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ADHD

Efficacy and acceptability of mindfulness based practice for university students with ADHD

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Publication Requirements

The journal I have selected for publishing my literature review is *Mindfulness*, published both online and in print by *Springer* (Springer, 2015). *Mindfulness* aims to “advance research, clinical practice and theory on mindfulness and are interested in articles from “diverse viewpoints, including psychology, psychiatry, medicine, neurobiology, cognitive, behavioural, cultural, philosophy, spirituality, and wisdom traditions. It serves as a much-needed forum for the broad-based, leading-edge research in this burgeoning field” (Springer, 2015). The journal “seeks to promote mindfulness by publishing scholarly papers on training clinicians, institutional staff, teachers, parents and industry personnel in mindful provision of services”(Springer, 2015).

Examples of topics are:

1. “Mindfulness-based psycho-educational interventions for children with learning, emotional, and behavioral disorders”
2. “Treating depression and clinical symptoms in patients with chronic heart failure”
3. “Yoga and mindfulness”
4. “Cognitive-behavioral mindfulness group therapy interventions”
5. “Mindfulness and emotional regulation difficulties in children”
6. “Loving-kindness meditation to increase social connectedness”
7. “Training for parents and children with ADHD” (Springer, 2015)

The managing editor of *Mindfulness* is Nirbhay N. Singh, (email: unavailable) from the Medical College of Georgia, Augusta University, Augusta, GA, USA. The publishing editor is Judy Jones (email: judy.jones@springer.com).

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The manuscript, “Mindfulness based practice for university students with ADHD” meets the requirements of the journal, *Mindfulness* as the manuscript:

1. Reviews clinical and neuroscience research on mindfulness in improving executive function, cognition and emotional regulation.
2. Addresses the application of mindfulness-based practices in an educational, post-secondary milieu.
3. Targets a specific population of university students with ADHD
4. Demonstrates the efficacy and acceptability of mindfulness-based practice as a coaching strategy for: Academic Strategists, counselors, wellness practitioners, professional ADHD coaches, student services and student success centers.
5. Provides qualitative information in the form of narrative reflections, to support the empirical quantitative data, strengthening the argument that mindfulness based practices are effective and acceptable strategies for university students to be successful in their post-secondary education.
6. Offers a new framework in which to measure the efficacy of mindfulness based practices for university students with ADHD, using narrative reflections, LASSI scores, and GPA of one university practitioner with ADHD in conjunction within an existing framework using: executive function, emotional regulation and change in perspective of self to measure benefits.

The specific manuscript submission requirements are:

- Articles submitted to *Mindfulness* are an average of 30 pages
- 10-point Times New Roman, using APA citation style.

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- An abstract of 150 to 250 words. The abstract should not contain any undefined abbreviations or unspecified references. **Abstract is 218 words**
- 4 to 6 keywords, which can be used for indexing purposes. **4 keywords**
- Manuscripts should be submitted in Word. Save file in docx format (Word 2007 or higher) or doc format (older Word versions).
- Use tab stops or other commands for indents, not the space bar.
- Use the table function to make tables.
- No more than three levels of displayed headings.
- Abbreviations should be defined at first mention and used consistently thereafter.
- Cite references in the text by name and year in parentheses. Example: Negotiation research spans many disciplines (Thompson 1990).
- Personal communications and unpublished works should only be mentioned in the text.
- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- A blinded manuscript without any author names and affiliations in the text or on the title page.
- Self-identifying citations and references in the article text should be avoided.
- A separate title page, containing title, all author names, affiliations, and the contact information of the corresponding author. Any acknowledgements, disclosures, or funding information should also be included on this page (Springer, 2015).
- The website for Mindfulness is: <http://link.springer.com/journal/12671>

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Springer, 2015. *Mindfulness*. Retrieved from

<http://www.springer.com/psychology/cognitive+psychology/journal/12671/PSE>

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Abstract

University students with Attention Deficit Hyperactivity Disorder (ADHD) face several obstacles to academic success due to deficits in executive function, emotional dysregulation, and anxiety. Results of clinical studies using both clinician and self-reports on the benefits of mindfulness based practice, as a treatment for ADHD is promising. Yet there is a scarcity of evidence to suggest that this is both an efficacious and acceptable academic strategy to be used in universities as a complementary practice to existing strategies. This review examines the current literature and places the findings into a theoretical framework to demonstrate the efficacy of mindfulness based practice to improve attention, emotional regulation, and academic success in university students with ADHD. The addition of a narrative self-report by a university student with ADHD and a practitioner of mindfulness-based practices; observations recorded by his academic coach; and quantitative measures: the Learning and Study Strategies Inventory (LASSI) scores and Grade Point Average (GPA) is a unique contribution providing further evidence. The findings from clinical studies conducted with adolescents and adults with ADHD, have been extrapolated to university students with ADHD. The findings from narrative self-report testify to the acceptability and efficacy of mindfulness based practices as an academic strategy that improves executive function of attention and emotional regulation, significantly reducing anxiety and improving self-efficacy.

Keywords: mindfulness based practice, university students, ADHD, academic strategies.

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By watching yourself in your daily life with alert interest with the intention to understand rather than to judge, in full acceptance of whatever may emerge, because it is here, you encourage the deep to come to the surface and enrich your life and consciousness with its captive energies. This is the great work of awareness; it removes obstacles and releases energies by understanding the nature of life and mind. Intelligence is the door to freedom and alert attention is the mother of intelligence (Nisargadatta Maharaj, 1973)

Attention Deficit Hyperactive Disorder (ADHD) and Attention Deficit Disorder (ADD) affects between 2% and 8% of the American college population and is thought to be on the rise in post-secondary students (DuPaul & Weyandt, 2009). University students with ADHD have lower GPA's, high rates of drop out or academic probation, and poor social, psychological functioning due to their struggle with managing time, planning, sustained attention, motivation, and goal setting (Fleming and McMahon, 2012). The implications of this suggests an “urgent need for effective, evidence based interventions for ADHD among college students” (Fleming and McMahon, p. 304). Mindfulness based practices (MBPs), derived from Eastern contemplative spiritual traditions such as Zen Buddhism and Vipassana meditation, have emerged in the last 10 years in clinical studies as an effective “third wave” behavioural treatment for managing symptoms of ADHD in adolescents and adults (Baer, 2003 and Mitchell et al., 2015). Mindfulness described by John Kabat-Zinn, who designed Mindfulness Based Stress Reduction (MBSR) and himself a trained teacher in Zen Buddhism, is awareness that arises from paying attention, on purpose, without judgement in the present moment (Kabat-Zinn, 2011). This act of paying attention, which involves being aware of when the mind is distracted and choosing to bring it back to the object of focus for a sustained period of time, activates the executive function network, creating neuroplastic changes in the brain, resulting in increased self-regulation of attention (Baer, 2003; Hozel, Lazar, Gard et al., 2011).

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The early research on MBSR has cited several Zen Buddhist traditions including Theraveda and Mahayana as well as the yogic teachings of J. Krishnamurti and Ramana Maharshi (Kabat-Zinn, 2011). Due to the rise of the practice of MBSR throughout the world, with over 19,000 graduates of MBSR training, this ancient technique of controlling the mind have been adopted into a Western secular context (Ergas, 2013). Mindfulness based practice has gained popularity in public schools where the benefits are seen in increasing attention span, working memory, executive functions, and self-regulation (Ergas, 2013, pp. 62) and as a promising treatment for emotional regulation in adolescents and adults with ADHD (Zylowska, Ackerman, Yang et al., 2008).

ADHD is associated with cognitive impairments such as executive functioning (EF), including working memory, complex problem solving, sustained attention and self-regulation (Wedlake, 2002). Parker (2009) defines self-regulation as: “one’s ability to persist at goal-directed behaviour across time even in the face of negative emotions such as frustration and boredom” (p. 204). Other symptoms include emotional dysregulation- the ability to manage intense emotional reactions to everyday challenges and stressors, and comorbid symptoms of anxiety and depression. University students beginning their studies are on average 17-19 years old, one of the most difficult times of transition, from adolescence to adult, making it even more challenging for students with ADHD. These students are losing the support of the public school environment and the familiar parental structures, adding to the stressors of ADHD deficits in sustained attention, organization, self-management, motivation and social adaptation (Fleming & McMahon, 2012, p. 304). University students with ADHD also have been reported to have significantly lower self-esteem than non-ADHD students, which is significantly correlated with

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academic and occupational achievement (Shaw-Zirt, Popali-Lehane, Chaplin & Bergman, 2005). Therefore it is important to provide an early intervention such as coaching, counselling, student advising and learning supports for students coping with the symptoms of ADHD (Weyandt & DuPaul, 2006).

