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## Mindfulness Based Programs Implemented with At-Risk Adolescents

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### Abstract:

#### Objective:

This review examines studies on mindfulness based programs used with adolescents at-risk for poor future outcomes such as not graduating from high school and living in poverty.

#### Method:

The keywords used include mindfulness, at-risk and adolescents in each database to search CINAHL (10 items: 2 book reviews, 3 Dissertations, and 5 research articles), Medline EBSCO (15 research articles), and PubMed (10 research articles). Only primary research articles published between 2009- 2015 in English on mindfulness and at-risk adolescents were included for the most current evidence.

#### Results:

Few studies (n= 11) were found that investigate mindfulness in at-risk adolescents. These studies used various mindfulness programs (n = 7) making it difficult to generalize findings for practice. Only three studies were randomized control trials focusing mostly on male students with low socioeconomic status and existing mental health diagnoses.

#### Conclusion:

There is a relationship between health behaviors and academic achievement. Future research studies on mindfulness based interventions need to expand to its effects on academic achievement in those youth at-risk to decrease problematic behaviors and improve their ability to be successful adults.

**Keywords:** Age 10-19, academic achievement, at-risk adolescents, interventions, mindfulness based programs, review.

## INTRODUCTION

There is a direct relationship between at-risk health behaviors and levels of academic achievement [1]. A broad definition of at-risk adolescents is those “young people who are at-risk of not maturing into responsible adults“ [2 p. 4]. Specific behaviors (e.g. carrying weapons, delinquency, substance use in themselves and/or their families, current sexually activity, unintended pregnancy, dropping out of school, watching television three or more hours on school days and limited physical activity) place some adolescents at-risk for poor academic achievement [2, 3]. Even if these behaviors are not initiated, there are social characteristics (e.g. low income/poverty, urban living) contributing to their vulnerability [2].

The World Health Organization [4] defines adolescence (ages 10 to 19) as a period of rapid physical and mental changes; when individuals gain critical new skills, navigate unique challenges and transition from primary to secondary education. Some children do not have sufficient family resources, parental support or social skills to be successful in

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transitioning into secondary education [5]. Adolescents may also experience violence and poverty adding to increased risky behaviors and less likelihood of being financially responsible adults.

Life course theory as discussed by Elder [6] explains that early transitions have lasting consequences on lives since they impact later transitions. The behavioral consequences can set into motion the idea of “cumulating advantages and disadvantages” [6], p.7. Rutter [7] described *turning points* as experiences that contribute to some environmental or biological “discontinuity” and those effects persist in a person’s life (p.613). These experiences can be intrinsic (such as puberty) or extrinsic (education attrition) in nature. Early sexual behaviors in adolescence can lead to pregnancy and/or sexually transmitted infections and low educational achievement contributing to lasting changes in their adult lives [6]. However these turning points do not necessarily mean they are negative life events; rather individuals respond differently to these turning points. This transition theory has been used in developmental psychology and psychopathology, but scarcely used to explain or predict academic performance at particular turning points in the lives of students [5]. According to Benner [8], transition theory can be applied to educational transitions. A transitional-focused lens is a helpful way to investigate challenging educational experiences.

Changes in early adolescence mandate using and nurturing existing skills and rapid learning and application of novel skills. The adolescent’s individual skills of emotional regulation and social and cognitive abilities are needed under conditions of educational and personal change [5]. Rew *et al.* [9] found alcohol consumption and riding with drivers who drank in 7<sup>th</sup> and 8<sup>th</sup> grade girls were related to experiencing stressful events. It is important to identify interventions for at-risk adolescents to decrease the detrimental behaviors developed during transitioning into secondary school. Mindfulness skills can give students empowering coping strategies to successfully navigate challenging educational transitions.

### **Mindfulness as an Intervention**

Jon Kabat-Zinn [10, 11] formulated Mindfulness Based Stress Reduction (MBSR) to teach clients an ancient and transforming practice that would be adjunct to their medical treatments. Mindfulness based practices are the foremost agent of change in MBSR. According to The Center for Mindfulness in Medicine, Health Care and Society Standards of Practice [12], mindfulness is “making each moment count” since it involves consciously being aware of the present [p.2]. They advocate it is not a therapeutic intervention, rather educational for individuals to practice for themselves. Skills such as yoga, meditation, mindful eating and body scan are incorporated into the MBSR program. The original MBSR manualized course is an 8-week program educating and encouraging adults to take an active role in their own well being.

