

## Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms

Kashish Kumar<sup>1\*</sup>

### ABSTRACT

People who have Attention-Deficit/Hyperactivity Disorder (ADHD) often find it hard to control their behavior and keep their attention. Even though MBIs indicated improvement in executive functions, very brief practices are still unproven. Researchers tested whether a 10-minute mindfulness practice—Five Senses Check-In plus Box Breathing—could make it easier for young adults with ADHD symptoms to perform the Flanker task. Those aged 18 to 35 who had finished Eriksen Flanker at base completed the study and they were assigned to mindfulness (n = 23) or no-training control (n = 23) groups using a random process. Following the original intervention, all individuals carried out a second Flanker block using new response keys. We studied Flanker Interference (as a measure of inhibitory control), accuracy and reaction time (RT). Mindfulness training caused significantly lower interference (–112 ms) and shorter RTs (–150 ms) in the task. Post-tests were more accurate in the control group ( $t(44) = 2.33, p = .024$ ), although there was no difference between groups in interference or RT. Very brief mindfulness did not help increase cognitive abilities, so people with ADHD are advised to train more or for longer periods.

**Keywords:** ADHD, mindfulness, inhibitory control, reaction time, Eriksen Flanker

More people now accept that Attention-Deficit/Hyperactivity issue (ADHD) is a lifelong problem that can affect adults as well as children (Barkley, 2015). Among the DSM-5 TR criteria is a history of hyperactivity, impulsivity or inattention that leads to impairment in daily functioning (American Psychiatric Association [APA], 2022). The ICD-11 (WHO, 2019) lists chronic difficulties in attention and behavioral disinhibition as main symptoms in this condition. People who meet these traits usually struggle with not acting on impulse, planning tasks and lasting attention—all parts of executive function.

### ADHD, attention, and inhibitory control

Modern cognitive models show attention as something complex that consists of executive, sustained and selective sub-processes (Hommel et al., 2019). Keep distractions out and maintain objectives by means of inhibitory control which blocks dominant yet unsuitable actions (Mirabella, 2020). Studies using behavioural testing indicate that adults with ADHD

<sup>1</sup>Student, Amity Institute of Psychology and Allied Sciences Amity University, Noida (Uttar Pradesh) India.

\*Corresponding Author

Received: June 01, 2025; Revision Received: August 05, 2025; Accepted: August 09, 2025

## Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms

take longer to complete tasks like the Eriksen Flanker and Go/No-Go tasks (Senkowski et al., 2023; Heparik et al., 2015).

### Mindfulness and executive functioning

Mindfulness has been linked to better self-control in our minds and it means consciously paying attention to the things we experience right now (Gu et al., 2015). After a number of weeks with Mindfulness-Based Cognitive Therapy (MBCT) or Mindfulness-Based Stress Reduction (MBSR), participants showed considerable improvements in both their skills and ADHD symptoms (Poissant et al., 2019; Kretschmer et al., 2022). From a neurological view, practicing mindfulness increases the brain's ability to pay attention and raises frontal-midline theta activity (Lindsay, 2020; Whitfield et al., 2021).

### Ultra-brief mindfulness interventions

Research has shown that extensive MBIs are more successful, but it is less practical to do ultra-short MBIs for the same results. A single mindfulness session is linked by meta-analytic studies to modest and significant quick improvements in executive control in people with average brains (Yakobi et al., 2021). Yet, research on ADHD often gives conflicting results and the role of dose appears to be very significant (Yakobi et al., 2021). The study helps solve the problem of whether a short mindfulness session can enhance the attention and control abilities of people reporting ADHD.

### Objectives and hypotheses

The following hypotheses were suggested: (a) There would be no difference in Flanker performance between groups at baseline; (b) The mindfulness group would have less Flanker Interference and faster, more accurate responses after the intervention than at baseline; (c) The control group's performance would not improve; and (d) The mindfulness group would perform better in the post-test than the controls.