Academic coaching has evolved from purely academic support to providing cognitive behavioural techniques to address symptoms of ADHD, such as procrastination, problems with concentration, poor planning, time-management, self-regulation and comorbid symptoms of anxiety and depression (Prevatt, 2015). An updated definition of coaching as described by Kubik (2010) is to assist people with ADHD in building life skills, to change negative beliefs, while focusing on behavioural, emotional and cognitive outcomes. I have the privilege of coaching university students with ADHD where I draw upon on my personal experiences of using yogic tools and contemplative practices. This behavioural “third wave” intervention and strategy has helped students manage stress and build resilience in what is considered the most challenging environments for adults/adolescents with ADHD- the university environment. These mindfulness-based practices offer students tools in organizing their thoughts, focusing their minds, and helping them to manage the stress and anxiety that comes with being a student in a highly competitive environment. These practices include reflective journaling, mind watch, sensorial anchoring, sitting and walking meditation, and reflective Hatha yoga to calm the mind. One of the concerns as an Academic Strategist is the acceptability of a mindfulness-based practice by university students and colleagues, due to associations with Eastern religious traditions.

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Mindfulness based practices offer a feasible, beneficial and acceptable intervention for adults and adolescents with ADHD, yet a paucity of research has been conducted on the potential of this training as a learning strategy to improve executive functioning and emotional regulation in university students with ADHD. The role of executive control and emotional regulation is an important capacity that influences several life domains, including academic success. This is of relevance as university students with ADHD struggle with executive function deficits in time-management, motivation, self-discipline, concentration, complex problem solving and anxiety affecting their academic success. Use of these mindfulness based practices could greatly benefit post-secondary students with ADHD.

The literature review examines the existing clinical, behavioural, neurobiological and neuropsychological research, supporting MBP as an effective and acceptable strategy in combination with medication, in strengthening executive function deficits in attention and emotional dysregulation in adults and adolescents, ages 13-24 with ADHD. These two populations will be extrapolated to include university students ages 17-24. However, clinical studies conducted to date are insufficient evidence for the benefits of MBP as an academic strategy of university students. Therefore I have invited my co-author, a university student with ADHD to contribute to this study his reflections and observations, his Learning and Study Strategies Inventory (LASSI) scores (Weinstein, Palmer and Acee, 2016), and semester Grade Point Averages (GPA), identifying the benefits of MBPs as they relate to a proposed framework. Observations taken over a two-year period by the academic coach, substantiate the reflections provided by the co-author. The significance of this contribution lies in giving voice and narrative insights harvested from the experience of the practitioner as a complement to the quantitative

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measures, the LASSI and GPA scores. These insights add to the growing evidence of the benefits of mindfulness as a complementary treatment and strategy, in combination with pharmacological interventions for ADHD. My co-author welcomed the opportunity to contribute to this study, and this was approved by the Academic Strategist team lead.

Introduction and background. I am a 21-year-old male in my third year of university student pursuing a business undergraduate degree. I was initially diagnosed with ADHD when I was thirteen. The diagnosis took place when I was at a sleep clinic due to trouble sleeping and my brain waves were monitored. After being diagnosed I continued my grade school career as if nothing had changed, and was not medicated for the condition. When I started university (2014), I fell into some of my old patterns and finally went to the doctor to see what was going on. We discussed my options and I began pharmaceutical treatment of the ADHD. Since then I have been working with Accessibility Services at my university along with an academic strategist who has taught me mindfulness-based practices.

Method

Theoretical Framework for Mindfulness Based Practices- The Mechanisms

Mindfulness based practices or MBPs are now being conceptualized into a secular frameworks of mental, attention, cognitive and behavioural training, or in the case of adults with ADHD, the exercise of executive function network (Hasenkamp et al., 2012, p. 750). Students with ADHD report difficulties in areas associated with executive functioning as laid out by Barkley and Murphy (2011), involving 5 factors: Self Management to Time, Self-Organization/Problem- solving, Self-Discipline, Self-Motivation, and Self-

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Activation/Concentration. The Learning and Study Strategies Inventory (LASSI), is a screening tool for both students and coaches to identify areas of needed improvement along with strengths and weaknesses, using 10 scales of measure, which fall under the category of either “skill”, “will” or “self-regulation”. This paper will focus on Anxiety, Attitude and Motivation (Will); Information Processing (Skill) and Concentration and Time Management (Self-Regulation) (Weinstein et al., 2016), corresponding to Barkley’s 5 factors of ADHD: Self- Discipline, Self-Motivation, Self-Organization/Problem-solving, Self-Activation/Concentration and Self-Management to Time, respectively. Hozel’s et al. (2011) framework, three key processes of mindfulness meditation: attention regulation and emotional regulation will be used to guide the literature review and student practitioner reflections, assessing the efficacy and acceptability of MBP as an intervention for university students with ADHD.

The research question that has directed this investigation is: Does mindfulness meditation improve the quality of life for university students with ADHD by strengthening executive functioning, (motivation, self-discipline, organization, time-management and sustained attention); improving emotional regulation, while reducing comorbid symptoms of anxiety thus improving academic success? Are mindfulness based practices (MBPs) acceptable as an academic strategy by university students with ADHD? A general search was conducted using university library databases, Google Scholar, PubMed and PsychInfo.

Inclusion criteria

The literature search included clinical studies using mindfulness meditation as a treatment for adolescents and adults, to include the overlapping age group of university students

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(17-24). The literature review examined recent clinical studies from 2005-2015 in a population of adolescents, adults and university students both with and without ADHD using mindfulness based practices as the key: 1) clinical intervention 2) in a coaching environment 3) and in neuroscience to understand the relationship of the treatment effects on the brain, improving executive functioning, cognition and emotional regulation.

Exclusion criteria

The focus of this literature review was on studies published in English and unpublished dissertations, books, web based articles, magazines and editorial comments were excluded.

Search items excluded were: 'Transpersonal meditation', 'relaxation', 'meditation and children', 'children with ADHD', 'gifted students', 'learning disabilities', 'tai chi', 'qi gong' and 'yoga' as sole treatments.

It is also important to state that I did not distinguish between the many types of mindfulness meditation practices used in clinical studies, such as mindfulness based cognitive therapy (MBCT; Teasdale et al., 2001), mindfulness based stress reduction (MBSR, Kabat-Zinn et al. 1992)), mindfulness awareness practices (MAPs, Zylowska et al., 2008), and Dialectical Behaviour Therapy (DBT; Koerner and Linehan, 2000) as each practice involves returning ones attention back to the breath or other anchor. Also, in some studies, there were additional practices to bring mindfulness into everyday life such as mindful eating, walking, drawing, listening to music, and washing the dishes (Zylowska et al., 2008; Mitchell et al., 2013; Tan & Martin, 2012). MBSR and MAPS are mindfulness based practices applying non-judgmental

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awareness of thoughts, emphasizing acceptance where for example CBT and DBT, requires the participant to observe and challenge the faulty thinking or schema (Tan & Martin, 2012).

Narrative Study

Observations were compiled over a 2-year period of weekly academic coaching sessions with a university student with ADHD. Quantitative assessment tools used in this study were the Learning and Study Strategies Inventory (LASSI) and Grade Point Average (GPA). The areas assessed by the LASSI were: 1) Anxiety and worry about school performance; 2) Attitude and interest; 3) Concentration and attention to academic tasks; 4) Information Processing, acquiring knowledge, and reasoning; 5) Motivation, diligence, self-discipline, and willingness to work hard; 6) Selecting main ideas and recognizing important information; and 7) Time-Management. The student has also provided a narrative self-report on the efficacy of mindfulness based practice using Hozel et al.'s (2011) framework.