Mindfulness training and practice has a broad scope of documented benefits that continue to expand as evidenced by recent studies. College students returning from active military service have credited mindfulness training to better emotional and physical coping, positive changes in personal functioning, increased organizational skills, and better stress management skills [13]. Mindfulness techniques and training can be used to successfully weaken the thought associations and cravings with substance use disorders [14]. Women have experienced long term benefits attributed to mindfulness meditation related to improvement in their irritable bowel syndrome symptoms [15].

Engaging in mindfulness increases awareness of thinking that contributes to emotional regulation; key for academic achievement [16]. High emotional distress in adolescence can lead to behavior problems and engagement in harmful risk taking behavior [17, 18]. In addition, this distress disrupts learning by lowering the adolescent’s self efficacy and motivation for academic achievement [19]. Mindfulness may assist at-risk adolescents during their educational transitions to improve their health outcomes. Delivering these interventions in a school setting may provide a convenient avenue for students to participate in mindfulness.

A recent review of adolescent mindfulness based programs in schools [20] found studies lacked details on their mindfulness programs and no age appropriate mindfulness process measurements. A systematic review and meta-analysis [21] on school based mindfulness interventions (primary and secondary schools combined) found a large effect size for cognitive performance with smaller effect sizes for resilience, stress and coping. While the previous review [20] and systematic review/meta-analysis [21] are valuable, they do not focus on at-risk adolescents. A mindfulness intervention can be utilized alone or with other stress relieving activities to encourage emotional regulation, minimize stress and foster skills to aid in paying attention in the at-risk adolescent populations [22]. The purpose of this review is to examine studies on mindfulness programs used in at-risk adolescents.

## METHOD

Existing information regarding mindfulness and adolescents at-risk for poor outcomes such as not graduating high school, unplanned pregnancies and sexually transmitted infections was gleaned through various methods of literature search. Adolescence was defined as 10-19 years of age [3]. The keywords used include *mindfulness*, *at-risk* and *adolescents* in each database to search CINAHL (10 items: 2 book reviews, 3 Dissertations, and 5 research articles), Medline EBSCO (15 research articles), and PubMed (10 research articles). Duplicate studies were removed from the considered studies. Only primary research articles with a publication date of 2009 to 2015 were considered to ensure information on mindfulness and at-risk adolescents was the most current available.

## RESULTS

Eleven studies addressed mindfulness based programs in at-risk adolescents. At-risk adolescents included teens with psychiatric disorders, low family incomes, urban living, HIV infection, poor academic achievement or incarceration. These 11 studies included eight different programs: *Mind Body Awareness*, *Taming the Adolescent Mind*, *MBSR-Teen*, *Learning 2 BREATHE*, a secular yoga intervention and three other adapted MBSR programs (See Table 1).

