Mindfulness Training for Adults with Attention-Deficit/Hyperactivity Disorder: Implementation of Mindful Awareness Practices in a French-Speaking Attention-Deficit/Hyperactivity Disorder Unit

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Abstract

Introduction: Mindfulness-based programs are a promising option for patients with attention-deficit/hyperactivity disorder (ADHD), who face attention, hyperactivity, and emotion dysregulation issues in their daily life.

Objective: To examine the implementation and impact of specific mindfulness training for adults with ADHD in a French-speaking unit.

Methods: Thirty-eight adults with ADHD were included in an 8-week Mindful Awareness Practices (MAPs) program. Patients were assessed for ADHD symptoms, anxiety, depression, and mindfulness skills, before (T1) and after (T2) the eight sessions, and then 2 months later (T3).

Results: The patients adhered to the program as the majority of them completed it. A significant decrease in ADHD, depression, and anxiety symptoms was found between T1 and T2. Regarding mindfulness skills, a significant increase was observed between T1 and T2 in Observing, Describing and Nonreactivity to inner experience cores, but not Acting with awareness and Nonjudging of inner experience scores. There was no significant change between T2 and T3.

Conclusion: The MAPs program was successfully implemented and showed promising effects on ADHD symptomatology and related symptoms.

Keywords: ADHD, attention, adult, mindfulness training, depression

Introduction

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD) is a neurodevelopmental disorder characterized by inattention, hyperactivity, and impulsivity, which affects around 5% of the adult general population.^{1,2} Three presentations of ADHD are described in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental

Disorders (DSM-5):³ predominantly inattentive, predominantly hyperactive-impulsive, and combined. ADHD is a lifelong condition associated with marked impairments in familial, social, and professional functioning. Stimulant treatments have been shown to be effective in treating ADHD symptoms, but some patients respond poorly or not at all to treatment,^{4,5} some refuse to take medication, and others ask for alternative or complementary approaches. For these

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reasons, mindfulness meditation represents a promising option for ADHD patients.

Mindfulness can be defined as paying attention, on purpose, in the present moment, and nonjudgmentally.⁶ It involves sustained attention to, and acceptance of, the present moment⁷ and requires a set of skills, including being non-reactive, observing with awareness, acting with awareness, describing with awareness, and adopting a nonjudgmental approach toward one's experience.⁸ Initially developed to reduce stress (e.g., related to pain) and prevent relapses into depression, mindfulness-based interventions have since been adapted for several psychologic problems, including coping with pain and fibromyalgia, eating disorders and substance use,⁹ and ADHD.^{10,11}

Mindfulness might seem incompatible with the profile of ADHD patients, who must deal with loss of vigilance, distractibility, lack of sustained attention, and mind wandering. However, ADHD and mindfulness can join forces, as the principal objectives of mindfulness practice are to learn to be more aware of attention movements and identify the points when attention is lost.

A recent meta-analysis of the impact of mindfulness-based interventions reports that they are beneficial for ADHD symptoms.¹¹ However, adaptations of classic meditation training methods are recommended to make this practice more suitable and comfortable for ADHD patients. Zylowska¹² developed an eight-step mindfulness meditation program called Mindful Awareness Practices (MAPs). The intervention provides psychoeducation on the clinical symptoms, neurobiology, and etiology of ADHD. Didactic visual supports are used to illustrate and explain the concepts discussed. Each session begins with a short meditation and a discussion of home practice, followed by the introduction and practice of new exercises, the presentation of next week's home practice, and a closing meditation. The mindfulness practice duration is gradually lengthened from 5 to 15 min, rather than the 45 min recommended in more classic programs. Informal practices in everyday life are encouraged and walking meditation can be substituted for sitting meditation to handle impatience and urges to move. A loving kindness practice is also included to address the low self-esteem and frequent judgmental thoughts associated with ADHD.