Each session was 50 minutes in length, using a Socratic method of inquiry of academic and psycho-social needs of the student. Early assessment using the LASSI suggested that time-management, study, stress management and concentration strategies would benefit the student. Mindfulness based practices were introduced in the 5th session (see Table 1) to assist in managing anxiety and concentration by an academic coach with over 15 years of yogic training, over 10,000 hours of training, and a daily mindfulness practice.

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Literature Review

Attention Regulation

Academic Coach's Reflection. The academic strategies that I begin with in my own practice as a coach are 1) time-management strategies, i.e. planning ahead, maintaining an agenda, setting smart goals, and organizing each course's expectations and requirements. In the first session I introduce students to reflective journaling and relaxation, and I ask them to keep a journal over the course of our work together. These mindfulness based practices are considered essential in the yogic tradition and are known as Jnana yoga and yoga nidra respectively, the yoga of knowledge and sleep respectively. The purpose of Jnana yoga is to unite the personality with the higher knowing, involving self-mastery through: 1) discrimination 2) dispassion 3) virtues of tranquility, restraint, satiety or renunciation, endurance, faith and concentration, and finally 4) a desire for liberation from all limitations (Sivananda, 2007). Yoga nidra, is a practice both of concentration and relaxation, as one attends to each part of the body with the request to relax, resulting in a deep sense of calm and clarity, where both the body and mind are given the opportunity to become quiet. This practice develops body awareness, where the practitioner becomes familiar with body tension and the feeling when relaxed, the role of breath in relaxation and the inner rumblings of the stress response, i.e. increased heart rate, tightness in the jaw and abdomen and a nervous stomach.

Investigators have indentified that individuals with ADHD have cortical thinning in the anterior cingulated cortex (ACC), which promote executive function and attention (Makris, Biederman, Valera, Bush, Kaiser & Kennedy et al. 2007). University students with ADHD are

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looking for alternative ways to manage these deficits in executive function, especially when medication is either ineffective or side effects are intolerable. Deficits in executive function include 1) “meta-cognitive” executive functions such as the ability to problem solve, regulate attention, plan ahead, make decisions, and working memory; and 2) the “emotional/motivational” executive functions including motivation and impulse control, defined as the ability to control internal and external distractions that interferes with “behaviour, speech or cognition” (Ardila, 2008, p. 94). Mindfulness based practices are known to exercise areas of the pre-frontal cortex associated with these two categories of executive functioning by developing four different abilities: sustained attention on an object (the breath), monitoring (identifies when the mind wanders), disengaging from the distracting object (attention switching) and refocusing on the object of attention (the breath) (Chiesa et al., 2011, p. 452). These practices contribute to neuroplastic changes associated with enhanced executive attention, increases in positive reappraisal, reduction in reactivity to inner experiences resulting in behavioural flexibility and reduced stress after only 8 weeks of mindfulness practice (Chiesa et al., 2011; Hozel et al., 2011)

Clinical studies conducted in the last three years on the efficacy of mindfulness based practice on symptoms of ADHD in adolescents (ages 13-18), also suggest that an 8-week mindfulness based practice in conjunction with mindfulness training in parents, resulted in improved executive functioning. Van de Weijer-Bergsma, Formsma, Bruin and Bogels (2012) measured attention, mindfulness and behavioural problems using self, parent and teacher reports after 8 weeks of mindfulness training, noting improvements in all three categories, including executive functioning . Haydicky, Shecter, Wiener & Ducharme (2015) used mindfulness based

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cognitive therapy (MBCT) for adolescents with ADHD, resulting in improvements in attentiveness, and in emotional/motivational executive function. Adolescents reported fewer internalizing and externalizing problems, such as reduced depression and anxiety, and improved peer group relationships (Haydicky et al., 2015). Both studies demonstrate the positive outcomes of mindfulness based practices of improved attention and executive function (van de Weijer-Bergsma et al., 2012), with a significant reduction in anxiety and depression, maintained post treatment, 8 and 6 weeks respectively (Haydicky et al., 2015). Adolescent participants also demonstrated a high level of commitment to the sessions of mindfulness-based practices, suggesting both acceptability and feasibility of mindfulness-based practice as a realistic treatment option for adolescents with ADHD (Haydicky et al., 2015).

In neuroscience, mindfulness meditation is described as the development of neuroplasticity, resulting in structural and functional changes in the brain (Moore & Malinowski, 2009). Moore and Malinowski (2009) studied 25 participants from a Buddhist centre, who had at least 6 weeks of meditation practice and compared them to a control group. The meditators demonstrated significantly more attentional and inhibitory control, carefulness, and cognitive flexibility than non-meditators (Moore & Malinowski, 2009). It is this primary role of attention regulation in mindfulness, described by Bishop Lau, Shapiro, Carlson, Anderson et al. (2004) as “self regulation of attention so that it is maintained on immediate experience” that is characterized by a willingness to remain open and accepting of whatever arises (p. 3). Schoenburg, Hepark, Kan, Barendregt, Buitelaar et al. (2014) studied the effects of MBCT on 50 adults with ADHD, in a randomized controlled study, measuring error processing, response inhibition, attention training and self-regulation. Attention regulation was associated less with

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focused attention than awareness vigilance, described as a “more open, reflexive, enabling attentional ‘switching’ capacity” (p. 1413). MBCT was effective in improving attention regulation, error awareness and impulse regulation (Schoenburg et al., 2014).

Student Reflection. At the beginning of practicing mindfulness through the journaling process and mind watches I found the overall task to be rather difficult. Quite often I would be distracted and would end up writing or concentrating on the interruptions of sound around me. I realize now that this was to be expected because as a person with ADHD this was a habit formed over time, which are typically a struggle for people with my condition. Looking back at my initial attempts it is quite obvious from my reflections and mind watches I was speaking more about getting distracted by noise, continually having to refocus on the breath. However, the more I practiced I was able to form a new habit of focusing on the breath and as a result did not have to constantly remind myself. Through this process I was able to watch the mind to determine the causes of these distractions and gain insight into the causes. Once this new habit began to form I noticed a significant change in my typical day-to-day interactions, most apparent in my increased ability to notice when my mind would wander. I believe that through the practice of watching my mind with the only purpose of following my train of thought I was able to notice this in other situations. Personally I believe that people with ADHD have a strong tendency to form both positive and negative habits, i.e. due to having to find ways to solve the challenges they face day-to-day. For example, in my case I have a habit of doing everything in a rushed pace. This is because I know I am likely to become unfocused on my task, and if I complete it quickly, I am more likely to finish it than if I took my time, potentially losing my attention. Developing positive habits is crucial to the success of a person with ADHD. I have developed a new habit of

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noticing my mind wander by practicing it in a manufactured situation. These practices gave me the framework to build my awareness of catching my mind wander sooner, within minutes, as opposed to previous times when zoning out would last for as long as a half an hour.

Additionally, mindfulness practices have allowed my mind to unwind. Typically I find that as a person with ADHD I am constantly taking in so much at the same time. Everything seems to be a distraction whether it is a sound, sight or feeling. Previously, when I found myself trying to gather my thoughts it always seemed like a jumbled mess, like a tangled ball of string. Through mindfulness based practices I have been able to find and trace origins of my thought and better express myself, allowing myself to sort the tangled ball into a linear string, clearing my mind.]

Emotional Regulation

The importance of the original mindfulness based practices for stress reduction (MBSR) developed by John Kabat Zinn, is the act of attending to thinking with non-judgmental awareness or acceptance of what arises on the landscape of the mind. The role of 'acceptance' in mindfulness meditation is key in these teachings. In my own experience of 20 years of yogic training and practice, the act of judging is a glue, that binds us to the thought by the emotions associated with judging, such as shame, guilt, regret, anger etc. University students with ADHD experience emotional and behavioural difficulties, which contribute to low academic achievement and personal stress (Weyandt & DPaul, 2006) and comorbid or secondary symptoms of anxiety or depression (Barkley, 2006), which further exacerbates the challenges of transitioning into the university environment.

