Effectiveness of StressOFF Strategies: A single-session school-based stress management program for adolescents

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Abstract

Stress in adolescents is increasing (APA, 2014), and there is a need for adolescent-targeted programs to promote adaptive coping through the teaching of effective coping skills (Foret et al., 2012; Frydenberg & Lewis, 2000). Schools have been proposed as an appropriate site to implement such programs; however, existing programs are lengthy and require additional time and resources (Fridrici & Lohaus, 2009). The present study evaluates StressOFF Strategies (StressOFF; Shapiro & Heath, 2013), a single-session (45 min) adolescent-targeted, school-based stress management program that introduces cognitive behavioral and mindfulness based techniques. Participants were 227 Grade 9–11 students from 27 classes in seven secondary schools. Classes were randomly assigned to the treatment group (n = 89; 58% male, 42% female) or to an active control group (n = 138; 44% male, 57% female), which received a study skills based stress management program (Be PREPARED; Shapiro & Heath, 2015). At pre-program, participants completed a questionnaire of prior experiences with stress management as well as measures of perceived stress, test anxiety, and mindfulness. At immediate post-program, participants completed a program response questionnaire, which evaluated students' perceptions of amount learned, level of difficulty of program, overall program rating, recommendation to a friend, and understanding of strategies and willingness to use them. At one-month follow-up, the program response questionnaire was completed again along with measures of perceived stress, test anxiety, and mindfulness. Pre-program, participants in both conditions reported comparable findings of limited knowledge of stress and stress management, moderate interest in learning about stress and stress management, and they reported regular use of stress management strategies, such as distraction. One month following participation in the programs, students in the StressOFF and Be PREPARED groups reported decreased perceived stress, increased

mindfulness, and decreased test anxiety levels. Although both StressOFF and Be PREPARED were found to be effective at improving mental health outcomes over time, students reported learning more from StressOFF and rated the program more favorably. Students provided comparable reports of program difficulty and recommendation to a friend for both StressOFF and Be PREPARED. Over time, however, in both groups, students' ratings of amount learned, level of difficulty of program, program evaluation, and friend recommendation all decreased. Immediately following the program, students in StressOFF and Be PREPARED reported high levels of understanding and moderate to high willingness to use strategies. However, like their program response, in both groups, students' understanding and willingness to use strategies generally decreased over time. Only their reports of willingness to use the Prioritize, Reading, and A good study space strategies from the Be PREPARED program were sustained at one-month follow-up. Comparable effectiveness of StressOFF and Be PREPARED suggests that a single-session stress management program can improve students' mental health outcomes over time. Specifically, students may benefit most from the components of psychoeducation and stigma reduction shared by both programs; however, there is indication that students prefer StressOFF and report learning more than students who participated in the Be PREPARED program. Interestingly, despite self-reported benefits in stress, test anxiety, and mindfulness over a one-month follow-up period, students in both groups reported decreased ratings of program and strategies over that time, suggesting a possible need for ongoing strategy and program reinforcement. Findings from the current dissertation provide encouraging support for the implementation of a single-session stress management program in the schools; although, to ensure maintenance of strategy use, ongoing follow-up is recommended.