So far, few studies have been conducted on this specific mindfulness training. In an uncontrolled study, Zylowska et al.¹³ examined the feasibility of the 8-week MAPs program in a sample of 24 adults and 8 adolescents with ADHD. ADHD symptoms, anxiety, and depression improved after treatment. In a second pilot study,¹⁴ adults with ADHD were randomly assigned to a MAPs program or a waiting list control group. ADHD symptoms and emotional dysregulation improved for the treatment group compared with the control group. Bueno et al.¹⁵ compared 21 ADHD patients (14 on medication) and 8 healthy subjects who participated in an 8-week MAPs program to 22 ADHD patients and 9 healthy subjects who did not. An increase in quality of life and mood and an improvement in attention were observed for MAPs participants (both patients with ADHD and healthy subjects), but no significant difference between controls and patients was found. Recently, a randomized controlled trial, including 81 medication-free adult ADHD patients¹⁶ compared an 8-week MAPs program to

structured psychoeducation. Both treatment groups showed significant improvements in ADHD symptomatology at 8 weeks and the 6-month follow-up, but no difference in symptom reduction was found between the treatment groups. Women seemed to benefit more from the interventions, whereas men showed more pronounced changes during the MAPs treatment.

The principal aim of this study is to implement Zylowska's MAPs program in a French-speaking adult ADHD unit to offer patients a larger treatment panel. A secondary goal is to evaluate the benefits of this practice for mindfulness skills and ADHD and related symptoms.

Methods

Participants

Thirty-eight patients who met the DSM-5 criteria for ADHD³ were included after assessment by a trained psychiatrist using the semistructured Diagnostic Interview for Adult ADHD, which applies the DSM-5 criteria.¹⁷ Nineteen men and 19 women were included; 63% had a combined presentation and 37% a predominantly inattentive presentation. They were recruited in a specialized center for the diagnosis and care of adult ADHD patients at the Geneva University Hospitals, Switzerland. The MAP program was proposed to them after the diagnostic confirmation in the specialized center, at the beginning of their therapeutic follow-up.

The mean age of the sample was 40.5 years ($SD=11.5$), 47% were single ($N=18$), 42% ($N=16$) married or in a couple and 11% separated or divorced ($N=4$). Most participants had completed secondary education ($M=15.9$ years of education; $SD=2.8$) and 66% were employed at the time of the study. A dropout rate of 18.4% ($N=7$) was observed in the initial sample of 38 patients. The reasons for the dropouts were as follows: one person was hospitalized for somatic reasons, two people complained about anxiety during the sessions, and four people mentioned that the group did not meet their expectations. Among the participants included in the study, 21% participated in <50% of the group sessions, meaning that 30 participants attended at least 50% of the sessions.

Finally, 25 patients (12 men and 13 women; 64% with a combined presentation and 36% with a predominantly inattentive presentation) completed the questionnaires at T1 and T2; 44% of these participants were taking psychostimulant medication (8 patients were treated with methylphenidate, 2 with lisdexamfetamine, and 1 with atomoxetine) during the study. The mean age of this final sample was 41 years ($SD=12.2$), 48% were single, 48% married or in a couple, and 4% separated or divorced. Most of them had secondary education (mean = 16.6; $SD=2.8$) and 76% were employed at the time of the study.

The study was approved by the ethics committee of the Geneva University Hospitals and informed written consent was obtained from all participants.

Measures

All participants completed the following self-report questionnaires at the beginning and end of the MAPs program, then after 2 months:

- The Adult ADHD Self-Report Scale-V1.1 (ASRS)¹⁸ measures the frequency of hyperactive-impulsive (nine items) and inattentive (nine items) symptoms.
- The Beck Depression Inventory II (BDI-II)¹⁹ was used to assess the presence and severity of depression symptoms. It includes 21 items rated on a 4-point scale (0–3). The total score ranges from 0 to 63, with higher scores indicating greater severity.
- The State-Trait Anxiety Inventory (STAI)²⁰ measures the presence and severity of anxiety symptoms and proneness to be anxious. There are two subscales: the State Anxiety Scale (20 items), which evaluates the current state of anxiety, and the Trait Anxiety Scale (20 items), which evaluates stable aspects of anxiety proneness. Raw scores of 0–39 are considered to indicate nonclinical anxiety, scores of 40–51 indicate moderate clinical anxiety, and scores >51 indicate high clinical anxiety.
- The Five Facet Mindfulness Questionnaire short form (FFMQ-SF)²¹ is a 24-item version of the original version by Baer et al.⁸ The following mindfulness facets are measured: Observing, Describing, Acting with awareness, Nonjudging of inner experience, and Nonreactivity to inner experience. The items are rated on a 5-point Likert scale, ranging from 1 (never or very rarely true) to 5 (very often or always true). Scores range from 5 to 25 except for Observing (range 5–20), with higher scores indicating better mindfulness skills.