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Mindfulness based training programs have been explored as interventions for adolescents (ages 13-18) with mental health disorders (Tan & Martin, 2015), with positive results. Two clinical studies carried out by Amy Tan (2012) and Tan and Martin(2015), demonstrate a significant reduction in both psychological distress and inflexibility, and improvement in mindfulness, self-esteem and mental health in adolescents who received mindfulness training over a period of 5 weeks. Both parents and adolescents responded to questionnaires pre, post and 3 months after the treatment in both studies, where they found that 89% of the participants were continuing to practice mindfulness. Tan and Martin (2012) gathered qualitative data regarding the acceptability of the program, and found that the participants enjoyed the mindfulness-based practices, would recommend the practice to friends, and wanted more sessions (p. 308). The improvements in mental health were sustained up to period of 3 months. These encouraging findings were further supported in their 2015 study where 108 teenagers between the ages of 13-18 participated in a stronger, randomized control trial measuring the efficacy of mindfulness-based program for adolescents with mental health problems.

A feasibility study carried out in 2008 by Zylowska, Ackerman, Yan, Horton, Hale & Pataki was the beginning of bridging MBSR (designed for patients managing stress associated with major health crises), with adults and adolescents with ADHD. Mindful awareness practices (MAPs) were delivered over an 8-week period, where participants attended a 2.5 hour session once a week, followed up with a daily home practice (Zylowska et al., 2008). The preliminary findings were encouraging, suggesting that mindfulness based practices were both efficacious in improving symptoms of attention and cognitive inhibition, as well as anxiety and depression.

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Most of the participants completed the training and reported a high degree of satisfaction and acceptability of the program (Zylowska et al., 2008. p. 744).

The above study is important in addressing the challenges of carrying out a clinical study on the efficacy of mindfulness based practice on an adult/adolescent population with ADHD (which translates into a university population) due to the many variables found across a group of participants, such as gender, age, socio-economic status, ethnicity, IQ, the rate of comorbidity, and finally the medication regime (Zylowska et al., 2008,). The psycho-education component also may have attributed to the results, as it reframed ADHD from a neurobiological “disorder” to a “difference”, which may have resulted in a more positive self-report of ADHD symptoms (Zylowska et al., 2008, p 744). Follow-up experiments were conducted addressing the findings in the above clinical study. Mitchell, McIntyre, English, Dennis, Beckhan & Kollins (2013) designed a study where 20 participants were stratified by their medication status, randomized using a control or waitlist group, using both self-reported and clinician assessments (i.e. Deficits in Executive Functioning Scale (DEFS; Barkley, 2011)) of ADHD symptoms after an 8-week group based mindfulness treatment. Findings from this pilot trial, suggest that mindfulness training in the treatment group (n=10) demonstrated improvements in both self and clinician reported symptoms in Barkley and Murphy’s (2011) 5 domains (DEFS) for ADHD when compared with the waitlist group (n=9) (Mitchell et al., 2013). Both treatment feasibility and acceptability were measured, with positive results (Mitchell et al., 2013).

Most recently Janssen et al. (2015) have designed a protocol for a future study to investigate the role and efficacy of mindful-based cognitive therapy (MBCT) in a clinical

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population of adults with ADHD, addressing the limitations of past studies. This study will use a randomized, multicentre, control design, with 120 participants 18 years and older with ADHD, diagnosed using criteria from DSM-IV-TR, using exclusion and inclusion criteria. The participants will be randomized into MBCT training and a waitlist, treatment as usual (TAU) group. Measurements will take place at baseline, three, six and nine months later. Primary and secondary measures will be made, assessing severity of ADHD symptoms by a blinded clinician and a self-report of executive functioning, well-being, mindfulness, and self compassion, respectively. The program uses a similar treatment protocol as Zylowska et al. (2008) and Mitchell et al. (2014), with changes based on the cognitive therapy component.

Smalley, Loo, Hale, Shrestha and McGough (2009) demonstrated the relationship of personality to mindfulness to determine if adults with ADHD would benefit from mindfulness practices. Three measures that demonstrated significant differences between the ADHD group (n=51) and the non-ADHD (n=54) were mindfulness, self-directedness (SD) and self-transcendence (ST). Participants with ADHD scored lower than the non-ADHD participants on mindfulness and self-directedness, suggesting that a treatment that improves SD, may be successful in treating ADHD an Axis I disorder (p. 1095). Correlations have been found between self-transcendence and mindfulness (p. 1090), suggesting the importance of “stepping outside of oneself” in the practice of mindfulness, indicating a relationship between ST and meta-cognition. Participants with ADHD scored higher on the self-transcendence ST, suggesting adults with ADHD are more idealistic, transpersonal, spiritual, faithful and thus maybe more open to adopting and maintaining a mindfulness practice. Well-being is associated with elevated SD and

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ST and both may be elevated using mindfulness meditation (p. 1095), a benefit that transcends this population group (Smalley et al., 2009).

Current studies in neuroscience are demonstrating the role of the default mode network (DMN) in the brain associated with mind wandering. People with a greater tendency for mind wandering experience more activity in this region when carrying out repetitive tasks (Hasenkamp, Wilson-Mendenhall, Duncan & Barsalou, 2012). The 4 phases of mindfulness meditation: sustained focus, mind wandering, awareness of mind wandering and finally shifting attention back to the object of focus, activate task-positive network and DMN. This task-positive network, activated during sustained focus and shifting attention back is connected to the executive function network involving working memory, cognitive control and conflict monitoring (Hasenkamp et al., 2012, p. 750). When the mind wandered, the DMN was activated. According to Sidlauskaite, Sonug-Barke, Roeyers and Wiersma (2016), disturbances in attention in individuals with ADHD are associated with excess levels of activity in the DMN, reducing personal efficacy. Additionally, increased DMN activity is linked with negative mental states such as depression (Hasenkamp et al., 2012). Hozel et al. (2011) discovered a decrease in grey matter concentration around the amygdala after 8 weeks of mindfulness meditation resulting in a reduction in reactivity to inner experiences. These studies suggest that the movement between states of awareness during mindfulness meditation exercises the executive function network, resulting in improved emotional regulation. The improvement of executive control of emotion is an important capacity that influences several life domains, including academic success and well-being, further emphasizing the need for an effective, non-pharmacological intervention for university students with ADHD.

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Student reflection. When I view emotional regulation, I believe this enhances cognitive functioning, attention regulation, etc.. In the previous entry, I mentioned how I have the habit of doing things in a rushed pace. As a result if there was someone or something preventing me from doing this I often became frustrated. I realize now that this is because any slow downs potentially led me to losing attention and preventing me from completing my initial goal. Through journaling processes I have been able to properly trace my thoughts and better understand why I may feel or act a certain way. Initially in the journaling process I was only able to reflect after I had stepped away from an emotional situation to properly understand it. After journaling for an extended amount of time I can now better identify the source and reason for the emotions during the situation. I now have a better understanding of my thoughts and at the best of times, can stop the emotionally based impulses. This has resulted in improvements in my relationships, increased my ability to properly communicate with individuals, and stop being reactionary.]

Mindfulness meditation and coaching university students with ADHD

Studies conducted to date on the efficacy of academic coaching in university students with ADHD are very positive. Prevatt & Yelland (2015) demonstrated in a population of 148 college students over a 5-year period who received ADHD coaching, experienced improvements in self-efficacy, time management, anxiety, motivation and test taking accompanied with increases in self-esteem. This study provided a detailed between session assignment (BSA) for students to implement over the course of a week, reminders and a to-do list. A qualitative study conducted by Parker and Boutelle (2009) employing a phenomenological approach studied the benefits and limitations students experience with ADHD coaching. Fifty-four students with

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ADHD and LD participated to examine the effect coaching had on reducing the challenges of executive function impairment. Their findings indicate that coaching supported the students in reaching their goals and their emerging autonomy, while developing tools to manage their executive function abilities (Parker & Boutelle, 2009, p. 204). Both studies did not include a MBP as a coaching strategy for students with ADHD.