**Table 1. Studies on mindfulness with at- risk adolescents.**

Citation	Design/Country	Sample	Intervention	Data Collection	Results
Barnert <i>et al.</i> , (2014)	Mixed methods US-California	N =29 incarcerated male adolescents	MBA curriculum for At-risk youth 1 day retreat	Focus group MAAS TCS HSR PSS	Sig—Self regulation Qualitative: enhanced well being, self discipline, social cohesiveness, awareness, some resistance to meditation
Biegel <i>et al.</i> (2009)	RCT US	N= 102 14-18 yr. psychiatric disorders	8 week MBSR-T	SES SCL-90R PSS	Sig- more self-esteem, less anxiety, perceived stress, somatic, obsessive compulsive, interpersonal sensitivity, depressive symptoms
Edwards <i>et al.</i> (2014)	Quasi Experimental US-Southwest	8 Male/12 Female Latino middle school students	8 week MBSR-T	MAAS, SCS, PSS, SCL-90R	Increase mindfulness, self-compassion, less stress & psychological distress. NS- anxiety symptoms
Gould <i>et al.</i> (2012)	Pilot RCT US	N = 97 4 <sup>th</sup> & 5 <sup>th</sup> grade urban disadvantaged youth	12 week secular yoga-inspired intervention	Short Mood and Feelings Questionnaire-Child Emotion Profile Inventory Reponses to Stress Involuntary Engagement Scale	NS- emotional-regulatory for gender or grade Sig-Impulsive action, Involuntary engagement stress; higher depressive symptoms most improvement
Himmelstein <i>et al.</i> , (2012)	Qualitative US-California	N = 23 incarcerated male adolescents	10 week MBA	Semi structured interviews	Increased subjective well being, self regulation, self awareness, positive group experience and accepting attitude toward treatment
Lau & Hue (2011)	Pilot Control Trial Hong Kong	N = 48 low academic performance ages 14-16 yr.	6 week modified MBSR	MAAS FMI SPWB DASS PSS	Decreased depression, improved personal growth, wellbeing NS-stress, mindfulness
Sibinga <i>et al.</i> (2011)	Single group pretest posttest US	N = 26 13-21 y.o. HIV + and at-risk urban youth	9 week modified MBSR	CHIP-AE SCL-90R	Sig reductions hostility general & emotional discomfort
Sibinga <i>et al.</i> (2013)	RCT US-Maryland	N = 41 41 7 <sup>th</sup> & 8 <sup>th</sup> grader urban males from low income—95% AA	12 sessions school based MBSR vs control of 12 sessions health education	SCL-90R Camm COPE Inventory Sleep diaries, Actiwatch Salivary cortisol levels	NS- sleep MBSR less anxiety, rumination than HT Increased cortisol levels during academic terms for HT remained constant for MBSR
Rawlett (2014)	RCT US-Maryland	N=23 Ages 11-13 yr. females at-risk for not graduating HS	6 weekly sessions school based using L2B Mindfulness curriculum	RSQ PANAS-C (10 item) MAAS	NS-differences in coping, Mindfulness was greater after the interventions

(Table 1) contd....

Citation	Design/Country	Sample	Intervention	Data Collection	Results
Tan & Martin (2013)	Single group longitudinal design Australia	N =10 adolescents with psychiatric disorders	5 week <i>Taming the Adolescent Mind</i>	DASS-21 SES CAMP AFQ-Y8 short version	Sig. decrease in psychological distress; increase in mindfulness & self-esteem.
Tan & Martin (2015)	RCT Australia	N = 80 13-18 yr with mental disorders	5 week <i>Taming the Adolescent Mind vs</i> TAU	SES DASS-21 AFQ-Y8 short version CAMP CBCL RSCA	Higher mindfulness, self-esteem, improved psychological inflexibility, decreased mental distress No change in resiliency

**MBA**- Mind Body Awareness; **MBSR**- Mindfulness Based Stress Reduction; **TAU**-Treatment as usual; **CAMP** - Children's Acceptance and Mindfulness Measure-short version (Greco, Smith & Baer, 2011); **DASS-21**- Depression Anxiety Stress Scale - short version (Lovibond & Lovibond, 1995); **CBCL**- The Child Behaviour Checklist (Achenbach, 1999); **RSCA**- Resiliency Scales for Children and Adolescents (Prince-Embury, 2006); **AFQ-Y8**- Avoidance and Fusion Questionnaire for Youth (Greco, Lambert, & Baer, 2008); **HSR**-Healthy Self-regulation scale (West, 2008); **TCS**-Teen Conflict Survey, impulsiveness subscale (Bosworth and Espelage, 1995); **SES**-Rosenberg Self Esteem scale (1989); **SCL-90R**: Hopkins Symptom Checklist 90 Revised (Derogates, 1977); **MBSR-T** -Mindfulness-Based Stress Reduction for Teens; **SCS**-Self Compassion Scale; **MAAS**-Mindful Attention Awareness Scale (Brown & Ryan, 2003); **CHIP-AE**- Child Health and Illness Profile-Adolescent Edition; **RSQ**-Response to Stress Questionnaire-Child Self-report on Peer Stress (Connor-Smith *et al.*, 2000); **PANAS-C (10 item)**-Positive and Negative Affect Scale (10 item) for Children (Ebesutani *et al.*, 2012).