Intervention

Four 8-week MAPs programs, including 8–10 participants each were conducted for a 2-year period. Each group session lasted 2 h and was led by two psychiatric nurses with personal mindfulness practice and expertise in ADHD symptomatology and mindfulness training. A first pretreat-

ment introductory meeting was led by an expert ADHD psychiatrist. Information about ADHD symptoms and the rationale for mindfulness practice was provided. The following eight steps were trained: attention and the five senses; mindful breathing; mindfulness of sound, breath and body; mindfulness of body sensations and movement; mindfulness of thoughts; mindfulness of feelings; mindful listening and speaking; and mindful decisions and actions. Two months after the end of the program, participants met again for a 2-h follow-up session. Homework was given in the form of formal mindfulness practice or informal mindfulness practice in everyday life and participants were strongly encouraged to complete it. Patients received handouts and audio recordings. During the program, patients followed their usual pharmacologic treatment.

Data analysis

Repeated measures *t* tests were computed to assess possible differences between T1 (pregroup) and T2 (postgroup) and possible changes from T2 to the 2-month follow-up (T3). All analyses were performed using SPSS. The significance level was set at 0.05.

Results

Means and SDs at T1 (pregroup), T2 (postgroup), and T3 (2-month follow-up) for each variable are presented in Table 1. Repeated measures *t* tests showed a significant decrease in hyperactive-impulsive and inattentive symptoms (ASRS) between T1 and T2, as well as in depressive (BDI-II) and anxiety symptoms (STAI) (Table 1).

Regarding mindfulness skills, repeated measures *t* tests showed an increase in Observing, Describing, and Nonreactivity to inner experience scores (Table 1). There was,

TABLE 1. MEAN (SD) FOR SCORES ON THE ASRS, BDI-II, STAI, AND FFMQ AT T1, T2, AND T3

	N	T1	T2	t	p T1 vs. T2	Follow- up	N	T3	t	p T2 vs. T3	D
Adult ADHD self-report scale	24						19				
Inattention		25.5 (6.2)	22.3 (6.4)	4.36	<0.001	0.90		22.3 (5.5)	1.15	0.26	0.3
Hyperactivity/impulsivity		21.9 (5.0)	19.5 (5.7)	1.22	<0.01	0.60		18.9 (5.4)	1.22	0.24	0.3
Beck depression inventory-II	24						20				
		18.4 (12.0)	10.6 (8.2)	3.67	<0.01	0.80		9.5 (9.2)	0.89	0.39	0.2
State-trait anxiety inventory	23						18				
State		52.3 (10.3)	46.5 (10.8)	2.54	<0.05	0.50		43.3 (12.5)	1.34	0.20	0.5
Trait		54.5 (10.5)	48.4 (10.9)	3.11	<0.01	0.70		46.9 (11.9)	0.24	0.82	0.7
Five facet mindfulness questionnaire	23						18				
Observe		13.0 (3.2)	14.4 (3.0)	2.04	0.05	0.40		15.11 (3.5)	-0.95	0.36	0.2
Describe		14.1 (4.0)	15.3 (4.0)	2.60	<0.05	0.50		15.9 (4.8)	-1.20	0.25	0.3
Act with awareness		14.7 (4.6)	14.7 (3.5)	0.05	0.96	0.01		14.6 (3.6)	-0.57	0.58	0.1
Accept without judgment		15.5 (4.1)	16.2 (4.0)	0.71	0.48	0.20		16.8 (3.8)	-0.70	0.50	0.2
Nonreactivity to inner experience		10.4 (3.0)	13.1 (3.4)	3.76	<0.01	0.80		14.4 (3.9)	-0.85	0.41	0.2

ADHD, attention-deficit/hyperactivity disorder.

however, no change in Acting with awareness and Nonjudging of inner experience scores between T1 and T2.

For all variables, analyses showed that there was no significant change between the end of the sessions (T2) and the 2-month follow-up (T3).