Résumé

Étant donné le niveau de stress croissant chez les adolescents (APA, 2014), des programmes qui visent les adolescents sont nécessaires afin de promouvoir l'adaptation à travers l'apprentissage de stratégies d'adaptation efficaces (Foret et al., 2012; Frydenberg & Lewis, 2000). Les écoles ont été proposées comme un site d'program approprié pour ce genre de programmes; par contre, les programmes existants sont de longue durée et nécessites du temps additionnel ainsi que des ressources (Fridrici & Lohaus, 2009). Cette étude évalue StressOFF Strategies (StressOFF; Shapiro & Heath, 2013), un programme pour adolescents d'une session (45 min) en milieu scolaire, qui vise à faciliter la gestion de stress en introduisant des techniques cognitivo-comportementales et basées sur la pleine conscience. Les participants étaient 227 étudiants de secondaire 2-4 de 27 classes dans sept écoles secondaires. Les classes étaient assignées de façon aléatoires soit au groupe de traitement (n = 89; 58% garçons, 42% filles) ou à un groupe de contrôle actif (n = 138; 44% garçons, 57% filles), qui recevaient un programme de gestion de stress axé sur les compétences (Be PREPARED; Shapiro & Heath, 2015). Avant l'program, les participants ont complété un questionnaire évaluant leur expérience antérieure en gestion de stress ainsi que des questionnaires sur leur niveau de stress ressenti, d'anxiété due aux examens, et de pleine conscience. Immédiatement suite à l'program, les participants ont complété un questionnaire évaluant leur réaction aux programmes, qui mesurait le niveau d'apprentissage perçus par les étudiants, le niveau de difficulté du programme, une évaluation générale du programme, la recommandation aux amis, ainsi que la compréhension des stratégies et la volonté des étudiants d'employer ces stratégies. Un mois suite à l'program, les questionnaires évaluant la réaction des étudiants aux programmes, et leur niveau de stress ressenti, d'anxiété due aux examens, et de pleine conscience ont été complétés une fois de plus. Pré-program, les

participants des deux conditions reportaient des résultats comparables: peu de connaissances du stress ou de la gestion du stress, un intérêt modéré d'en apprendre plus sur le stress ou la gestion du stress, et une utilisation régulière de stratégies de gestion de stress tel que la distraction. Un mois suite à l'program, les étudiants dans les groupes StressOFF et Be PREPARED reportaient moins de stress ressenti et d'anxiété due aux examens, ainsi qu'une augmentation de pleine conscience. Malgré que StressOFF et Be PREPARED étaient comparablement efficaces en améliorant la santé mentale, les étudiants reportaient apprendre plus de StressOFF et donnaient une meilleure évaluation du programme. Les étudiants reportaient aussi que StressOFF et BePREPARED étaient comparables en termes de difficulté de programme et qu'ils les recommanderaient comparablement à leurs amis. Par contre, avec le temps, les étudiants dans les deux groupes reportaient une diminution d'apprentissage, de difficulté des programmes, d'évaluation de programme, et de recommandation aux amis. Immédiatement suite aux programmes, les étudiants dans StressOFF et BePREPARED reportaient de plus hauts niveaux de compréhension et des niveaux modérés à élevés de volonté à utiliser ces stratégies. Par contre, tout comme leur réaction aux programmes, la compréhension et volonté à utiliser les stratégies ont diminué avec le temps. Seul leur volonté d'utiliser les stratégies « Prioritize », « Reading », et « A good study space » du programme BePREPARED était soutenue après une période d'un mois. L'efficacité comparable de StressOFF et BePREPARED suggère qu'un programme de gestion de stress d'une session peut améliorer la santé mentale sur une période de temps. Spécifiquement, les étudiants peuvent bénéficier particulièrement des aspects de psychoéducation et de réduction de stigma qui étaient présents dans les deux programmes; par contre, il y a une indication que les étudiants préféraient StressOFF et reportaient un meilleur apprentissage que les étudiants participant dans le programme Be PREPARED. Étonnamment,

malgré les bienfaits signalés par les étudiants en termes de stress ressenti, d'anxiété due aux examens, et de pleine conscience au cours d'une période d'un mois, les étudiants dans les deux groupes reportaient une diminution d'évaluation de programme et de stratégies au cours de cette période, ce qui suggère la possibilité d'avoir un renforcement continu de stratégies et de programme. Les résultats de cette dissertation offrent un appui encourageant pour l'implémentation d'un programme de gestion de stress d'une session dans le milieu scolaire; par contre, afin d'assurer le maintien d'utilisation de stratégies, un soutien continu pour les étudiants est recommandé.