### Mind Body Awareness

Himmelstein *et al.* [23] investigated the experience of a 10-week mindfulness intervention called Mind Body Awareness ([www.mbaproject.org](http://www.mbaproject.org)) for incarcerated male adolescents ( $n = 23$  range age 14-18 years). The participants were mixed in race and ethnicity (14 Latino, 4 African American, 3 Caucasian-American and 2 Pacific Islander). This curriculum includes formal and informal mindfulness meditation training emotional intelligence experiences, group process and specific discussion topics (*e.g.* forgiveness, changing negative core beliefs). Classes occurred once a week and shortened to 60 minutes from the original 90 minutes to accommodate the institution. Semi structured interviews evaluated their experience, learning and practicing meditation, discussion topics and helpfulness of the curriculum. Thematic analysis revealed six themes: increases in subjective wellbeing, self regulation, self awareness, positive group experiences and accepting attitude toward the treatment. They found the curriculum to be feasible in delivering in this population and mentioned they received no negative comments about the program. However due to the setting of the program, these findings may not adequately represent their experiences.

Barnert *et al.* [24] later examined a one day retreat in incarcerated male youth in the same correctional system as Himmelstein *et al.* [23]. This seven hour retreat included a synthesis of a 10 week Mind Body Awareness program which all participants completed before the retreat. They examined mindfulness, self regulation, impulsiveness, and stress, conducted a focus group with 12 participants on their experiences and extracted youth behavior points (scored weekly-low negative to high positive) from their probation files. Results showed only significant changes in self regulation. Qualitative analysis revealed enhanced well being, self awareness, self discipline, social cohesiveness, and some resistance to meditation. Even though their program has been developed specifically for at-risk youth, it may entail adaptations depending on the risk behaviors of the group.

### Taming the Adolescent Mind

Tan and Martin [25] examined the MBSR modification and development of a 5 week mindfulness based intervention group program named *Taming the Adolescent Mind* for teenagers (age range 13-17 years) with psychiatric disorders ( $n=10$ ; 70% female, all Caucasian). The components of the intervention were ROAM: R: regulate attention, O: observe inside, A: acceptance without judgment, and M: be mindful. The curriculum includes two formal mindfulness exercises, reviews of homework practice, and group discussions at each session. The outcomes include mindfulness, self-esteem and psychological distress. Participants were recruited from a mental health outpatient treatment setting and completed measures at baseline and 3 months after completed intervention. After the MBSR intervention, adolescents reported significantly lower psychological distress from baseline and increases in mindfulness and self-esteem. Eighty nine percent of the participants continued some mindfulness at home at 3-month follow up. Qualitative data provided feedback from participants that the intervention was engaging and beneficial and may lead to use of the techniques beyond the formal curriculum.

Tan and Martin [25] conducted a larger randomized control trial with 80 adolescents who have psychiatric disorders using the *Taming the Adolescent Mind* curriculum *versus* treatment as usual (*e.g.* group therapy, cognitive behavioral therapy, medications, family therapy). These adolescents were predominately female (75%) and 69% of all participants

were not on medications. They measured mindfulness, self-esteem, psychological inflexibility, mental distress and resiliency. They found significantly higher mindfulness, mental health, self-esteem and lower psychological inflexibility in the intervention group than the treatment as usual group. Resiliency was not significant between the two groups. This was the first RCT completed with an age appropriate mindfulness curriculum showing some effects on mental health.

### **Mindfulness Based Stress Reduction-Teen**

Biegel, Brown, Shapiro and Schubert [26] conducted a randomized control trial with 102 adolescents age 14-18 years ( $M = 15.4$  years) from a psychiatric facility. They created a manualized curriculum based closely to adult MBSR. At-home mindfulness practices were reduced from 45 minutes to 20-35 minutes in length, there was no day long retreat and discussion topics on stress and behavior focused on issues among adolescents (*e.g.* self image, life transitions, self harming behavior, and communication/relationship difficulties). Participants were over 70% female and 73% were Caucasian or Latino. Results showed improved anxiety, perceived stress, self-esteem, and less somatic, obsessive compulsive, interpersonal sensitivity and depressive symptoms in the intervention group *versus* treatment as usual group (psychotherapy and or psychotropic medications).

Edwards *et al.* [27] tested the impact of Biegel's curriculum manual "Mindfulness Based Stress Reduction for Teens" (MBSR-T). They examined this 8 week session mindfulness structured curriculum for the outcomes of perceived stress, mindfulness, self compassion and psychological symptoms. Latino middle school students (8 male and 12 female, ages 12-17 years) were recruited through School Based Health Centers and an after school program in a rural area. Seven different eight-session cohorts were conducted over the course of 15 months. Data points were collected 2 weeks before the intervention, immediately before the first session and at the end of the eight session groups. The intervention consisted of one session weekly for 8 weeks, each lasting 50 minutes. The five group facilitators were all professionals with either psychology or counseling backgrounds. Two facilitators were Latino and three facilitators were Caucasian. In addition, Gina Biegel acted as a telephone consultant for feedback and ideas. Results suggest there were increases in mindfulness, self compassion, and lower stress and psychological distress. There was no change in anxiety symptoms.