Discussion

The aim of this study was to present the implementation of an 8-week MAPs program in a French-speaking unit for adults with ADHD, and to describe its results. To the authors' knowledge, this is the first implementation and evaluation of this treatment in a French-speaking population. Moreover, it is also of specific value as it was led by an independent team without the involvement of the developer of the MAPs. Lack of independence is mentioned as a possible bias (allegiance effect) in psychotherapy research.²² The authors reported 82% of completed treatments, which matches the 78% adherence rate described by Zylowska et al.¹³ This participation rate suggests that the mindfulness practice program adapted for ADHD populations is a feasible and well-tolerated intervention.

Although the intervention was relatively short, it was associated with a significant decrease in the severity of core ADHD symptoms, with a large effect size for inattention (0.90) and a medium effect size for hyperactivity-impulsivity (0.60) scores on the ASRS. These results show that mindfulness practice engages and improves sustained attention to the present moment, mind wandering and distraction monitoring, and attention flexibility.²³ The reduction in hyperactivity-impulsivity symptoms is also consistent with studies that examined the impact of mindfulness practice on executive functions, and specifically cognitive and motor inhibition. In fact, several studies found improvements in inhibition of automatic responses after mindfulness meditation.²⁴ Being more aware of one's own thoughts, emotions, behaviors, and urges contribute to mental control and self-regulation, which are necessary to achieve goals and avoid impulsive behaviors.

Regarding mindfulness skills, the results show improved scores on the Observe, Describe, and Nonreactivity to inner experience subscales of the FFMQ-SF (Table 1), whereas no statistically significant change was observed for Acting with awareness and Nonjudging of inner experience. Observing and describing are core skills in mindfulness practice as they require attention to one's experiences in the present moment. They involve noticing thoughts, feelings, and sensations without considering their quality or content. Nonreactivity to inner experience is the ability to take a nonattached stance toward what is observed. In ADHD, behavioral and cognitive impulsivity and especially an urge to act when an emotion is felt are often described. Mindfulness practice is apparently an efficient way to observe and restrain emotional urges to action and impulsive behaviors, as it facilitates self-monitoring. However, the abilities to act with awareness and adopt a nonjudgmental position may require more practice before a change is observed. Changes in these skills were reported in a 12-month follow-up trial assessing the beneficence of a structured psychoeducational CBT treatment for ADHD, including mindfulness practice. Further studies more specifically on MAPs must be conducted to clarify this point.

Results showed a decrease of depressive symptoms (BDI-II), with a large effect size (0.80), and of anxiety symptoms, with medium effect sizes (STAI state 0.50; STAI trait 0.70). These changes in depression and anxiety are similar to those reported by Zylowska et al.¹³ with the MAPs program and with mindfulness-based interventions more generally.¹⁰ Mindfulness practice encourages the observation of emotions and negative thoughts, which could help to reduce anxiety and depressive symptoms. However, other factors such as group support or psychoeducation elements could have contributed to the positive effect of the MAP intervention.

For all participants, there was no significant change between the end of the group sessions (T2) and the 2-month follow-up (T3), suggesting that the improvement could be maintained over time. The focus on practicing exercises in everyday life might contribute to the integration and maintenance of mindfulness skills over time.

Limitations

The major limitation of this study is the absence of a control group or a randomization procedure. The second limitation is the small sample size. However, the authors' principal goal was to assess the feasibility and implementation of the program in a French-speaking population. Participation was voluntary. Participants were included when they expressed an interest in the MAPs program. In further studies it would be interesting to include a control condition and to enroll a larger sample of participants, which would make it possible to identify indicators of response or nonresponse and define a specific profile of patients who benefit most from this kind of mindfulness intervention. It would also be interesting to assess the level of at home practice to assess the specific effect of the frequency of mindfulness practice on mindfulness skills improvement. Another limitation concerns the fact that one cannot rule out the possibility that a change in mental condition or stress level explained the improvement in ADHD variables. Further studies should control for the presence of mood disorders in patients to ensure that any change is explained by attention training.

In the authors' experience, group members often reported that the group was an important resource for information sharing and mutual support. They also appreciated the nonjudgmental compassionate climate. The authors have recently added a satisfaction questionnaire and a measure of home practice to answer these questions.

