

Integrating Mindfulness into Mixed Martial Arts Training to Enhance Academic, Social, and Emotional Outcomes for At-Risk High School Students: a Qualitative Exploration

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Abstract Increasingly, adolescents report experiencing levels of stress that exceed their coping resources. Chronic stress is associated with emotion regulation challenges that increase risk for poor mental health and educational outcomes. This qualitative study examined the impact of Integra Mindfulness Martial Arts™ (Integra MMA™) on the perceived academic, social, and emotional outcomes of high school students at-risk for emotion regulation challenges. Twenty-four students (19 males and 5 females) aged 14–17 who participated in Integra MMA™ at a rural high school and their teachers ($N = 10$) were interviewed about Integra MMA™ and its perceived benefits. Thematic analyses of transcripts highlighted diverse positive student outcomes, including improved academic outcomes, social competence, emotion regulation, and self-confidence. Four key processes were also described (e.g., awareness, calm, attention, acceptance) as supporting positive change. Benefits were seen across students at low and high risk for mental health challenges and male and female students. Future research directions and implications for programming are discussed.

Keywords Mindfulness · High school · At-risk students · Intervention · Martial arts

Introduction

Recent statistics indicate that almost half of adolescents in the USA report that stress levels that exceed their coping capabilities (Bethune 2014). Stress during adolescence is important to consider, as this is a time of considerable development of the brain regions involved in responding to stress (e.g., hippocampus, medial prefrontal cortex, and amygdala; Ahmed et al. 2015). When faced with a stressor, an acute physiological stress response is initiated, known as the “fight or flight” response, which allows the individual to prepare the body to either “fight” (e.g., acting out, active non-compliance, aggression) or flee from the stressor (e.g., “flight” or avoidance; Cannon 1939). While this is a survival mechanism by design, it is also commonly triggered in the context of other perceived threats, including thoughts, feelings, task demands, and interactions that are perceived as challenging an individual’s emotional, social, or cognitive resources. When this system is engaged repeatedly, as in the case in the experience of chronic stress, it negatively impacts both the function and structure of these brain areas, making it even more challenging to manage stress (Romeo and McEwen 2006).

At a behavioral level, fight is often associated with aggressive responses whereas flight may be reflected in turning away from challenges (Ducharme and Harris 2005). Despite these differences, both fight and flight reflect *experiential avoidance* given their ability to shift the focus away from the experience of private thoughts, feelings, tasks, or behaviors by escaping or avoiding those experiences (Hayes et al. 1996). Experiential avoidance in response to stress has been associated with the development and maintenance of psychological disorders

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(Chawla and Ostafin 2007), including anxiety and aggression (Aldao et al. 2010; McLaughlin et al. 2011), as well as physical health problems (Frank et al. 2014), and poor educational outcomes (Hanson et al. 2004; Murray et al. 2007).

Mindfulness approaches have been increasingly adopted in high school settings to promote students' ability to manage stress, regulate emotions, and improve mental health and academic outcomes (Zenner et al. 2014). The central skill involved in mindfulness is the ability to pay attention to the present moment with non-judgmental observation and acceptance (Kabat-Zinn 2003). As such, mindfulness sets the stage for breaking patterns of experiential avoidance by promoting present focus rather than engagement in more reflexive patterns of fight or flight. Research suggests that mindfulness may in fact be an important *keystone* skill—a skill that, when taught, is associated with a broad range of positive changes that need not be directly targeted (Barnett et al. 1996). Studies support the positive impact of mindfulness training on high school student mood (Kuyken et al. 2013; Raes et al. 2014), emotional and behavioral outcomes (Huppert and Johnson 2010; Metz et al. 2013), and perceived stress (Metz et al. 2013).

Despite the promising outcomes associated with high school mindfulness programs, questions remain regarding who may benefit most from these programs. The majority of studies that have explored school-based mindfulness programs have been preventative or universal in nature, targeting the broad high school population (e.g., Bei et al. 2013; Huppert and Johnson 2010; Metz et al. 2013; Raes et al. 2014; Wisner and Norton 2013) rather than targeting students at-risk (i.e., those perceived by school staff, community counselors, and/or themselves to be at-risk for poor social emotional and/or academic outcomes). Outside of our own work with the current study sample (Milligan et al. 2016a, b), only two high school-based mindfulness studies primarily targeting students presenting with or at high risk for learning and/or mental health issues (e.g., Beauchemin et al. 2008; Edwards et al. 2014) have been published. It is critical to look at this population given their increased risk for compromised emotion regulation, mental health, and educational outcomes.

High school mindfulness programs have further primarily focused on mindfulness meditation as the core program component, with some incorporation of yoga (see Zenner et al. 2014 for review). It is possible that this may lead to differential engagement by gender. While the extant literature reflects a relative equivalence of genders across samples (e.g., Zenner et al. 2014), no studies have examined engagement patterns by gender in high school mindfulness programs and specifically if females are more likely to seek out, engage, and complete such programs. Certainly, research suggests that girls are more likely to seek out and engage in mental health services than boys (Barker et al. 2005) and research with adults has shown that women are more likely to engage in mindfulness practices than men (Olano et al. 2015). As such, a focus on school-

based interventions that promote engagement among male students within the high school setting may be warranted.

Integra Mindfulness Martial Arts™ (Integra MMA™), which integrates mindfulness treatment into milieu of a mixed martial arts training program, may be particularly useful for engaging male students in school-based mindfulness intervention given its use of mixed martial arts skill development, which is both socially valued and non-stigmatizing. Certainly, youth with or at-risk for mental health challenges often reflect on their desire to engage in “normal” developmentally appropriate activities (Wisdom et al. 2006) and to develop a sense of mastery (Milligan et al. 2015).