Fleming, McMahon, Moran, Peterson and Dressen (2015) conducted the first randomized, control study of coaching college students with ADHD, assessing the efficacy, feasibility and acceptability of Dialectic Behaviour Therapy (DBT) group skills training in 33 college students with ADHD between the ages of 18 and 24. Participants received an 8-week DBT group skills training or a skill handouts. Outcomes were measured at base line, post and 3 months later. Week one consisted of an introduction to mindfulness meditation, and was rated by students as the most useful of all the DBT skills, compared to managing sleep and daily planner use. It was suggested that this secondary observation “warranted” further research to evaluate the independent and additive contribution of mindfulness and cognitive behavioural skills for college students with ADHD (p. 69). Students reported higher treatment responses (DBT) on ADHD symptoms and executive functioning, and overall improvement in quality of life when compared with the control group (Fleming et al., 2015).

Findings

The strategies used over the course of two years working with the student, included time-management, note taking, group work and presentation strategies. The key focus of the weekly semester sessions mindfulness based practices, including reflective journaling due to anxiety,

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followed by a discussion of the student’s insights. Observations and insights were recorded in a Session Summary and are compiled in Table 1, accompanied by his grade point average (G.P.A.), LASSI scores and the specific mindfulness practice used in the session.

When Connor started university he would experience “zoning out”, sometimes for more than 30 minutes, which meant he would miss most of his course lectures. He was also experiencing social anxiety, making it difficult to meet people and causing conflict in his relationships. His LASSI scores taken when we first met, indicated a high level of anxiety associated with the low score, and challenges in motivation, self-discipline, recognizing important information and time management.

The results of the observations suggest that weekly coaching sessions over 8-weeks using time-management, study and note taking strategies assisted Connor in raising his GPA from 2.0-2.8. The first 4 weeks of mindfulness based practice in conjunction with the above strategies may have contributed to higher marks, along with improvements in self-management to time, self-motivation, self-discipline, activation/concentration (Barkley & Murphy, 2011), emotional regulation and comorbid symptoms of ADHD, anxiety.

Table 1:

Observations of Efficacy and Acceptability of Mindfulness-Based Practices over 2 years

Date	Mindfulness-Based Practices	Observations
02.04.14		GPA: 2.0 LASSI Scores/100 Anxiety: 40 Attitude: 30 Concentration: 5 Information Processing:

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		Motivation: 10 Selecting main ideas: 40 Time Management: 15
02.25.14		I notice Connor lost awareness, that he quickly covered up
03.04.14	Introduce relaxation and journaling Concentration Exercise: Mind watch	Reduction in tension in body and thinking, calm, ache in left shoulder, left eye twitching. Homework: practice progressive relaxation
03.11.14	Mind watch	
03.18.14	Progressive Relaxation	Uses this during the week to calm himself after stressful group project
04.01.14	Educational	“I am stepping outside myself when I am hyper-focused”
04.08.14	Review	Victories list: higher GPA: 2.8 <ul style="list-style-type: none"> • Accepted into Business Program • Developed stronger relationships • Learned to concentrate better • Developed commitment and dedication to my studies • Finished all assignments • Large reduction in anxiety attacks.
09.15.14		LASSI Scores: Anxiety: 75 Attitude: 40 Concentration: 10 Information Processing: 80 Motivation: 60 Selecting Main Ideas: 60 Time Management: 35
09.23.14	Mind watch and reflection	Homework is to practice awareness of when he drifts off and to bring his focus back to the present moment.
09.30.14	Mind watch and reflection	Light bothered him, sensitive to light, spoke about his sensitivity to his environment and the emotions of others.
10.28.14	Visualization on Light with focus on breath	He was more confident about his upcoming presentation.
11.03.14 11.25.14		Developed strategy to step back when he feels stressed. “Visualize myself relaxed, take the problem and write it down and trust that this too shall pass.”

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11.18.14	Concentration: mind watch and journaling, tratak- focusing the gaze on an object	“I have more self-awareness, and am able to focus for longer periods of time.” Homework: practice driving home with more awareness (i.e. refrain from zoning out.) 2) practice reversing habits he is aware of.
12.11.14	Mind watch and reflection	<p>Victories for the semester: GPA: 3.7</p> <ul style="list-style-type: none"> • Self-reflection and mind watch have helped him to relax and is now stepping back from his emotional reactions and distractions, developing the observer mind. • “Able to maintain momentum and motivation throughout the semester, with a balance of work and life. Journaling helped me to process the stress, increased motivation, preserved my energy and develop more self- awareness. “
01.08.15	Mind watch and journaling	Connor is asking his own questions, and is making it a practice in his journaling. He would like to move beyond his opinions. He has become more rational and analytical. He will watch for when he is judgmental.
01.15.15		Awareness of self-criticism and fear of unknown. Observing how his opinions are obstacles to his learning. Using his “internal motivation” to focus on improving his communication.
02.04.15	Mind watch and progressive relaxation, journaling.	Now journaling regularly 5-30 minutes using a mind watch. He is noticing he is better at giving words to his ideas, improving his communication. He will now practice mind watch and journal writing before bed.
02.12.15	Mind watch 5, 10 and 15 minutes while focusing on the breath	Is continuing to bring his focus back to the object of concentration, i.e. the lecture, when he catches his mind beginning to wander. Improved communication
03.26.15	Mind watch focusing on breath. Visualization on light as an object to focus on.	The question that has set Connor on this path, is: Who am I? He thought initially that he would have to change but has found out that it was more about being more of who he really is.
04.02.15	Mind watch and journal. Identify new strategies to expand his journaling practice, such as identifying keywords. Dialogue with the aspect of procrastination.	
04.16.15		<p>Victories: GPA: 3.4</p> <ul style="list-style-type: none"> • Greater self-awareness and confidence • Clarity of speech, and increased concentration and focus • Self-Acceptance • More grounded due to practice of journaling.

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09.25.15	Mind watch (5 min) and Journal. Homework: Mind watch and journal daily, discriminate what is his issue and what belongs to another	Is interested in solving the puzzle of mind. Recognizes he is building neural pathways resulting in increased awareness, academic success and ease, memory, understanding of himself and others.
10.02.15	Mind watch (5 min) and journal. Homework: use an image to focus the mind and a positive, uplifting sound, i.e. OM	Connor is aware that the frequency of his practice is affected with how busy he is with school. He is aware of the distractions of sound and we talk about strategies for creating inner and outer silence.
10.09.15	2 Mind watches and journal reflections.	Connor is using visualization to help lower anxiety before presenting in his class. He is aware of the feeling of “overwhelm” with the many thoughts. The mind watch helps him make sense of all the thoughts, reducing anxiety.
10.16.15	Mind watch (5 min) and journal with questions: Where am I? Where do I want to go? What is changing?	Reflections on learning: <ul style="list-style-type: none"> • Now responding instead of reacting • More open to new experience and looking for like minded friends • Now in control of his mind • More impulse control • Is practicing “stop and think” • More positive and optimistic • Looking at a situation from many perspectives • More naturally conversational • Writing is improving
10.30.15	Mind watch (5 min) and journal reflections. Practice summarizing reflections into a nutshell. Homework: Psycho-education on ADHD and Mindfulness	Note taking reflects greater clarity, more direct due to focus, more spacious.
11.06.15	Mind watch, bringing in visualization on light, holding attention on image of his body as a vessel of light. Homework: practice visualization over the week.	The visualization helped Connor stay focused and present, reducing the number of thoughts. The practice brought up a memory.
11.20.15	Mind watch (5 min) and journal reflections.	Connor sees our work together as character building, developing focus and concentration and personal development, as well as reading and writing. He sees the mindfulness practices as a way to develop a new habit of watching his mind, and catching when he finds himself distracted or ruminating. He is now able to catch

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		himself sooner, thereby making a choice to switch his attention back to the object or task at hand.
12.04.15	Mind watch (5 min) and journal reflections. Continue practicing over the holidays.	Connor is more receptive, accepting of himself and others, and is using the practice to relax his mind. GPA: 3.35
01.12.16		LASSI Scores: /100 Anxiety: 90 Attitude: 50 Concentration: 15 Information Processing: 85 Motivation: 80 Selecting Main Ideas: 80 Time Management: 40