Conclusion

Preliminary outcomes support the feasibility and interest of the program for patients, whether or not they are receiving pharmacologic treatment. The MAPs program was successfully implemented in a French-speaking population. The results of the pre-post assessments must be considered exploratory; nonetheless, they are promising. The stability of the results at the 2-month follow-up is very promising for adult ADHD patients who have often difficulties integrating and maintaining newly learned skills. A longer follow-up should be proposed to assess the impact of this kind of mindfulness program, including repeated practice, on a chronic condition such as ADHD.

Author Disclosure Statement

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References

- Fayyad J, De Graaf R, Kessler R, et al. Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. *Br J Psychiatry* 2007;190:402–409.
- Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. *Am J Psychiatry* 2006;163:716–723.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Arlington, VA: American Psychiatric Association, 2013.
- National Institute for Health and Care Excellence. Attention Deficit Hyperactivity Disorder: Diagnosis and Management. NICE Guideline, 2018 [homepage on the Internet]. Online document at: www.nice.org.uk/guidance/NG87, accessed September 13, 2019.
- Wigal SB. Efficacy and safety limitations of attention-deficit hyperactivity disorder pharmacotherapy in children and adults. *CNS Drugs* 2009;23:21–31.
- Kabat-Zinn J, Hanh TN. Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness. New York: Random House Publishing Group, 2009.
- Bishop SR, Lau M, Shapiro S, et al. Mindfulness: A proposed operational definition. *Clin Psychol Sci Pract* 2004; 11:230–241.
- Baer RA, Smith GT, Lykins E, et al. Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment* 2008;15:329–342.
- Khoury B, Lecomte T, Fortin G, et al. Mindfulness-based therapy: A comprehensive meta-analysis. *Clin Psychol Rev* 2013;33:763–771.
- Poissant H, Mendrek A, Talbot N, et al. Behavioral and cognitive impacts of mindfulness-based interventions on adults with attention-deficit hyperactivity disorder: A systematic review. *Behav Neurol* 2019;2019:5682050.
- Xue J, Zhang Y, Huang Y. A meta-analytic investigation of the impact of mindfulness-based interventions on ADHD symptoms. *Medicine* 2019;98.
- Zylowska L. The Mindfulness Prescription for Adult ADHD: An 8-Step Program for Strengthening Attention, Managing Emotions, and Achieving Your Goals. Boston, MA: Shambhala, 2012.
- Zylowska L, Ackerman DL, Yang MH, et al. Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *J Atten Disord* 2008;11:737–746.
- Mitchell JT, McIntyre EM, English JS, et al. A pilot trial of mindfulness meditation training for ADHD in adulthood: Impact on core symptoms, executive functioning, and emotion dysregulation. *J Atten Disord* 2013;21:1105–1120.
- Bueno VF, Kozasa EH, da Silva MA, et al. Mindfulness meditation improves mood, quality of life, and attention in adults with attention deficit hyperactivity disorder. *Biomed Res Int* 2015;2015:962857.
- Hoxhaj E, Sadohara C, Borel P, et al. Mindfulness vs psychoeducation in adult ADHD: A randomized controlled trial. *Eur Arch Psychiatry Clin Neurosci* 2018;268:321–335.
- Kooij JJS. Adult ADHD: Diagnostic Assessment and Treatment. New York: Springer, 2012.
- Adler L, Kessler R, Spencer T. Adult Self Report Scale, ASRS-V1.1 Screener. New York: World Health Organization, 2003.
- Beck AT, Steer RA, Ball R, Ranieri W. Comparison of beck depression inventories-IA and -II in psychiatric outpatients. *J Pers Assess* 1996;67:588–597.
- Spielberger CD, Gorsuch RL, Lushene R, et al. Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press, 1983.
- Bohlmeijer E, Ten Klooster PM, Fledderus M, et al. Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form. *Assessment* 2011;18:308–320.
- Chambless DL, Hollon SD. Defining empirically supported therapies. *J Consult Clin Psychol* 1998;66:7–18.
- Malinowski P. Neural mechanisms of attentional control in mindfulness meditation. *Front Neurosci* 2013;7:8.
- Gallant SN. Mindfulness meditation practice and executive functioning: Breaking down the benefit. *Conscious Cogn* 2016;40:116–130.

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