Briefly, Integra MMA™ consists of a parent orientation session, 20 weekly group sessions (1.5 h in length), and weekly brief (8-min) individual student-group leader sessions to set goals and discuss implementation of strategies in the student's life to promote generalization. Integra MMA™ mindfulness meditation practices focus on teaching students to increase their awareness of their thoughts and feelings and to practice acceptance and letting go of negative thoughts and experiences. Strategies include breath and body sensation awareness using the “mindful moment” (an adaptation of the 3-min breathing space developed by Segal et al. 2002), body scan, and sitting and walking meditations (see Milligan et al. 2015 for further information). These strategies allow students to remain present with challenge so that they can problem-solve how to address challenge rather than engaging in automatic responses of avoidance or aggression (fight or flight). Cognitive therapy strategies are integrated, including instructed use of self-talk statements to promote present focus. Therapeutic components are embedded into Ashtanga yoga and martial arts (i.e., muay thai kickboxing and Brazilian Jiu Jitsu) to provide students with lived experience and practice with the psychological strategies. Yoga requires slow strength movements and static postures that afford present moment awareness through training the breath. These physical challenges provide an opportunity to experience discomfort during posture performance and to practice staying present with challenge rather than engage in patterns of fight or flight. Mixed martial arts similarly presents physical challenge that must be observed and accepted but differs from yoga in that the movements are fast and more dynamic and afford the opportunity to hone skills in the context of interaction with another person (i.e., opponent; Milligan et al. 2015).

Integra MMA™ shares a similar philosophy with adventure-based counselling programs, such as Outward Bound. Challenges that arise in the context of activity (i.e., wilderness challenge or mixed martial arts) provide students with an opportunity to face challenge rather than engage in patterns of experiential avoidance and build a sense of mastery (DeMille and Montgomery 2016; Milligan et al. 2015, 2016a, b). See Table 1 for a description of the components of a typical class.

Previous research on Integra MMA™ delivered in a community-based clinical setting for youth with learning disabilities and co-occurring mental health issues has demonstrated a significant reduction in self-reported anxiety for adolescent boys presenting with anxiety at pre-treatment compared to a waitlist control and a significant decrease in parent-reported behavior problems for boys presenting with significant inattention and hyperactivity compared to a waitlist control group (Haydicky et al. 2012). Further, qualitative research findings suggest that the opportunity and experience of mastery in mixed martial arts facilitate engagement in therapy (Milligan et al. 2015).

The majority of research on Integra MMA™ has taken place in the clinic. Recently, we began implementing the program in a rural high school with at-risk students given the community's need to find mental health programs that would promote the engagement of at-risk male students. As such, there was a need to explore the acceptability of the school-based Integra MMA™ program, as well as its associated outcomes from the perspective of students and teachers. Given the exploratory nature of this research and the heterogeneity of academic and mental health issues experienced by at-risk high school students, we sought to identify key processes that students and teachers felt supported diverse student outcomes. For example, processes of change such as cognitive flexibility and experiential avoidance have been associated with improvements in anxiety, depression, negative self-evaluation, and somatic complaints after acceptance and commitment therapy (Livheim et al. 2015). This process-oriented approach was adopted to provide insight into mechanisms of change that may be meaningful in predicting diverse outcomes in of at-risk youth with diverse academic and mental health needs that could be used in future controlled quantitative research exploring the efficacy of Integra MMA™.

Method

Participants

Students identified as experiencing self-regulation challenges, including behavioral regulation difficulties, anxiety, anger management, and attention deficit hyperactivity disorder by educators and the community mental health agency partnering on the project, were invited to participate. To ensure that all students experiencing self-regulation challenges had an opportunity to participate, the invitation was also extended to students to self-refer at the high school orientation held at the beginning of the school year. An individual intake interview was completed with each student expressing interest in the program. During this interview, the group leader shared information about the program, gained information about the students' areas of strength and challenge, and assisted the

student in identifying goals for the program. Students who expressed continued interest and a commitment to attending the program were invited to take part. In total, 41 students participated in the 20-week mindfulness program (4 groups of 10–11 students). Of these, 36 students completed the mindfulness program, with 5 withdrawing due to lack of interest ($n = 2$ females) or change in school ($n = 2$ male, 1 female). For the current study, all 36 students who completed the program were invited to participate in a qualitative interview upon program completion. A total of 24 students (19 males, 5 females) completed the interview. Of the 24, 10 were referred from the local children's mental health agency, 9 were referred from the school, and 5 self-referred. All students were Caucasian. The remaining 12 students were unavailable for the interview either due to absence or scheduling challenges due to schoolwork. While SES data at the level of the student was not available, all students ($M_{\text{age}} = 14.87$, $SD = 0.95$) participating in this study lived in a rural area with no public transportation (with the exception of school buses) and high rates of poverty. The median family income is \$67,000, with approximately 13% of families with incomes below \$30,000 (Willms 2010). Informed consent was obtained from all individual participants included in the study.

The Child and Adolescent Needs and Strengths, Intake Version (CANS; Lyons 1999) semi-structured interview was administered to determine the presence of mental health challenges. Students were asked to rate challenges with anxiety, mood, attention/hyperactivity, impulse control, oppositional behavior, conduct disorder, adjustment to trauma, and substance use on a four-point scale (0, "no evidence"; 1, "history or subthreshold"; 2, "causing problems, consistent with diagnosable disorder"; and 3, "causing severe/dangerous problems"). Of the 24 students, 6 had symptoms consistent with a diagnosis (score of 2 or 3 on at least one disorder) and 8 had a history or subthreshold symptoms (score of 1 on at least one disorder). The remaining 10 did not report evidence of any of the psychological disorders but expressed desire to participate in the program. To allow for examination of the potential role of level of self-regulation challenge, students with scores consistent with a current diagnosis are labeled *high*, while those with no or subthreshold symptoms are labeled as *low* in this article.

Teachers who had taught students during the course of the mindfulness program were also invited by email to participate in a semi-structured focus group interview about their observations of and experiences with students participating in the mindfulness program. Three focus groups were completed with two to four teachers each. Ten teachers in total participated (seven women, three men). Teachers taught a range of courses, including English, math, business, hospitality, science, physical education, and history and had been teaching for a range of 2–29 years ($M = 13.28$, $SD = 9.72$). Overall teachers reported experience teaching 2–10 students who participated in Integra MMA™ ($M = 4.28$, $SD = 3.30$).