## METHOD

### Participants

A total of 46 adults were enlisted. In order to be eligible, a person must be between the ages of 18 and 35, (b) have a positive ADHD screening on the Adult ADHD Self-Report Scale (ASRS-5; Ustun et al., 2017), and (c) not be using any psychostimulant medication at the moment. Using a computer-generated list, participants were randomised to either mindfulness (n = 23) or control (n = 23).

### Materials

- **ASRS 5:** On a 5-point Likert scale, the six-item ASRS-5 measures the frequency of symptoms; a score of at least four in the symptomatic range suggests probable ADHD.
- **Eriksen Task Flanker:** A 15-inch monitor with a viewing distance of around 60 cm displayed the stimuli in the centre. There were three versions for each trial: letter, colour, and arrow. Neutral (- - > - -) arrays were equally distributed among congruent (>>>>>>) and incongruent (>>><>) arrays. In response, participants used the following: letter (1 = H/K, 0 = C/S), colour (1 = green/red, 0 = blue/orange), and "←" = left and "→" = right. At the post-test, response keys were remapped. Participants were free to react at their own rate and were advised to do so in accordance with the orientation of the central stimulus in the version they were given

## Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms

(arrow, letter, or colour). After being exposed to all three versions, one participant's performance was averaged for analysis.

### *Intervention*

Instructions for the intervention were shared directly with the mindfulness group. A facilitator led the 10–12-minute exercise by performing two parts: (a) Five Senses Check-In, focusing on sight, hearing, touch, smell and taste for five minutes (sequentially) and (b) Box Breathing, a breathing technique with four seconds inhale, four seconds holding the breath, four seconds exhale and four seconds holding again. Control participants were also placed in a room for 10 minutes, remaining seated without talking or moving.

### *Procedure*

Sessions had a three-phase, one-visit format:

1. Flanker Task pre-test (42 trials).
2. Intervention: Techniques for Mindfulness-(a) Five Senses Check-In (b) Box Breathing
3. Flanker Task (42 trials, remapped keys) is the post-test.

### **Dependent measures and analyses**

- **Flanker Interference** = Reaction Time Incongruent – Reaction Time Congruent.
- **Accuracy** (% of correct across trials).
- **Mean Reaction Time** For correct responses.

Descriptive data were screened for normality. Independent-samples *t* tests compared groups; paired-samples *t* tests assessed within-group changes. Alpha = .05.

## **RESULTS**

On the initial tests, the mindfulness group and the control group didn't differ significantly in Flanker Interference, accuracy or reaction time (all  $|t(44)| < 1.53$ , all  $p \geq .13$ ). Following the 10-minute intervention, both reaction time and Flanker Interference showed no meaningful differences between groups (both  $ps > .21$ ). Control group members were more accurate at identifying faces ( $M = 93.69$ ,  $SD = 10.66$ ) compared to the mindfulness group ( $M = 82.19$ ,  $SD = 21.08$ );  $t(44) = 2.33$ ,  $p = .024$ , Cohen's  $d = 0.69$ .

All within-group paired *t* tests showed no important results in changes from pre- to post-test (all  $ps$  were above 0.067). All in all, practicing a short mindfulness exercise did not appear to improve inhibitory control or attention, unlike what was expected with calm rest.

**Table 1: Pre-Intervention Scores**

<b>Variable</b>	<b>Group</b>	<b>M</b>	<b>SD</b>
Flanker Interference	Experimental	-52.44	825.04
Flanker Interference	Control	354.21	971.16
Accuracy (%)	Experimental	87.37	14.74
Accuracy (%)	Control	90.58	9.59
Reaction Time (ms)	Experimental	1434.68	743.85
Reaction Time (ms)	Control	1806.03	1595.51

## Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms

**Table 2: Post-Intervention Scores**

Variable	Group	M	SD
Flanker Interference	Experimental	59.74	566.63
Flanker Interference	Control	354.21	971.16
Accuracy (%)	Experimental	82.19	21.08
Accuracy (%)	Control	93.69	10.66
Reaction Time (ms)	Experimental	1284.92	489.32
Reaction Time (ms)	Control	1476.76	908.27

**Table 3: Statistical Comparisons**

Variable	t	df	p	Mean Diff	SE Diff	95% CI Lower	95% CI Upper
Flanker Interference	-1.53	44	0.133	-406.65	265.71	-942.16	128.85
Accuracy (%)	-0.875	44	0.386	-3.21	3.67	-10.6	4.18
Reaction Time (ms)	-1.012	44	0.317	-31.35	367.07	-1111.13	368.42

## DISCUSSION

As reported earlier, a short mindfulness session did not help people who self-reported ADHD symptoms improve their ability to pay attention or control impulses (Yakobi et al., 2021).

Though the trajectory of RT and interference trends was as anticipated, results indicated the differences were not very meaningful. The higher test accuracy in the post-test for the controls group suggests either a stronger focus in the control group during the second task or a mindfulness group tendency to make quick decisions but with errors.

### *Interpretation in context*

Reviews of neurotypical participants reveal that one session has a small influence and after completing 8-week MBIs, there is medium to large improvement in executive functions (Yakobi et al., 2021; Poissant et al., 2019; Kretschmer et al., 2022). According to the present findings, persistent training may be needed by individuals with ADHD to make use of parts of the brain responsible for focused attention and inhibition. Findings from neuroimaging studies suggest that frequent mindfulness improves fronto-parietal connections and the activity of the anterior cingulate, changes that probably won't take place after only one exposure (Lindsay, 2020).

### *Limitations and future directions*

Because the study had only a small group of participants and depended on their own reports, its results are not widely generalisable. Upcoming studies must add multi-category outcome measures, make use of repeated mindfulness classes and assess people whose mindfulness difficulties have been scientifically diagnosed.

### *Practical implications*

Adults looking for non-pharmacological methods continue to find accessible mindfulness techniques to be appealing adjuncts. Clinicians should warn patients, though, that consistent, organised practice—rather than isolated exposures—is probably necessary for significant cognitive improvements.

## CONCLUSION

Adults with ADHD symptoms showed no discernible improvement in inhibitory control or attention after a single 10- to 12-minute session that combined Five Senses Check-In and Box Breathing. The results highlight how crucial practice duration is in MBIs and imply that longer procedures could be required to provide quantifiable executive gains in this population.