Discussion

In spite of the methodological weaknesses in clinical studies conducted to date, there is strong evidence that mindfulness based practices ameliorate symptoms of ADHD. The studies to date demonstrate that mindfulness based practice improves executive functioning and emotion dysregulation, reducing anxiety (worry/rumination), strengthening self-esteem, and improving quality of life in overlapping populations of adults and adolescents with ADHD; suggesting that this is a beneficial and effective intervention for university students with ADHD. Studies in neuroscience also confirm the role of mindfulness meditation in generating neuroplastic changes in the anterior cingulate cortex (ACC), associated with enhanced executive attention, as well as reducing the activity in the DMN region of the brain thought to be associated with ADHD. These clinical and neuroscience findings provide empirical evidence to support mindfulness based practices as an acceptable coaching strategy for students with ADHD in the university setting. According to the student practitioner, it was this “scientific” evidence to support the benefits of

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mindfulness meditation, that peaked his curiosity and willingness to experiment. Furthermore, the observations of the student practitioner, provide a lens into the role of mindfulness based practice as a tool to lower anxiety, increase motivation, time-management, and concentration, improving overall academic success represented by the GPA. These narrative reflections provide evidence of the effect of moving between these mindful states of awareness, including the ability to return attention back to an object of focus (attention regulation) resulting in clear thinking, while strengthening self-expression; and the enhanced ability to step back from difficult emotions, to evaluate and reappraise a “charged” event (emotional regulation). This reappraisal, reorients the practitioner from a negative habitual response to a positive, a perspective that extinguishes the charged event (Holzel et al., 2011). Holzel et al. (2011) refers to this extinction of emotion as “an unlearning of previous connections and thereby to liberation from being bound to habitual emotional reactions” (p. 547). The benefits of this practice for the student practitioner is improved relationships with family and friends, his ability to communicate clearly in difficult situations, and an increase in self-control.

Mindfulness based practices have also been shown to be acceptable to a wide audience of adolescents, adults, and university students (Tan, 2015; Zylowska et al., 2009; Mitchell et al., 2011 & Fleming et al., 2009) and that participants involved continued to practice after the study was completed, maintaining the positive outcomes over time (post assessments). Research conducted to date used an average of 8-10 weeks treatment time, while two studies ranged from a low of 5 to a maximum of 16 weeks (Tan, 2015). Clinical studies also have not investigated the effects of short intervals of MBPs over a longer duration of time, nor the practicality of this intervention as a self-initiated and sustained practice. The observations and reflections of the

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student practitioner provide evidence of the acceptability of brief (5-minute mind watch and 5 minute journal practice) mindfulness based practices over a 2-years period. Short periods of mindfulness meditation have been shown to improve attention and self-regulation (Tang, Ma, Wang, Fan, Feng & Lu, 2007), an advantage for restless young adults who have difficulty with sitting still and boredom. These results are influenced by the regular meetings, providing a place and time to practice with an experienced facilitator, maintaining a momentum of self-discipline. The sustainability of mindfulness based practice for university students with ADHD offers another dimension of investigation for future studies.

Limitations

There are several limitations in the research as many studies provide only preliminary data due to the absence of controls, randomization, small participant number, as well as different assessment and age-inappropriate measures across studies. Studies also used third party reports and clinician reports were not blinded (Tan, 2015). A clinical study by Jansen, Kan, Carpentier, Sizoo, Heparik et al. (2015) currently underway addresses these methodological limitations. Also, to date most studies do not consider the efficacy of mindfulness-based practices relative and/or additional to other psychosocial and behavioural programs (Tan, 2015). Baer (2003) recommends that studies be established to determine if the effectiveness of a treatment would be improved by the addition of mindfulness based practices. The results of the narrative study, provide preliminary evidence of the capacity of MBP as an effective and acceptable tool for university students to manage ADHD symptoms in combination with traditional coaching strategies, boosting academic success. Yet studies in ADHD coaching for university students (Prevatt &

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Yelland, 2013; Parker & Boutelle, 2009; Kubik, 2010) have not examined MBPs in conjunction with conventional strategies.

Several limitations are noted in the narrative study, due to a single participant, no before treatment measurement for mindfulness, except the LASSI report, absence of treatment effects over time, no control, nor a measurement of confounding variables such as other academic strategies and influence of the mindfulness facilitator. It was also impossible to measure other resiliency factors, such as family support, IQ, and the effect of pharmacology of the student practitioner. The strength of the study's findings lies in the words and insights of the practitioner, the LASSI scores as a measure of the effect of academic strategies and MBPs on the 5 factors of ADHD symptoms, and a review of recent clinical studies to support the efficacy and acceptability of MBPs as an intervention for university students with ADHD, which maybe useful in guiding future studies.

It is recommended that future studies clarify the role of mindfulness facilitator, such as hours of training, where they trained and with who, MBSR trained, etc. Janssen et al. (2015) fulfills this in the anticipated study of the efficacy of mindfulness based cognitive therapy for adults with ADHD, with a detailed *curriculum vitae* of the facilitator, such as 150 hours of education in MBSR/MBCT, continual training and minimum of three years of meditation practice (p.6). As a facilitator of mindfulness based practices there is a responsibility to remain actively engaged in the contemplative practices, using self-reflection as vigilant introspection of thoughts, actions and speech. The effect of the facilitator on the results of this study is difficult to

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measure, yet according to Kabat-Zinn (2003), these results are influenced by the out-of-practice sessions, and the experience of the mindfulness facilitator.

Conclusion

Students with ADHD, represent a growing number of young adults entering post-secondary schools where services are being developed on how to meet the needs of this population; academic coaching is one such service. Mindfulness based practices are effective and acceptable coaching strategies to assist university students, emerging adults (17-24) with ADHD for deficits in executive function, emotional regulation, inattention, and anxiety, which are essential for adapting into adulthood. Yet even with the considerable quantitative research in mindfulness meditation in the field of psychology, medicine, neuroscience, cognitive science, and education in the last 10 years there is a scarcity of research to support this claim among this growing population. The reflections of one student with ADHD who has embraced this contemplative tradition to understand how they might assist him in improving his life, school and relationships, provides initial evidence for further study . His words speak to the efficacy of these practices in combination with traditional academic strategies, to improve attention, concentration, motivation, emotional regulation, communication resulting in academic success. These words are potent, and future studies would benefit from the voice of the participant, whose experiences and narratives offer the potential for a new theoretical framework, measuring the benefits of mindfulness practices.

Mindfulness based practices complement academic strategies and offer students practical, effective and feasible tools to manage ADHD symptoms that influences several life domains.

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Mindfulness-based practices, the act of paying attention to the present moment with open acceptance, also offers immeasurable benefits such as compassion, insight, and wisdom, as well as a much needed compass to navigate the hectic life of a student, peacefully and with greater awareness.

The faculty of voluntarily bringing back a wandering attention over and over again, is the very root of judgment, character, and will. No one is *compos sui* (master of himself) if he have it not. An education, which should improve this faculty, would be the education par excellence. But it is easier to define this ideal than to give practical instructions for bringing it about.

William James, 1890

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References

- Ardila, A. (2008). On the evolutionary origins of executive functions. *Brain and Cognition*, 68, 92-99. doi: 10.1016/j.bandc.2008.03.003
- Baer, R. (2003). Mindfulness Training as a Clinical Intervention: A Conceptual and Empirical Review. *American Psychology Association*, 10, 125-143. doi: 10.11093/clipsy/bpg015
- Barkley, A.R. & Murphy, K.R. (2011). The Nature of Executive Function (EF) Deficits in Daily Life Activities in Adults with ADHD and Their Relationship to Performance on EF Tests. *Journal of Psychopathology Behavioral Assessment*, 33, 137-158. doi: 10.1007/s10862-011-9217-x
- Bishop, S., Lau, M., Shapiro, S., Carlson, L., Anderson, N.D., Carmody, J. et al. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice* 11(3), 230-241. doi:10.1093/clipsy/bph077
- Chiesa, A., Calati, R., & Serreti, A. (2011). Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review* 31, 449-464. doi: 10.1016/j.cpr.2010.11.003
- Creswell, J.W., (2009). *Research Design: Qualitative, quantitative, and mixed methods approaches* (3rd ed). Thousand Oaks, CA: Sage.
- Edel, M.-A., Holter, T., Wassink, K., & Juckel, G. (2014). A comparison of mindfulness-based group training and skills group training in adults with ADHD: An open study. *Journal of Attention Disorders* , 1-7. Retrieved from