Table 1 Integra MMA™ treatment components

Treatment component	Group activities
Mindfulness and yoga (45 min)	Ashtanga yoga Mindfulness meditation Discussion/therapeutic lesson (e.g., “Everything changes, nothings stays the same”)
Mixed martial arts and active implementation of lesson and mindfulness skills (45 min)	Warm up and stretching Skill teaching and practice, including partnered drills Reminders are continuously provided about implementation of lesson and mindfulness skills while engaged in physical exercises

Procedure

Building on a partnership between a rural community-based children’s mental health agency and local high school, Integra MMA™ was implemented during the school day by a leader from each organization. Students were excused from regular course work during the period prior to lunch once a week to participate in the program. Teachers were informed about the Integra MMA™ program and its objectives and were asked to provide support to assist students with obtaining notes and catching up on missed course work. Integra MMA™ group leaders had training and experience in mixed martial arts and Ashtanga yoga and advanced therapy training in mindfulness. The Integra MMA™ group was led by two group leaders: one, a children’s mental health therapist with a social services worker diploma and 20 years of experience in the mental health field and the second, a high school teacher with a black belt in Karate and personal experience with mindfulness. Leaders were trained in Integra MMA™ and led all sessions. Group leaders received experiential training and ongoing training from one of the Integra MMA™ developers. This included co-leading a group and leading their own group with weekly supervision.

To gain a deeper understanding of the experience of youth completing Integra MMA™, semi-structured qualitative interviews were conducted. The interview guide was similar to that used in previous Integra MMA™ research (Milligan et al. 2015) and was adapted by the school Integra MMA™ evaluation team to ensure appropriateness of questions in terms of content and level. The interview was designed to explore student perceptions of program (e.g., “What did you like/not like about the MMA program?”) and perceived outcomes (e.g., What changes do you see in yourself now that you have completed MMA?). Specific probes were provided in each of these broad areas to support youth in reflecting on their experience. For example, probes related to perceived outcomes included how Integra MMA™ had helped the youth to solve problems and/or handle stress and challenges; to become more aware of thoughts and feelings;

to manage difficult/upsetting thoughts and feelings; and to handle change. Specific application probes were also included to assess changes in how youth manage interpersonal conflict, stress, anxiety, and anger (e.g., Has Integra MMA™ helped you handle stress or challenges?). Interviews were audiotaped and were typically 20–30 min in length. Students were given a food voucher for \$5.00 CAD for the school cafeteria.

Similar to the youth interview, the teacher interview was designed to be exploratory in nature and covered (1) their perceptions of students involved in Integra MMA™ (e.g., presenting issues) and (2) changes observed in students over the course of Integra MMA™. Specific probes were included to explore any changes noted in peer relationships, school engagement, independent on-task work, attention, class participation, attendance, managing stress, impulse control, and self-confidence. Interviews were audiotaped and were typically 30–45 min in length. Interviews were transcribed verbatim. To communicate appreciation for their time, teachers were provided with lunch when they attended the focus group.

Given the exploratory nature of this research, an inductive thematic analysis as described by Braun and Clarke (2006) was used to analyze interview transcripts. This approach enabled the identification of both explicit and implicit or underlying themes to highlight common outcomes described by participants. Using NVivo10 software, two researchers individually read each of the transcripts and coded responses and took notes on key themes. Both researchers have been involved in researching and/or delivering Integra MMA™ for 5 to 7 years and were previously employed by the agency where Integra MMA™ was developed. These themes were then discussed to ensure common interpretation and identification of key themes. Any discrepancies were resolved by consensus. This process allowed for investigator triangulation (i.e., the use of two or more investigators to examine the same phenomenon) in interpreting the data, thereby reducing the risk of biased interpretation. The study received approval by the Ryerson University Research Ethics Board.

Treatment Fidelity

Leader fidelity to the Integra MMA™ treatment manual was assessed. The majority of Integra MMA™ sessions were videotaped. Four sessions were randomly selected and analyzed using the treatment fidelity observation checklists used in previous MMA research (Milligan et al. 2015). Two research assistants were trained on the coding system by the principal investigator (KM) coded sessions. Inter-rater reliability for fidelity was high, averaging 98% agreement across session content and quality.

Adherence to the treatment manual was acceptable (90% of content items were completed). In most cases, instructors adapted the number of activities, such that not all mindfulness or martial arts practices were used to teach a particular skill were used in a given session (e.g., completed mindful walking with jab but not mindful walking just with breath). Treatment delivery was also assessed. Items included relational (e.g., providing praise), instructional (e.g., use of role play or modeling), and physical characteristics (e.g., lights out, use of bell) of session implementation, as well as the content of the session. Fidelity for treatment delivery was 86.3%, with variation found for items such as lights being off during meditation and students being expected to raise hand when they wish to talk and bow when they enter the room.

Results

Engagement and Acceptability

Of the 41 students who were referred and chose to participate in the program, only 2 females (5%), decided to discontinue the demanding 20-week program due to lack of interest, with all males remaining in the program. Acceptability of the Integra MMA™ program was further reflected in youth's response to being asked whether or not they would refer a friend to the program. Both low and high risk students said they would refer a friend or had already done so. For example, one student reported "Yes. Because, it helped me out so much and I know I have two or three friends that are even worse than me" (high, male). "Yeah. A lot of my friends are [now] doing it this session. So, I'm lending someone my gi [uniform]. They're excited about it." (low, female).

Student and Teacher Perceptions of Outcomes

Students and teachers reported a number of positive outcomes associated with school implementation of Integra MMA™, including improvement in academics, social competence, emotion regulation, and self-confidence. See Table 2.