### **Learning 2 BREATHE**

Learning 2 BREATHE (L2B) [28] is a mindfulness based curriculum for youth written for school or community settings, led by trained L2B instructors. The curriculum is meant to strengthen emotion regulation and attention, improve adolescents' stress management and help youth benefit from mindfulness every day. Each lesson includes age-appropriate discussions, activities and opportunities to practice mindfulness skills in a group setting. The goals of the program are for students to understand their thoughts and feelings, learn how to use mindfulness skills for emotional responses and guided group practice. The six sessions are 45 minutes in length.

The letters of the word BREATHE represent the first letters of the components of the Mindfulness Curriculum (MC) Intervention Group. The MC intervention includes meeting with participants as a group to guide students in Body Awareness, Reflection, Emotional Awareness and Regulation, Fostering Attention, Practicing Tenderness and Awareness of Habits. Interventions include classroom activities around mindful eating, listening and movement and small group discussion about feelings and emotions including pleasant and unpleasant events [28]. Adolescents can use workbooks and journals to record their daily activities.

Metz *et al.* [29] conducted a quasi-experimental trial using the L2B program in a public high school setting ( $n = 216$ ) to examine perceived stress, psychosomatic complaints (*e.g.* headaches, fatigue, worry), impulse control, and emotional regulation skills. Students in a choir class were eligible for the study (their teacher was a trained L2B instructor). Sessions were delivered in the first 25 minutes of class and given over 16 weeks to accommodate the class schedule. The control group was instruction as usual. They found significantly lower perceived stress and psychosomatic complaints and higher efficacy in affective regulation and emotion regulation skills. There was no difference in impulse control. This study used two public high schools with a high graduation rate (99%), middle to high-income families, and 99% Caucasian student body. It is encouraging of the feasibility of the project, but difficult to apply these results for at-risk populations.

L2B was used in a recent pilot RCT study [30] with 6<sup>th</sup> grade female students ( $n = 22$ ) from a public boarding school for at-risk youth in the Mid Atlantic area of the U.S. Students were randomized by dormitory to participate in the L2B group or an attentional comparison group weekly for 6 weeks. An investigator trained in mindfulness techniques and curriculum led L2B sessions. Among variables such as coping, affect and mindfulness, the study examined feasibility

for using L2B in this at-risk population. (Results on quantitative variables are pending publication). Challenges of using L2B in this school based setting with young adolescent females included effectively addressing disruptive behavior of participants, finding appropriate space on the school's campus for the class and self-practice sessions, working through a culture of mistrust of outsiders and working with individuals who may not see initial value in mindfulness techniques. Benefits of providing an intervention on-campus include having a captive audience for sessions as students do not have to travel to attend mindfulness classes. The environment was safe and known to both participants and their parents and students can easily be followed up long term if they remain enrolled in the school. The study found the program to be feasible in this school based setting with at-risk girls.

### Various Modified MBSR Programs

Sibinga *et al.* [31] examined general acceptability, psychological symptoms and quality of life in HIV infected and at-risk urban youth ( $n = 26$  completers, Mean age = 16.8 years). A MBSR program was conducted in a pediatric primary care clinic associated with an urban tertiary care hospital. They made adaptations to their program by simplifying language and assisting with the logistics of transportation and class schedules. All adolescents were African American, 77% were female and 11 were infected with HIV. Results showed significant reduction in hostility, general and emotional discomfort. The ten adolescents who completed in-depth interviews perceived improvements in interpersonal interactions, school achievement, physical health and decreased stress. Despite best efforts for improving logistics, feasibility of completing the sessions still included transportation issues, after school sports, and employment responsibilities.