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

<http://jad.sagepub.com.ezproxy.lib.ucalgary.ca/content/early/2014/10/07/1087054714551635.full.pdf+html>

Ergas, O. (2013). Mindfulness in education at the intersection of science, religion, and healing. *Critical Studies in Education*, 55 (1), 58-72. doi: 10.1080/17508487.2014.858643

Fleming, A., McMahon, R., Moran, L., Peterson, A., & Dressen, A. (2015). Pilot randomized controlled trial of dialectical behaviour therapy group skills training for ADHD among college students. *Journal of Attention Disorders*, 19 (3), 260-271. Retrieved from <http://jad.sagepub.com.ezproxy.lib.ucalgary.ca/content/19/3/260.full.pdf+html>

Fleming, A.P. & McMahon, R.J. (2012). Developmental Context and Treatment Principle for ADHD Among College Students. *Clinical Child and Family Psychology Review*, 15, 303-329. doi: 10.1007/s10567-012z

Harrington, A. & Dunne, J. (2015). When Mindfulness is Therapy, Ethical qualms, historical perspectives. *American Psychologist*, 70(7), 621-631. doi:org/10.1037/a0039460

Holzel, B., Lazar, S., Gard, T., Schuman-Olivier, Z., Vago, D.R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537-559. doi: 10.1177/1745691611419671

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

- Hasenkamp, W., Wilson-Mendenhall, C.C., Duncan, W., & Barsalou, L.W. (2012). Mind wandering and attention during focused meditation: A fine temporal analysis of fluctuating cognitive states. *NeuroImage* 59, 750-760. doi: 10.1016/J.neuroimage.2011.07.008
- Haydicky, J., Shecter, C., Wiener, J., & Ducharme, J. (2013). Evaluation of MBCT for adolescents with ADHD and their parents: Impact on individual and family functioning. *Journal of Child and Family Studies*, 21, 76-94. doi: 10.1007/s10826-013-9815-1
- James, William (1890). *The Principles of Psychology*. New York, NY: Henry Holt and Company.
- Janssen, L., Kan, C.C., Carpentier, P.J., Sizoo, B., Hepark, S., Grutters, J., et al. (2015). Mindfulness based cognitive therapy versus treatment as usual in adults with attention deficit hyperactivity disorder (ADHD). *BMC Psychiatry*, 15(216), 1-10. doi: 10.1186/s12888-015-0591-x
- Kabat-Zinn, J. (2011). Some Reflections on the origin of MBSR, skilful means, and the trouble with maps. *Contemporary Buddhism*, 12(1), 282-306. DOI: 10.1080/14639947.2011.564844
- Koerner, K. and Linehan, M.M. (2000). Research on Dialectical Behavior Therapy for Patients with Borderline Personality Disorder. *Psychiatric Clinics of North America*, 23(1), 151-167. doi: 10.1016/S0193-953X(05)70149-0
- Kubik, J.A. (2010). Efficacy of ADHD Coaching for Adults with ADHD. *Journal of Attention Disorders*, 13(5), 442-453. doi: 10.1177/1087054708329960

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

- Maharaj, Nisargadatta (1973). *I Am That, Talks with Sri Nisargadatta Maharaj*. Durham, NC: The Acorn Press.
- Makris, N., Biederman, J., Valera, E., Bush, G., Kaiser, J., Kennedy, et al. (2007). Cortical Thinning of the Attention and Executive Function Networks in Adults with Attention-Deficit/Hyperactivity Disorder. *Cerebral Cortex*, 17, 1364—1375. Retrieved from <http://cercor.oxfordjournals.org/>
- Mitchell, J., McIntyre, E., English, J., Dennis, M., Beckhan, J., & Kollins, S. (2013). A pilot trial of mindfulness meditation training for ADHD in adulthood: Impact on core symptoms, executive functioning, and emotion dysregulation. *Journal of Attention Disorders*, 20 (10), 1-16. Retrieved from <http://jad.sagepub.com.ezproxy.lib.ucalgary.ca/content/early/2013/12/04/1087054713513328.full.pdf+html>
- Mitchell, J.T., Zylowska, L., & Kollins, S. H. (2015). Mindfulness Meditation Training for Attention-Deficit/Hyperactivity Disorder in Adulthood: Current empirical support, treatment overview, and future directions. *Cognitive and Behavioural Practice* 22, 172-191. Retrieved from <http://ac.els-cdn.com.ezproxy.lib.ucalgary.ca/S107772291400128X/1-s2.0-S107772291400128X-main.pdf?>
- Moore, A. & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, 18, 127-186. doi: 10.1016/j.concog.2008.12.008

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

- Parker, D.R. & Boutelle, K. (2009). Executive Function Coaching for College Students with Learning Disabilities and ADHD: A new approach for fostering self-determination. *Learning Disabilities Research & Practice*, 24(4), 204-215. doi: 10.1111/j.1540-5826.2009.x
- Prevatt, F. & Yelland, S. (2015). An empirical evaluation of ADHD coaching in college students. *Journal of Attention Disorders*, 19(8), 666-677. Retrieved from <http://jad.sagepub.com.ezproxy.lib.ucalgary.ca/content/19/8/666.full.pdf+html>
- Schoenberg, P.L.A., Heparik, S., Kan, C.C., Barendregt, H.P., Buitelaar, J.K., et al. (2014). Effects of mindfulness-based cognitive therapy on neurophysiological correlates of performance monitoring in adult attention-deficit/hyperactivity disorder. *Clinical Neurophysiology*, 125, 1407-1416. doi: .org/10.1016/j.clinph.2013.11.031
- Shaw-Zirt, B., Popali-Lehane, L., Chaplin, W., and Bergman, A. (2005). Adjustment, Social Skills, and Self-Esteem in College Students with Symptoms of ADHD. *Journal of Attention Deficit Disorders*, 8(3), 109-120. doi: 10.1177/1087054705277775
- Sidlauskaite, J. Sonug-Barke, E., Roeyers, H. and Wiersema, J.R. (2015). Default mode network abnormalities during state switching in attention deficit hyperactivity disorder. *Psychological Medicine*, 46(3), 519-528. doi: 10.1017/S0033291715002019
- Sivananda, Swami (2007). *Sure Ways for Success in Life and God Realisation* (17th Ed.) . Tehri-Garhwal, India: Yoga Vedanta Forest Academy Press.

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

- Smalley, S.L., Loo, S., Hale, T.S., Shrestha, A., McGough, J. (2009). Mindfulness and Attention Deficit Hyperactivity Disorder. *Journal of Clinical Psychology*, 65(10), 1087-1098. doi: 10.1002/jclp.20618
- Tan, L. (2015). A critical review of adolescent mindfulness-based programmes. *Clinical Child Psychology and Psychiatry*, 1-15. doi: 10.1177/1359104515577486.
- Tan, L. & Martin, G. (2015). Taming the adolescent mind: a randomized controlled trial examining clinical efficacy of an adolescent mindfulness-based group programme. *Child and Adolescent Mental Health*, 20(1), 49-55. doi:10.1111/camh.12057
- Tan, L. & Martin, G. (2012). Taming the adolescent mind: Preliminary report of a mindfulness-based psychological intervention for adolescents with clinical heterogeneous mental health diagnoses. *Clinical Child Psychology and Psychiatry*, 18(2), 300-312. doi: 10.1177/1359104512455182
- Tang, Y.Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q. et al. (2007). Short-term meditation training improves attention and self-regulation. *Proceeding of the National Academy of Sciences of the United States of America*, 104(43), p. 17152-17156. doi: /10.1073/pnas.0707678104
- Van de Weijer-Bergsma. E., Formsma, A., de Bruin, E., & Bogels, S. (2012). The effectiveness of mindfulness training on behavioural problems and attentional functioning in adolescents. *Journal of Child and Family Studies*, 21, 775-787. doi: 10.1007/s10826-011-9531-7

MINDFULNESS BASED PRACTICE FOR UNIVERSITY STUDENTS WITH ADHD

- Wedlake, Marnie (2002). Cognitive Remediation Therapy for Undergraduates with ADHD. *The ADHD Report*: 10(5), 11-16.
- Weinstein, C.E., Palmer, D. and Acee, T.W. (2016). *Learning and Study Strategies Inventory (3rd ed.)*. Clearwater, FL: H&H Publishing.
- Zylowska, L., Ackerman, D., Yang, M. F., Horton, N., Hale, T., Pataki, C., et al. (2008). Mindfulness meditation training in adults and adolescents with ADHD, A feasibility study. *Journal of Attention Disorders* , 11(6), 737-746. Retrieved from <http://jad.sagepub.com.ezproxy.lib.ucalgary.ca/content/11/6/737.full.pdf+html>

Peer Review Revisions

Argument: I took a good look at your argument in comparison to Belcher's (2009) requirements for making a good argument beginning on pg. 82 and have come up with an idea for your argument as well as your entry point into the conversation on ADHD and mindfulness meditation with University students.