Academic Performance Academically, teachers and students reported that they thought that more academic risks were being taken and more schoolwork was getting completed. For example, one student noted, "[MMA] reminded me that a lot of the time, what I think isn't always what's true and just to always not set limits for yourself in your head before you actually try" (low, male). They also provided examples of approaching schoolwork that had previously been associated with fight, flight or freeze reactions before MMA. "There was a final summative [assignment] for civics and I didn't think I was going to get it done, so I was stressed about that. Then I kind of used everything from MMA and just kind of went I will do my best. I will try to get it done. If I get it done-great, if not, I'll ask if I can have an extra day. I finished it!" (low, female). Similarly, teachers commented, "Their behavior is still there, but you can see them trying to work through it. There is that cognitive recognition that they're able to sit there and then listen to you and try and work through the problem. I don't think that was there, especially for some of them a year ago, just knowing the students from previous year to year."

Improved Social Competence For students who were more shy or withdrawn prior to Integra MMA™, an increase in approaching social interactions was noted. One student commented, "since I've been taking MMA I've found that I'm more out there" (high, male) and "Well, before I could barely stand around two people without having a panic attack because of my anxiety. But, now at least I can stand with my group of friends, which is about five" (low, male).

Teachers reported similar observations. For example,

[In class], he talked to me, but he wouldn't really talk to his peers. But, as the course went on he had more open posture towards the class as opposed to just sort of here and listening but not really turning and engaging. So, there was more engagement. And, he worked well when I put him in lab groups. He still wasn't really strong about initiating. I think I saw once where he asked somebody if he could work with him. But, he was more open posture-wise, to everything. When I said, okay, can you find a partner, he would turn. Whereas, before he would just kind of sit there and wait and know that I eventually would make something work for him.

Students also reported making friends in Integra MMA™ that often extended beyond the treatment group setting into broader school context, particularly for students who had experienced bullying or did not have a lot of friends. One student noted, "For once I actually felt like I fit and I was actually a human being instead of just an outcast" and that he was "actually becoming more popular" (high, male) because friends in Integra MMA™ were initiating interactions with him and introducing him to their friends. On the flip side,

Table 2 Themes relating to student outcomes from both the perspective of student and teacher

Outcome	Specific area of improvement
Academic performance	Work completion, persist with work, listen and focus in class, improved group work, decreased test anxiety
Social competence	Make friends, initiate interactions, decreased social anxiety
Emotion regulation	Improved ability to adaptively manage anger and anxiety
Self-confidence	Increased self-esteem, recognizing, and challenging negative self-talk

students who entered Integra MMA™ with friends found that their empathy and social perspective taking also improved. One student reflected,

Some people label others as jocks or preps and other people label others as...how do I put this...losers I guess. I wasn't really aware of that. [Now] I am a lot more aware of what people are calling each other...Last year there was a fight in the change room that nobody knew about and I just stood there and watched, and I probably shouldn't have. This year, there wasn't really a fight that I was in, but I feel like I would know what to do, I would know to stop the fight and not just let it continue like I did last year (low, male).

Teachers similarly reported that interactions with peers and teachers became more adaptive and appropriate. "He'll talk to other kids and not just do it, as like before it would be he'd talk to other kids but do it like a shock factor thing, so he'll actually with conversation or with teachers and stuff that he's had for the semester he's very respectful and that, so just yeah, way more confident." Similarly, they noted about one female participant, "When she was in the younger grade she was anxious to fit in, not always appropriate, and now she's not withdrawn but she's decided where she wants to be and who she wants to be with, and does her work and cooperates and is in her own more quiet space. But, it seems like more her own space than it was before."

Improved Emotion Regulation In terms of emotion regulation, students shared their experiences with two primary emotions—anger and anxiety—and reflected on how these impacted their relationships before and after Integra MMA™. Students presenting with anger management problems reported improvements after taking Integra MMA™ in relation to managing anger and commented on the impact this had on their relationships with others. For example, one student noted, "My family isn't afraid to be around me anymore. Because I had major problems, where I would like actually hurt someone and now I don't do that anymore." (high, male). Similarly, another student reflected "Well me and my grandma fight or whatever, or me and my mom. When they're fighting or yelling at me or something, now I don't react in a bad way or something, to get myself into more trouble, I kind of like

calm down and go to my room and just think yeah think before I say [anything]." (high, female).

Teachers also observed improvement in behavior. For example, one teacher shared,

One of [my student's] biggest problems is containing that energy and not just saying what he thinks and doing what he wants. And he is just like a, he's like a mini volcano, just constantly erupting, usually verbally. Now... he's very verbal and still has outbursts, there's no doubt about it, but someone has shown him at least one way, that in a positive way, how he can release that energy and not disrupt the class. Anyone who has probably seen him from first semester to second semester would see a change.

Improvement in anger management was also seen in students presenting with lower levels of mental health issues, for example one student reported,

I had finished these three projects that were due on the same day, on Sunday, and my mother broke the computer that they were saved on. And the e-mail crashed and both of my backups were gone, so I had to redo them all in a night. And well that was pretty stressful and I was pretty angry at my mother, and MMA helped me deal with that, I had a mindful moment and a mindful self-talk. I ended up getting all the stuff done (low, male).

Improved Self-Confidence Students and teachers noticed changes in self-confidence during the course of Integra MMA™. For example, students shared "MMA makes me actually like myself more than what I have, because I used to hate myself and was so depressed all the time." (high, male). Similarly, another student noted, "I used to have really low self-esteem 'cause I've been bullied since grade 1...so naturally, my self-esteem went down a lot. It's changed extremely" (high male). Students shared how they used the strategies to build confidence, "Every time I find myself talking negatively about myself and whatnot, I tend to just think of one of like skillful means or self-talk that will help me stop" (high, male). They noted when facing a challenge

they may feel “still sad, but not defeated” (low, male). Similarly, teachers reported, “I could see him gaining confidence as he went through the program” and remarked that increases in confidence underlined the “huge improvements” seen self-regulation and social interaction.

Student Perceptions of Key Processes Underlying Positive Outcomes

While the specific challenges experienced differed between students, there were four key processes, namely awareness, calm, attention, and acceptance, that appeared to support students in making diverse academic, social, and emotional gains. See Table 3.

