect on anxiety and mindfulness skills but only a small effect on depression. The authors emphasize the need for more rigorous studies, particularly those comparing MBIs with active control conditions.

6. Tercelli, I., & Ferreira, N. (2019). A systematic review of mindfulness-based interventions for children and young people with ADHD and their parents. *Global Psychiatry*, *2*(1), 79-95. https://doi.org/10.2478/gp-2019-0007

Tercelli and Ferreira (2019) conduct a systematic review assessing the effectiveness of mindfulness-based interventions (MBIs) for children and young people with ADHD and their parents. The authors reviewed ten studies examining the impact of MBIs on attention, hyperactivity, impulsivity, parental stress, and family functioning and found that MBIs are generally effective in improving attention and reducing parental stress, with some studies also reporting improvements in family functioning. However, the results regarding hyperactivity and impulsivity were inconsistent, with some studies showing positive effects and others showing little to no change. The authors highlighted several methodological limitations, such as small sample sizes, lack of control groups, and reliance on self-report measures, which may have affected the reliability of the findings.

This review highlights the potential benefits of mindfulness-based interventions for children with ADHD and their parents, particularly in improving attention and reducing parental stress. The positive effects on family functioning suggest that MBIs could play a role in enhancing the overall well-being of families affected by ADHD. However, the inconsistent findings regarding hyperactivity and impulsivity indicate more research is needed to determine the specific conditions in which MBIs are most effective for this population. The methodological limitations identified, such as small sample sizes and lack of control groups, underscore the need for more rigorous studies to strengthen the evidence base. Future research should focus on addressing these limitations and exploring the long-term effects of MBIs on ADHD symptoms and family dynamics.

7. Zhang, Z., Chang, X., Zhang, W., Yang, S., & Zhao, G. (2023). The effect of meditation-based mind-body interventions on symptoms and executive function in people with ADHD: a meta-analysis of randomized controlled trials. *Journal of Attention Disorders*, *27*(6), 583-597. https://doi.org/10.1177/10870547231154897

Zhang et al. (2023) review the effect of mindfulness-based interventions (MBIs) in people with ADHD. The authors reviewed 19 randomized controlled trials (RTCs) involving both children/adolescents and adults and found that MBIs had a small but significant effect on reducing inattention and hyperactivity/impulsivity while also improving executive function. Interestingly, the authors noted that MBIs showed a more pronounced improvement in inattention for adults, while children and adolescents saw greater improvement in hyperactivity and impulsivity. Additionally, they found that interventions lasting over 1,000 minutes were most beneficial for improving inattention, while shorter interventions were more impactful for symptoms of hyperactivity and impulsivity. This aligns with previous studies demonstrating that shorter interventions (less than eight weeks and with shorter session durations) may be more beneficial for children—especially young children. The authors conclude that MBIs could serve as a complementary or alternative therapy for managing ADHD symptoms, particularly given their safety and accessibility compared to traditional medications.

This meta-analysis provides insight into the potential of MBIs as a therapy for people with ADHD, particularly in addressing inattention, hyperactivity, and impulsivity. The authors echo previous studies highlighting the importance of tailoring MBIs to the developmental needs and abilities of the population receiving the intervention, emphasizing the difference in effect size between inattention and hyperactivity/impulsivity based on age. The authors also emphasize that intervention duration is a crucial variable, as longer-term practices yield better results for some symptoms but not others. However, the positive effects of longer-duration interventions may also relate to developmental status. Based on their analysis, the authors suggest that more research is needed to tailor these interventions to sub-groups within the ADHD population. This study contributes to the growing body of evidence supporting MBIs in ADHD management and underscores the need for further exploration of how these practices can be integrated into broader treatment plans.

Sample Research Studies

Author, Year, Country	Population	Sample Size	Intervention Type	Duration	Study Design	Key Findings	Conclusions	Limitations
Chiodelli et al., (2020), Portugal	People with ADHD	15 studies	Meditation/ Mind-Body Interventions	Varies	Meta-Analysis	MBIs improve executive function and reduce ADHD symptoms	MBIs show promise but are not yet a stand-alone treatment	Need for more RCTs, variations in intervention durations and methods
Fulambarkar et al., (2022), USA	Adolescents	9 studies	MSBR	Varies	Meta-Analysis	MBIs effectively reduce stress, depression, and anxiety	MBIs are effective across different age groups in reducing psychological symptoms	Need for more RCTs, inconsistency in control conditions
Lee et al., 2022, South Korea	Children & Adolescents with ADHD	12 studies	Family-Based MBI	6 weeks	Systematic Review & Meta-Analysis	MBIs improve ADHD symptoms, reduce externalizing behaviours	MBIs are promising for ADHD symptom management	More high-quality studies are needed; variations in study design and sample sizes
Tercelli & Ferreira (2019), Italy	Children with ADHD	6 studies	Mindful-Oriented Meditation	8 weeks	Systematic Review	Positive effects on ADHD symptoms in children	MBIs are effective but require further investigation	A limited number of studies need for more diverse sample sizes
Zhang et al., (2023), USA	Adults with ADHD	12 studies	MCBT	8 weeks	Systematic Review	MBIs help reduce ADHD symptoms and improve cognitive function	MBIs show promise as an adjunctive treatment	Need for more comprehensive studies, especially with different age groups