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I would like to dedicate this project in memory of Thelma Fraiberg Shapiro ז״ל* who we lost suddenly in November 2016. Thelma had great interest and firmly believed in the merits of the StressOFF program (she even helped design the StressOFF logo!) She inspired me to never give up no matter how difficult the circumstance and persist in my quest to help others, in whatever capacity that entails.

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* Refers to the Hebrew abbreviation of, "of blessed memory."

Preface

I, Amy J. Shapiro, am the primary author of this dissertation, and I have written the dissertation in its entirety; however, this project incorporates some material that is the result of collaborative work. My doctoral supervisor, Dr. Nancy Heath played an integral role in the supervision of this project at every stage, as well as in the creation of the StressOFF and Be PREPARED programs. My co-supervisor, Dr. Victoria Talwar, as well as committee members, Dr. Elana Bloom and Dr. Tara Flanagan, were central to the development of the preliminary stages of this project, and provided essential feedback and direction at the final stages of the manuscript. Jessica Mettler translated the abstract to French, and Jennifer Lavoie assisted with APA formatting. This dissertation contains original scholarship and provides a unique contribution to school-based stress management program research. It is the first study to demonstrate that a single-session stress management program has the potential to be effective in reducing perceived stress, test anxiety, and increasing mindfulness, even one month after the program. The study was approved by the McGill Research Ethics Board at McGill University and by two school boards in Quebec, whose names will be withheld to ensure confidentiality.

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Introduction

Adolescence is a period during which numerous changes occur, including those of a biological, social, and psychological nature (Hankin, Mermelstein, & Roesch, 2007). These changes may precipitate stress, yet the ability to effectively manage and adapt to them is integral to healthy adolescent development (Washington, 2009). Adolescent stressors typically fall under two categories: normative and non-normative. Normative stressors include daily and developmental stressors, such as puberty, school transition, and increased academic demands whereas non-normative stressors comprise stressors that arise out of unusual circumstances, such as serious illness, divorce, and abuse (Lau, 2002; McNamara, 2000; Suldo, Shaunessy, & Hardesty, 2008). The most common stressors among adolescents include school, home and family life, and social disadvantages (American Psychological Association, 2009; 2014; LaRue & Herrman, 2008).

School Stressors

School stress is often cited as the most frequent worry among adolescents (e.g., Brown, Teufal, Birch, & Kancherla, 2006; LaRue & Herrman, 2008). According to Lau (2002), the three main categories of school-related stressors are fear of failure, test anxiety, and stressors related to the school setting.

The pressures associated with the curriculum often pose a great source of stress for some students, who may find that they have difficulty keeping up (Lau, 2002). Furthermore, on top of their own worries about failure, many adolescents feel as if they must rise to the expectations of their parents, which can induce further fear of disappointment and failure. Many parents want their children to participate in many activities for them to become "well-rounded and accomplished" (Washington, 2009, p. 304). Without these opportunities, some parents fear that

their child will fall behind.

The fear of failure is often followed by the fear of examinations, or test anxiety (Lau, 2002). Test anxiety, which is experienced by 22% to over a third of high school students (Methia, 2004), is broadly viewed as a situation-specific trait comprising cognitive, physiological, and behavioral responses that accompany evaluative situations (Lowe, 2016; Spielberger & Vagg, 1995; Zeidner, 1998). At various stages of test taking (e.g., before, during, after), individuals with test anxiety experience debilitating levels of distress, including physiological tension, self-doubt, and preoccupation with consequences of poor performance (Lowe et al., 2008; Sarason, 1978; Sarason & Sarason, 1990; Zeidner, 1998). During test taking, such individuals may be so overcome with anxiety that they report "freezing" or having difficulty recalling important information; they may also have trouble concentrating, or they may struggle with interpreting straightforward instructions (Lowe et al., 2008; Sarason, 1978; Zeidner, 1998).