Awareness Many of the students found that Integra MMA™ assisted them in becoming more aware of themselves and their environment, as well as their behavior and feelings. For example, one student noted, “You get to learn about yourself. You get a deeper understanding of what you really are thinking about and how to control your feelings” (low, male). Many students noted being able to identify when they were practicing avoidant behavior, such as fight, flight, or freeze, and that this awareness helped them to change their behavior. For example, one student noted, “So if you’re in your fight—you’re being aggressive. If you’re in flight—you run away. If you freeze—you’re just stuck there. That, kind of, makes me more aware of what I’m doing in an argument or what I’m doing in just normal life” (high, male).

Calm Students also noted that Integra MMA™ helped them “calm down” in the face of stress. For example, one student shared his experience of a stressful interaction with his family, “I was just so frustrated. I wasn’t thinking straight, so when I did the meditation that night it helped me like calm down and realize what I’m actually doing” (high, male). Similarly, another student reported, “You can calm yourself down before doing something you will kind of regret doing” (high, male). Another student shared how increasing the sense of calm helped with schoolwork, “When I was doing my math exam and stuff like that, a few spots I was kind of like iffy and then I would just stop and relax and do one of those mindful-moment things that we were taught. It just helped my mind like kind of clear of all the cluttered stuff—like I was trying to think of everything at once.” (low, male).

Attention In addition to improved awareness and sense of calm, students reported having improved attention and being better able to concentrate in class. “I can focus in on certain things you know a lot easier. Before in class my mind would wander everywhere and I would be thinking about things that had nothing to do with the class. Now I can actually zone in to what the teacher is talking about and I can take notes easily, I

can think about what’s going on” (high, male). Focusing on breathing was reported to help “zoning in” and bringing attention back to the present moment.

Acceptance Students shared how increasing their ability to accept challenging situations helped them to move forward. For example, one student shared, “I failed a test recently so I just did like a mindful moment and I thought about it, and I came to acceptance with the fact that I failed, and I can do better—I can try next time” (low, male). Similarly, another student noted increased ability to “let go of certain problems that were just dragging” them down (high, male).

Change Takes Time

When commenting about the positive changes seen (outcome and process), both students and teachers reflected that change takes time, but that Integra MMA™ helped to initiate a path towards increased success. For example, one student noted “The anger definitely doesn’t go away but helps me better manage it” (high, male). Similarly, teachers reported,

There are still certainly days when we hit three strikes quickly but he’s aware of them, and the really neat thing is that in the last two weeks he’s kind of got one and he says can I go for a walk now, I don’t want to get second and third. So that’s where I’ve seen the changes; he’s just moving that awareness more and more to taking it on himself rather than needing that external kind of notification of this is what’s going on, which is good.

Similarly, another teacher noted,

I think that we’re planting a good foundation or building a good foundation with her, but she’s got the terminology, but she hasn’t been able to kind of grab hold of it. But, I think it’s a maturity thing too. I think that for some of them we probably won’t see its full effects. If she can still hold onto some of the stuff that she learned this year, I think that you will see that along the way. If you look at the small picture, it can be a little bit frustrating that you’re like, you’ve been doing this all semester and it doesn’t seem as though it’s done something, but there are moments when you see it and if it keeps going, I think that it will have greater effects.

Discussion

Learning to adaptively manage stress and negative emotion is a keystone skill that assists adolescents in meeting developmental goals spanning academic and social domains. This

Table 3 Processes that support positive Integra MMA outcomes based on student perspective

Process	Examples of processes in action
Awareness	Learn about self, recognize “fight, flight, or freeze”
Attention	Focus, concentration, less distracted
Calm	Calm, relax, and stay present in the face of challenge or stress
Acceptance	Accept challenges or negative outcomes without getting stuck in them; non-judgmental, allows you to move forward and do better next time

qualitative study built upon the extant literature examining high school mindfulness programs by examining processes and outcomes associated with a martial-based mindfulness program (Integra MMA™) designed to engage at-risk students who might not otherwise access therapeutic supports.

Findings support the acceptability of the school-based Integra MMA™, as evidenced by both high and low risk students’ desire to recommend the program to friends and siblings, and its ability to engage at-risk students, particularly at-risk males. These results replicate findings of a growing literature supporting the acceptability and effectiveness of high school-based mindfulness interventions. Further research is needed to compare the acceptability of a mixed martial arts program vs. a more a traditional mindfulness meditation program to discern if the martial arts component enhances treatment engagement and completion and generalization and implementation of skills outside of the program.

Consistent with the extant literature, students and teachers reported observing changes in self-confidence (Schonert-Reichl and Lawlor 2010), regulation of negative emotions, such as anxiety and anger (Beauchemin et al. 2008; Edwards et al. 2014; Metz et al. 2013; Wisner and Norton 2013), and academic engagement and performance (Beauchemin et al. 2008; Franco et al. 2010; Wisner and Norton 2013). For example, use of mindfulness within the classroom context was reported by students and teachers to be particularly helpful with improving attention (i.e., focus and concentration). While attention has been explored in elementary school populations (Black and Fernando 2014; Parker et al. 2014; Klatt et al. 2013), few studies have examined these outcomes with high school students (Metz et al. 2013). Further, mindfulness strategies were helpful in contexts that students perceived as stressful, including test-taking, assignment completion under the pressure of deadlines, and social-academic demands, such as presentations and finding a partner for class assignments. Importantly, the qualitative approach to this study allowed for the unpacking of the concept of academic performance to better understand specific situations that high school students were able to use the skills learned in Integra MMA™.

Socially, participation in Integra MMA™ helped students to approach social interactions, including being more open, initiation of interactions, and a willingness to stand up for others, as well as manage impulses and anger in the context of stressful interactions with family, peers, and teachers. These

social, interpersonal, and emotional gains are consistent with school and clinic-based mindfulness research completed with students with learning disabilities (Beauchemin et al. 2008; Haydicky et al. 2012). These results may be helpful to practitioners in terms of designing mindfulness interventions (e.g., specific situational examples to include) and to researchers in determining where and what outcomes to measure to determine the effectiveness of a given intervention.