Sibinga *et al.* [32] completed a randomized control trial using their previously adapted MBSR program with low-income 7<sup>th</sup> and 8<sup>th</sup> grade boys ( $n=44$ , range age 11-14 years; 95% African American) in a school-based setting. The program was 12 weeks in duration and sessions lasted 50 minutes each during the school day. Data were collected at three points: baseline, post-program (within two weeks of the program completion) and at 3 months. Outcomes included psychological functioning, coping and mindfulness, sleep onset and latency, and salivary cortisol levels. There were a high number of students lost for the 3 month data point and those data were not reported in the article. MBSR students had less anxiety, less rumination and less negative coping. Within the MBSR group, mindfulness was associated with decreased self-reported angry temperament and less anger reactivity. Generally, cortisol output was higher after the program for both groups. The various measures of sleep showed no differences between the two intervention groups. Implementation of the MBSR program into the school setting was more feasible than their previous attempt at the primary care clinic.

Lau and Hue [33] delivered a modified 6 week MBSR in Hong Kong for low academic achieving 14 to 16 year old students ( $n = 48$ ) to assess well-being, stress reduction, and depressive symptoms. The program included gentle stretching exercises, awareness of body sensations, body scans and loving-kindness practice administered in the schools. Results found decreased depressive symptoms, increased personal growth and well-being in the intervention group, but no difference in stress or mindfulness. Qualitative data support the feasibility and benefits of the intervention.

### Secular Yoga Inspired Program

Gould, Dariotis, Mendelson and Greenberg [34] detailed a mindfulness intervention used for 4<sup>th</sup> and 5<sup>th</sup> grade urban youth ( $n=97$ ; 60% female; mean age= 10.6 years) looking at moderators of intervention effects before and after a 12 week mindfulness intervention. Four urban, public elementary schools were paired by level of disadvantage (lower test scores and large amount of students receiving free lunches) and randomized within each pair to intervention or control group. The children were randomly assigned to either the mindfulness intervention or a 'wait-list' control group. The intervention group participated in a yoga inspired mindfulness group 4 days a week each 45 minutes in length during school hours. Along with yoga, instructors taught breathing techniques, paying attention to each breath and sending out positive energy. The outcomes included depressive symptoms, positive and negative emotions, and stress responses at baseline and 2 weeks after completed intervention. Eighty two students self identified as African American, four as Latino, four as White and seven as "mixed race". No significant interactions were found with emotional-regulatory impacts, gender or grade. The mindfulness intervention group reduced involuntary engagement stress in both genders. Students who reported the highest levels of depressive results demonstrated the biggest improvements in post intervention depressive measures. The intervention used a previously developed yoga program with minimal details on each session.

## DISCUSSION

Interventions to improve mindfulness in at-risk youth have been varied among groups and curricula. Studies have been designed for teenagers with diagnosed psychiatric disorders (such as anxiety, depression and bipolar), incarcerated youth, HIV positive adolescents, ethnic minorities and urban dwelling male teens. These mindfulness interventions ranged in duration from as little as 5 weeks to 12 weeks. Results suggest mindfulness interventions can lower stress, hostility, and general/ emotional discomfort, while increasing mindfulness, self-esteem and perception of interpersonal relationships, physical health and health self-regulation. One study [31] obtained qualitative perception of improved school achievement and two studies [33, 34] identified at risk adolescents by low academic achievement and test scores, but did not measure improvement in academics after the interventions. The various types of mindfulness programs make it difficult to generalize to other adolescents. Mindfulness in adolescents is of global interest with studies conducted in Hong Kong, the United States, Holland, Canada and other countries. The most common settings for mindfulness-based interventions with youth are school and clinic based group settings.

The articles contained in this review lend valuable information to health care providers and researchers. Mindfulness practices can be expanded to various adolescent groups. Middle and high school students that are challenged academically may be able to use mindfulness to increase concentration and improve study skills. Youth with existing mental health diagnoses such as depression, anxiety and suicidal ideation may be able to use mindfulness techniques as part of a comprehensive health plan guided by a qualified professional to minimize symptoms and improve outcomes.

## CONCLUSION

Mindfulness can be a part of reducing risky behaviors, improving mental health and assisting at-risk youth with transitions. Studies are examining other outcomes besides emotional regulation, in school mindfulness-based programs such as diet and physical exercise [35] and poor sleep habits [36] for adolescents. Expanding the opportunity for mindfulness practice time in school or similar settings may alleviate the inconvenience of attending sessions outside school time. Successful implementation of school-based mindfulness programs require highly trained mindfulness teachers and evidence supported mindfulness curricula [37]. Mindfulness teaching is a potentially powerful tool that can benefit adolescents and their families and future research needs to focus on its impact on academic achievement from learning these emotional regulation skills.

## CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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