## REFERENCES

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Barkley, R. A. (2015). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (4th ed.). Guilford Press.
- Barzykowski, K., Wereszczyński, M., Hajdas, S., & Radel, R. (2022). Cognitive inhibition behavioural tasks in online and laboratory settings: Data from Stroop, SART and Eriksen Flanker tasks. *Data in Brief*, *43*, 108398. <https://doi.org/10.1016/j.dib.2022.108398>
- Fosco, W. D., Kofler, M. J., Alderson, R. M., Tarle, S. J., Raiker, J. S., & Sarver, D. E. (2019). Inhibitory control and information processing in ADHD: Comparing the dual-task and performance-adjustment hypotheses. *Journal of Abnormal Child Psychology*, *47*(6), 961–974. <https://doi.org/10.1007/s10802-018-0504-9>
- Geurts, D. E. M., Schellekens, M. P. J., Janssen, L., & Speckens, A. E. M. (2020). Mechanisms of change in mindfulness-based cognitive therapy in adults with ADHD. *Journal of Attention Disorders*, *25*(9), 108705471989686. <https://doi.org/10.1177/1087054719896865>
- Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, *37*, 1–12. <https://doi.org/10.1016/j.cpr.2015.01.006>
- Hepark, S., Janssen, L., de Vries, A., Schoenberg, P. L. A., Donders, R., Kan, C. C., & Speckens, A. E. M. (2015). The efficacy of adapted MBCT on core symptoms and executive functioning in adults with ADHD: A preliminary randomized controlled trial. *Journal of Attention Disorders*, *23*(4), 351–362. <https://doi.org/10.1177/1087054715613587>
- Hommel, B., Chapman, C. S., Cisek, P., Neyedli, H. F., Song, J.-H., & Welsh, T. N. (2019). No one knows what attention is. *Attention, Perception, & Psychophysics*, *81*(7), 2288–2303. <https://doi.org/10.3758/s13414-019-01846-w>
- Kretschmer, C., Burcu Goz Tebrizcik, & Dommett, E. (2022). Mindfulness interventions for Attention Deficit Hyperactivity Disorder: A systematic review and meta-analysis. *Psychiatry International*, *3*, Article 46. <https://kclpure.kcl.ac.uk/portal/en/publications/mindfulness-interventions-for-attention-deficit-hyperactivity-dis>
- Lindsay, G. W. (2020). Attention in psychology, neuroscience, and machine learning. *Frontiers in Computational Neuroscience*, *14*, Article 29. <https://doi.org/10.3389/fncom.2020.00029>
- Mirabella, G. (2020). Inhibitory control and impulsive responses in neurodevelopmental disorders. *Developmental Medicine & Child Neurology*, *63*(5). <https://doi.org/10.1111/dmcn.14778>
- Poissant, H., Mendrek, A., Talbot, N., Khoury, B., & Nolan, J. (2019). Behavioral and cognitive impacts of mindfulness-based interventions on adults with Attention-

## Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms

- Deficit Hyperactivity Disorder: A systematic review. *Behavioural Neurology*, 2019, 1–16. <https://doi.org/10.1155/2019/5682050>
- Senkowski, D., Ziegler, T., Singh, M., Heinz, A., He, J., Silk, T. J., & Lorenz, R. C. (2023). Assessing inhibitory control deficits in adult ADHD: A systematic review and meta-analysis of the stop-signal task. *Neuropsychology Review*, 34. <https://doi.org/10.1007/s11065-023-09592-5>
- Ustun, B., Adler, L. A., Rudin, C., Faraone, S. V., Spencer, T. J., Berglund, P., Gruber, M. J., & Kessler, R. C. (2017). The World Health Organization Adult Attention-Deficit/Hyperactivity Disorder Self-Report Screening Scale for DSM-5. *JAMA Psychiatry*, 74(5), 520. <https://doi.org/10.1001/jamapsychiatry.2017.0298>
- Whitfield, T., Barnhofer, T., Acabchuk, R., Cohen, A., Lee, M., Schlosser, M., Arenaza-Urquijo, E. M., Böttcher, A., Britton, W., Coll-Padros, N., Collette, F., Chételat, G., Dautricourt, S., Demnitz-King, H., Dumais, T., Klimecki, O., Meiberth, D., Moulinet, I., Müller, T., & Parsons, E. (2021). The effect of mindfulness-based programs on cognitive function in adults: A systematic review and meta-analysis. *Neuropsychology Review*, 32(3). <https://doi.org/10.1007/s11065-021-09519-y>
- World Health Organization. (2019). *ICD-11: International classification of diseases*. <https://icd.who.int/en/>
- Yakobi, O., Smilek, D., & Danckert, J. (2021). The effects of mindfulness meditation on attention, executive control and working memory in healthy adults: A meta-analysis of randomized controlled trials. *Cognitive Therapy and Research*, 45. <https://doi.org/10.1007/s10608-020-10177-2>

### **Acknowledgment**

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

### **Conflict of Interest**

The author(s) declared no conflict of interest.

**How to cite this article:** Kumar, K. (2025). Evaluating the Impact of Brief Mindfulness Practices on Inhibitory Control and Attention in Adults with Self-Reported ADHD Symptoms. *International Journal of Indian Psychology*, 13(3), 1682-1687. DIP:18.01.155.20251303, DOI:10.25215/1303.155