A primary objective of this research was to extend the exploration of outcomes to the level of process-related changes that support positive social, academic, and emotional outcomes to may be common to students despite heterogeneity in presenting issues. Students discussed that improvement in the four key processes of self-awareness, sense of calm, attention, and acceptance was associated with participation in Integra MMA™. These improvements helped students to stay present with challenges involving academic and social interactions associated with anxiety and anger. Further, the experience of success in and outside of Integra MMA™ led to observable increases in self-confidence, which appeared to further reinforce progress in the four key processes. This model is consistent with Wisner (2014) who explored process and behavioral level outcomes associated with a school-based mindfulness program for students attending an alternative school for high risk youth. Using concept mapping methodology, Wisner highlighted the association between mindfulness and sense of calm, enhanced self-awareness, and improved attention. While this study did not explicitly look at the inter-relation between the themes (or clusters on the concept map), examination of the concept map and the relative placement of clusters provides some insight into the inter-relations. Specifically, it is telling that improved stress management, self-awareness, state of mind, and attention were at the foundation of the concept map, supporting a sense of calm in the center of the map which pointed towards enhanced emotional coping, improved school climate, and improved self-regulation outcomes. This is also consistent with Monshat et al. (2013) who found that mindfulness helped participants move from a feeling of distress and over-reactivity to a sense of inner calm and agency in managing emotions, which in turn promoted clarity of mind and an enhanced sense of competence.

For our participants, the experience of approaching academic and social challenge and experiencing mastery was further associated with enhanced self-confidence, with

students saying that they liked themselves more and teachers commenting that students did not need to engage in acting out behaviors as a means of coping with negative feelings about themselves. The relation between mindfulness and self-compassion (i.e., the ability to be kind to oneself in the face of challenge or failure) is well established in the literature (e.g., Hollis-Walker and Colosimo 2011).

In turn, self-compassion has been associated with positive outcomes, including enhanced well-being (Neff and McGehee 2010), decreased anxiety (Neff et al. 2007), and improved academic outcomes (Neff et al. 2005). For example, in two studies examining self-compassion in undergraduate students, Neff et al. (2005) found that self-compassion was associated with mastery goals or the idea that one can benefit from things and find pleasure even if things are hard or they make mistakes. In contrast, self-compassion was negatively associated with performance-oriented goals that reflected just doing well or avoiding doing poorly or being perceived poorly. Further, students with this mindset were more likely to stay present with and cope with negative emotions associated with failing a midterm exam rather than engage in avoidance or aggression-related coping or “fight or flight.”

While the results of this study provide further insight into the academic, social, and emotional outcomes associated with participation in high school implementation of Integra MMA™, as well as increase specificity in terms of our knowledge of process-related changes that may support heterogeneous outcomes, there are a number of limitations that warrant attention in future research. First, both students and teachers self-selected to participate in the interview process which may have biased the findings towards seeing gains. When discussing student outcomes during the qualitative interviews, teachers did not specifically identify students. As such, we were unable to address the potential moderating role of individual student characteristics in teacher-derived themes, such as severity of mental health needs. Second, the ability of the program to engage at-risk male students may have been biased by the referral patterns of the school and community mental health staff. Future research is needed that explores the rates of engagement for at-risk males who self-refer, who may be more advanced in terms of their readiness for change (Prochaska et al. 1994), as well as exploration of system-level practices that may support engagement for those who may be in earlier stages of readiness for change (e.g., pre-contemplative, contemplative, Prochaska et al. 1994). Third, attendance and home practice data was not collected for the present study. It is possible that these indices of engagement may moderate outcomes and as such are important to assess (Rosenzweig et al. 2010). Fourth, interviews were completed at the end of the program without a follow-up. This limited our ability to explore the maintenance of gains or if “seeds planted” resulted in further gains over time. Finally, the current study did not explore the feasibility of implementation or

specific contextual factors that may support or hinder implementation in the school setting thereby impacting on student outcomes. For example, teacher positive support and encouragement to engage in mindfulness have been shown to improve student outcomes (Viafora et al. 2015). We are currently completing research to explore these specific factors, with preliminary qualitative work highlighting the importance of program delivery elements such as scheduling, length of class, physical space, mixed-sex group membership, and adaptation/specification of content for school setting, as well as system-related factors, including communication and system-wide strategies for increasing generalization (Meixner et al. 2015).

In addition to these limitations, it is important to highlight that the Integra MMA™ involves multiple components that may facilitate change. While mindfulness is positioned as a core therapeutic component that may facilitate change, it is possible that other components also have an important influence. For example, both martial arts and exercise have been associated with gains in attention (Diamond and Lee 2011; Diamond 2012; Lakes et al. 2013) and group membership within a supportive environment can also influence treatment outcomes (Milligan et al. 2016a, b). Future controlled research that compares Integra MMA™ to a supportive group treatment or to an exercise or martial arts only control group is needed to better understand the influence of each of the components of the Integra MMA™ program on outcomes.

In conclusion, adolescent mental health is a growing concern. Mindfulness programs provided at school may help to ameliorate some of the risk and place students on more positive social, emotional, and academic trajectories. Integrating mindfulness into a socially valued activity, such as mixed martial arts, may improve engagement in school-based mental health programming, particularly for male students and/or those at-risk. Integra MMA™ appears to provide a means by which attention, awareness, calm, and acceptance can be fostered to improve a broad range of academic, social, and mental health outcomes in a manner that may capture the interest and engage students at-risk.

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Compliance with Ethical Standards

Conflict of Interest All authors declare that they have no conflict of interest.

Ethical Approval This article does not contain any studies with animals performed by any of the authors. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standard.