Belcher (2009) states that "an argument always has at least two parts: a claim and evidence for that claim" (p. 83). Your second sentence begins with "I will argue", but I wonder if this could be revised in such a way that you stake a firmer claim. For example by just stating, "Clinical studies done to date are insufficient to provide evidence for the benefits of mindfulness-based practices for university students as an academic strategy".

In regards to your argument, I would have to second Jenna's comment, as my first thought about the second half was that you are sounding doubtful and you want to be firm in your statement. I would remove the beginning of the sentence, "I will argue" to create a firmer sounding statement that is asserting yourself.

Your thoughts on your entry point are quite interesting and are growing my understanding for your topic. If you are focusing on the studies thus far being insufficient, then using the entry point of the lack of voice (perspective) in studies could be a good entry point, especially as it goes along with your argument statement.

- **This was an important suggestion, that took time to settle in my mind. The process of arriving at a favourable argument was supported by my cohorts throughout the semester. I responded to the peer review comment by creating a stronger argument, by using the suggestion from above.**

Title: Much of your paper regards the benefits of mindfulness based practices and how they can possibly be applied to university students. I wonder if your title could be re-worded, (ex. how MBP can be applied to university students) as your literature review is not solely focused on studies of university students. Or, is it possible to remove the word "academic strategy"?

- **I removed the term academic strategies.**

Suggestion to use full term for ADHD.

- **Several articles used the acronym and is commonly referred to as ADHD, therefore I did not change this.**

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Abstract: Belcher (2009) suggests that abstracts shouldn't include abbreviations, recommending that all terms be spelled out (p. 55). In regards to your abstract, I think you have supplied all of the key elements as suggested by Belcher (2009, p.55). I do wonder if it would be possible to be a bit more specific in regards to the methodology, as you state what your project is about (ingredients 2 and 3). You are informative in your first two sentences as you present the "why" of the project and the debate on the issue. I am wondering if it possible to add into this that it is an alternative approach or more strongly state that it is less frequently used to increase the impact of what you are trying to state.

- **I have added this to the abstract pointing out that it is a unique contribution.**

Also, would it be possible to somehow incorporate, though the findings scarce, if those that you have come across do state that mindfulness based practices have been found to be efficacious.

- **I chose not to say this, and instead extrapolated the evidence from other populations to university students.**

I hope these suggestions help. You have the content/ingredients, I am just wondering how you can build it to be impactful and argumentative.

You mention what your findings will provide, but it may help the reader if you identify succinctly what was found along with the conclusions you have drawn (Belcher, 2009, p.55).

- **I added a more succinct conclusion, identifying the findings.**

Introduction: You have stated your entry point clearly. Have you considered including a statistic or two to strengthen this statement?

- **Yes, I chose to move the statistic found later to the opening of the introduction.**

Be specific about the % of 'population'? Adult? child? youth? school? North America?

- **I have clarified this, stating it is the college population.**

Is it possible to shift this statement into two separate sentences, as it is long and can cause the reader to need to reread to be clear.

- **I made these ideas clearer by separating them into two sentences.**

Intent: Looking at the LT3 rubric section on context, is your intent to complete a literature review, develop an innovative mindfulness based program with which to introduce to your students or a combination of both?

- **My intention is to provide a literature review to support my argument, providing further evidence from a university student (co-author) of the efficacy and acceptability of MBPs as an academic strategy.**

Context: It appears throughout your paper that you are tackling a couple of these areas. Is it possible to clarify which area, whether it be specifically research-based or action-research oriented, that your study is most focused on. The use of Connor's statements causes me to lean towards action-research.

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- **For the purpose of this LT3 paper, I will focus on the literature review. (re: conversation with Aubrey.)**

Method: All of the items mentioned in this question are extremely important, I'm just wondering if there is a different way that you could word this question to provide clarity of meaning. I find myself reading and re-reading this sentence to make sure that I am understanding it clearly.

- **I rewrote this sentence to make it clearer.**

Could you use brackets for the "i.e." portion of the sentence therefore the reader is not trying to skip the example portion to complete the sentence and understand what the complete idea is?

- **Yes, I placed the i.e. in brackets.**

Theoretical Framework: Am I able to assume that this is where the literature review begins? If so, it may help the reader if you sign-mark where your literature review begins as currently this sub-heading leads me to believe that I am still reading the methodology of your paper.

- **I decided to move the theoretical framework to the methods section.**

In this section you are situating your own experiences with MBP which reveal many positives of such a practice. Could you clarify your purpose for sharing this information. Is it too provide insight for the reader into what MBP can look like? Or are you advocating for specific aspects of MBP as being the most effective for those with ADHD?

- **I have removed this for the purpose of this paper. (This is to specify the practice I use in my work and how it overlaps with Mindfulness based practices that are being used in the clinical studies. I will clarify this for the final submission.)**

When relating this information to your guiding questions I see that your focus has shifted a bit here, and it is not specific to university students. The transition to studies looking at adolescents impacts the flow of the paper somewhat as I am trying to connect this information with university students.

- **I clarified the investigation of adolescents and adults with ADHD, as representative of the overlapping age group of university students (17-24)**

I feel a bit lost in this sentence, possibly revise for clarity?

- **Revised by simplifying, removing unnecessary words.**

Could this be supported with a citation/reference? It is a very strong point you are conveying.

- **Yes, good point, I have supported this..**

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This section/paragraph has some great information as it relates to adolescents, can you find a way to create some links back to your argument related to university aged students? This is encouraged by Belcher (2009)- share facts and relate to your argument. "Make sure each section a paragraph relates to you single significant idea" (p.184).

- **Yes, I have made this clear in several areas of the paper, including the abstract.**

Pertinence to your study?

- **One study where I speak to its methodology, I make known that it is in reference to the challenges of conducting a thorough clinical quantitative study of the efficacy of mindfulness in a population of adults with ADHD.**

You connect the information to academics here which is great. Could it come a bit sooner? Could you perhaps be more specific and extend the statement, i.e.

- **I moved the position of this claim to the introduction.**

This role of exec control is an important capacity that influences several life domains, including academic success. This is of relevance as university ADHD students struggle with challenges such as mind wandering and it can affect their academic success. Use of such practices suggested in this study could greatly benefit students in university with ADHD.

- **This was a valuable suggestion by Jenna, that I used in my argument.**

This phrasing/hypothetical is somewhat confusing. Could you possibly rephrase? i.e. One could question what the results could have been if they had included daily MBP, as it currently continues to be left out in **I rephrased this**

You bring up important points related to ethical concerns and issues. It may be of value to consider placement for this content within the paper. Belcher (2009) articulates that this section is the most important and must be structured around your argument to ensure significance is articulated and made clear (p.195). Belcher (2009) reviews what should be included within the discussion in brief points on page 195 and 196. It would be beneficial to review these pages in week 7 to ensure your discussion has the strength and impact you hope for in the paper.

- **I reviewed Belcher's main points for a discussion. As a result, I have significantly improved the discussion by adding limitations of study, implications, significance**

Are you able to extend this somewhat to "take a step back" and relate it to the 'bigger picture' and why it matters in the "larger scheme of things" (Belcher, p.218)?

- **Yes, I have added a more global perspective on the importance of this study.**

Have you thought about adding any statements about possible direction for future research?

- **Yes, I have added future directions for further research.**

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Though this is draft, when going through final revisions and editing, refer to the APA publications manual 6th ed. for usage of punctuation such as comma, semicolon and dash (p. 88-90)

- **I did my best to correct use of punctuation.**