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References

- Ahmed, S. P., Bittencourt-Hewitt, A., & Sebastian, C. L. (2015). Neurocognitive bases of emotion regulation development in adolescence. *Developmental Cognitive Neuroscience, 15*, 11–25. doi:10.1016/j.dcn.2015.07.006.
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: a meta-analytic review. *Clinical Psychology Review, 30*, 217–237. doi:10.1016/j.cpr.2009.11.004.
- Barker, G., Olukoya, A., & Aggleton, P. (2005) Young people, social support and help-seeking. *International Journal of Adolescent Medicine and Health, 17*(4), 315–335.
- Barnett, D. W., Bauer, A. M., Ehrhardt, K. E., Lentz, F. E., & Stollar, S. A. (1996). Keystone targets for change: planning for widespread positive consequences. *School Psychology Quarterly, 11*, 95–117. doi:10.1037/h0088923.
- Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities. *Complementary Health Practice Review, 13*, 34–45. doi:10.1177/1533210107311624.
- Bei, B., Byrne, M. L., Ivens, C., Waloszek, J., Woods, M. J., Dudgeon, P., ... & Allen, N. B. (2013). Pilot study of a mindfulness-based, multi-component, in-school group sleep intervention in adolescent girls. *Early Intervention in Psychiatry, 7*(2), 213–220.
- Bethune, S. (2014). Teen stress rivals that of adults. *Monitor on Psychology, 45*, 20 Retrieved from <http://www.apa.org/monitor/2014/04/teen-stress.aspx>.
- Black, D. S., & Fernando, R. (2014). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school children. *Journal of Child and Family Studies, 23*, 1242–1246. doi:10.1007/s10826-013-9784-4.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101. doi:10.1191/1478088706qp0630a.
- Cannon W. B. (1939). *The wisdom of the body*. New York: W.W. Norton.
- Chawla, N., & Ostafin, B. (2007). Experiential avoidance as a functional dimensional approach to psychopathology: An empirical review. *Journal of Clinical Psychology, 63*(9), 871–890.
- DeMille, S. M., & Montgomery, M. (2016). Integrating narrative family therapy in an outdoor behavioral healthcare program: a case study. *Contemporary Family Therapy, 38*(1), 3–13. doi:10.1007/s10591-015-9362-6.
- Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science, 21*(5), 335–341. doi:10.1177/0963721412453722.
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science, 333*(6045), 959–964. doi:10.1126/science.1204529.
- Ducharme, J. M., & Harris, K. (2005). Errorless embedding for children with on-task and conduct difficulties: Rapport-based success-focused intervention in the classroom. *Behavior Therapy, 36*, 213–222.
- Edwards, M., Adams, E. M., Waldo, M., Hadfield, O. D., & Biegel, G. M. (2014). Effects of a mindfulness group on Latino adolescent students: examining levels of perceived stress, mindfulness, self-compassion, and psychological symptoms. *The Journal for Specialists in Group Work, 39*, 145–163. doi:10.1080/01933922.2014.891683.
- Franco, C., Mañas, I., Cangas, A. J., & Gallego, J. (2010). The applications of mindfulness with students of secondary school: results on the academic performance, self-concept and anxiety. In M. D. Lytras, P. O. De Pablos, A. Ziderman, A. Roulstone, H. Maurer, & J. B. Imber (Eds.), *Knowledge management, information systems, E-learning, and sustainability research* (pp. 83–97). Heidelberg: Springer.
- Frank, J. L., Bose, B., & Schrobenuhauser-Clonan, A. (2014). Effectiveness of a school-based yoga program on adolescent mental health, stress coping strategies, and attitudes toward violence: findings from a high-risk sample. *Journal of Applied School Psychology, 30*, 29–49. doi:10.1080/15377903.2013.863259.
- Hanson, T. L., Austin, G., & Lee-Bayha, J. (2004). Ensuring that no child is left behind. How are student health risks & resilience related to the academic progress of schools? *WestED (NJ3)*. Retrieved from <http://eric.ed.gov/?id=ED486329>
- Haydicky, J., Wiener, J., Badali, P., Ducharme, J. M., & Milligan, K. (2012). Evaluation of mindfulness-based intervention for adolescents with learning disabilities and co-occurring ADHD and anxiety. *Mindfulness, 3*, 151–164. doi:10.1007/s12671-012-0089-2.
- Hayes, S. C., Wilson, K. W., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*(6), 1152–1168.
- Hollis-Walker, L., & Colosimo, K. (2011). Mindfulness, self-compassion, and happiness in non-meditators: a theoretical and empirical examination. *Personality and Individual Differences, 50*, 222–227. doi:10.1016/j.paid.2010.09.033.
- Huppert, F. A., & Johnson, D. M. (2010). A controlled trial of mindfulness training in schools: the importance of practice for an impact on well-being. *Journal of Positive Psychology, 5*, 264–274. doi:10.1080/17439761003794148.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice, 10*, 144–156. doi:10.1093/clipsy.bpg016.
- Klatt, M., Harpster, K., Browne, E., White, S., & Case-Smith, J. (2013). Feasibility and preliminary outcomes for Move-Into-Learning: an arts-based mindfulness classroom intervention. *The Journal of Positive Psychology, 8*, 233–241. doi:10.1080/17439760.2013.779011.
- Kuyken, W., Weare, K., Ukoumunne, O. C., Vicary, R., Motton, N., Burnett, R., Cullen, C., Hennelly, S., & Huppert, F. (2013). Effectiveness of the mindfulness in schools programme: non-randomised controlled feasibility study. *The British Journal of Psychiatry, 203*, 126–131. doi:10.1192/bjp.bp.113.126649.
- Lakes, K. D., Bryars, T., Sirisinal, S., Salim, N., Arastoo, S., Emmerson, N., et al. (2013). The healthy for life taekwondo pilot study: a preliminary evaluation of effects on executive function and BMI, feasibility, and acceptability. *Mental Health and Physical Activity, 6*(3), 181–188. doi:10.1016/j.mhpa.2013.07.002.
- Livheim, F., Hayes, L., Ghaderi, A., Magnusdottir, T., Högföldt, A., Rowse, J., et al. (2015). The effectiveness of acceptance and commitment therapy for adolescent mental health: Swedish and Australian pilot outcomes. *Journal of Child and Family Studies, 24*(4), 1016–1030. doi:10.1007/s10826-014-9912-9.
- Lyons, J. (1999). *Child and adolescent needs and strengths*. Chicago: The Praed Foundation.
- McLaughlin, K. A., Hatzenbuehler, M. L., Mennin, D. S., & Nolen-Hoeksema, S. (2011). Emotion dysregulation and adolescent psychopathology: a prospective study. *Behaviour Research and Therapy, 49*, 544–554. doi:10.1016/j.cpr.2009.11.004.
- Meixner, T., Irwin, A., Wolfe-Miscio, M., Hamilton, L., Cox, M., Woon, S., Gage, M., Mintz, L., & Milligan, K. (2015). *Integra mindfulness martial arts: an exploration of themes for implementation in a school setting*. Poster presented at the meeting of the Canadian Psychological Association (CPA), Ottawa.

- Metz, S. M., Frank, J. L., Reibel, D., Cantrell, T., Sanders, R., & Broderick, P. C. (2013). The effectiveness of the learning to BREATHE program on adolescent emotion regulation. *Research in Human Development, 10*, 252–272. doi:10.1080/15427609.2013.818488.
- Milligan, K., Badali, P., & Spiroiu, F. (2015). Using mindfulness martial arts to address self-regulation challenges in youth with learning disabilities: a qualitative exploration. *Journal of Child and Family Studies, 24*, 562–575. doi:10.1007/s10826-013-9868-.
- Milligan, K., Irwin, A., Wolfe-Miscio, M., Hamilton, L., Mintz, L., Cox, M., et al. (2016a). Mindfulness enhances use of secondary control strategies in high school students at risk for mental health challenges. *Mindfulness, 7*(1), 219–227. doi:10.1007/s12671-015-0466-8.
- Milligan, K., Phillips, M., & Morgan, A. S. (2016b). Tailoring social competence interventions for children with learning disabilities. *Journal of Child and Family Studies, 25*(3), 856–869. doi:10.1007/s10826-015-0278-4.
- Monshat, K., Khong, B., Hased, C., Vella-Brodrick, D., Norrish, J., Burns, J., & Herrman, H. (2013). “A conscious control over life and my emotions:” mindfulness practice and healthy young people. A qualitative study. *Journal of Adolescent Health, 52*, 572–577. doi:10.1016/j.jadohealth.2012.09.008.
- Murray, N. G., Low, B. J., Hollis, C., Cross, A. W., & Davis, S. M. (2007). Coordinated school health programs and academic achievement: a systematic review of the literature. *Journal of School Health, 77*, 589–600. doi:10.1111/j.1746-1561.2007.00238.
- Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and Identity, 9*, 225–240. doi:10.1080/15298860902979307.
- Neff, K. D., Hsieh, Y. P., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity, 4*, 263–287. doi:10.1080/13576500444000317.
- Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality, 41*(1), 139–154. doi:10.1016/j.jrp.2006.03.004.
- Olano, H. A., Kachan, D., Tannenbaum, S. L., Mehta, A., Annane, D., & Lee, D. J. (2015). Engagement in mindfulness practices by US adults: sociodemographic barriers. *The Journal of Alternative and Complementary Medicine, 21*(2), 100–102.
- Parker, A. E., Kupersmidt, J. B., Mathis, E. T., Scull, T. M., & Sims, C. (2014). The impact of mindfulness education on elementary school students: evaluation of the Master Mind program. *Advances in School Mental Health Promotion, 7*, 184–204. doi:10.1080/1754730X.2014.916497.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., ... & Rossi, S. R. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health psychology, 13*(1), 39.
- Raes, F., Griffith, J. W., Van der Gucht, K., & Williams, J. M. G. (2014). School-based prevention and reduction of depression in adolescents: a cluster-randomized controlled trial of a mindfulness group program. *Mindfulness, 5*, 477–486. doi:10.1007/s12671-013-0202-1.
- Romeo, R. D., & McEwen, B. S. (2006). Stress and the adolescent brain. *Annals of the New York Academy of Sciences, 1094*(1), 202–214. doi:10.1196/annals.1376.022.
- Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: variation in treatment outcomes and role of home meditation practice. *Journal of Psychosomatic Research, 68*(1), 29–36. doi:10.1016/j.jpsychores.2009.03.010.
- Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre-and early adolescents’ well-being and social and emotional competence. *Mindfulness, 1*, 137–151. doi:10.1007/s12671-010-0011-8.
- Segal, Z., Williams, J., & Teasdale, J. (2002). *Mindfulness-based cognitive therapy for depression—a new approach to preventing relapse*. New York: Guilford Press.
- Viafora, D. P., Mathiesen, S. G., & Unsworth, S. J. (2015). Teaching mindfulness to middle school students and homeless youth in school classrooms. *Journal of Child and Family Studies, 24*, 1179–1191. doi:10.1007/s10826-014-9926-3.
- Willms, J. D. (2010). *Understanding the early years –Kawartha Lakes and Haliburton County, Ontario: a community research report*. Canada: Government of Canada Publications.
- Wisdom, J. P., Clarke, G. N., & Green, C. A. (2006). What teens want: barriers to seeking care for depression. *Administration and Policy in Mental Health and Mental Health Services Research, 33*(2), 133–145. doi:10.1007/s10488-006-0036-4.
- Wisner, B. L. (2014). An exploratory study of mindfulness meditation for alternative school students: perceived benefits for improving school climate and student functioning. *Mindfulness, 5*, 626–638. doi:10.1007/s12671-013-0215-9.
- Wisner, B. L., & Norton, C. L. (2013). Capitalizing on behavioral and emotional strengths of alternative high school students through group counseling to promote mindfulness skills. *The Journal for Specialists in Group Work, 38*, 207–224. doi:10.1080/01933922.2013.803504.
- Zenner, C., Hermleben-Kurz, S., & Walach, H. (2014). Mindfulness-based interventions in schools—a systematic review and meta-analysis. *Frontiers in Psychology, 5*, 603.

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