Other stressors related to the school setting are often due pervasive problems, such as violence, bullying, theft, and drugs, which can also be a source of stress for adolescents (Lau, 2002). Furthermore, the student-teacher relationship may also result in stress for some adolescents when there is conflict or a perceived lack of respect, impacting success in school and overall stress levels (Chandra & Batada, 2006; LaRue & Herrman, 2008).

Home and Family Life

In addition to school, family and home life is often cited as a major stressor in adolescents' lives (LaRue & Herrman, 2008). In Chandra and Batada's (2006) study, adolescents reported family conflict around regular household activities, such as homework, cleaning their rooms, and doing chores. Other common sources of stress reported included

worrying about the well-being of family members and experiencing conflict with siblings (Chandra & Batada, 2006). Adolescents might also face stressors within the family caused by specific events, such as death, divorce, and physical or psychological abuse (Lau, 2002). The death of a close family member, especially one that is unexpected, can take a devastating toll on the child's mental health (Keyes et al., 2014). Children who are exposed to divorce may also face increased stress stemming from the lowering of a family's standard of living or changing of living arrangements (Lau, 2002). Another potential significant stressor is the presence of physical or psychological abuse in the home, which is linked to an array of negative outcomes related to education, and mental and physical health (Gilbert et al., 2009).

Social Disadvantages

As is the case with school and home and family life, social disadvantage poses a great stress for adolescents. Social disadvantage may be related to race, community, ethnicity, or socioeconomic status (SES) and is linked to various potential stressors including violence, drug use, and poor housing (LaRue & Herrman, 2008; Miller, Webster, & MacIntosh, 2002). Many children who grow up in low-income families suffer poorer physical health and experience more stress than children who grow up in middle-class families (LaRue & Herrman, 2008; Lau, 2002). These children may also suffer from behavioral and emotional problems and are more likely to drop out of school or end up in correctional facilities (Lau, 2002).

Preventive programs

Adolescent stress is a risk factor for mental illness, such as anxiety disorders (Byrne, Davenport, & Mazanov, 2007; Rudolph, 2002), depression (Auerbach, Bigda-Peyton, Eberhart, Webb, & Ho, 2011; Waaktaar, Borge Helmen, Fundinsgrud, Christie, & Torgersen, 2004), and substance abuse (King & Chassin, 2008). According to the Canadian Mental Health Association

(2016), it is estimated that 10 to 20% of Canadian youth will develop a mental illness in their lifetime. There is also a known link between mental illness and suicide, with suicide accounting for 24% of all deaths among Canadian youth and young adults aged 15 to 24 (Canadian Mental Health Association, 2016).

These figures urgently call upon the implementation of effective preventive programs to buffer the effects of stress on the development of mental illness. The school is one environment in which many youth can be reached simultaneously. In the school setting, access to support is maximized and common barriers to treatment, such as cost and transportation, are reduced (Lock & Barrett, 2003). Accordingly, stress management programs have been evaluated at the school level (e.g., Broderick & Metz, 2009; Frydenberg et al., 2004; Sibinga et al., 2016). These evidence-based programs typically consist of six to 12 weekly sessions of 40 to 50 minutes; however, school personnel face significant time constraints and intense pressures to adhere to the curriculum, often making such programs difficult to implement (Bishop, Bryant, Giles, Hansen, & Dusenbury, 2006; Dusenbury, Brannigan, Falco, & Hansen, 2003; Fridrici & Lohaus, 2009). To increase feasibility, the development and implementation of brief preventive programs, such as single-session programs, has been proposed (Schmidt et al., 2007). Single-session programs have been found to be effective in school-based settings for alcohol and drug prevention (e.g., Dempster, Newell, Cowan, & Marley, 2006), and for reducing stigma around mental illness (e.g., Ke et al., 2015).

Rationale for the Development of StressOFF

Given the constraints of the school environment and the merits of single-session school-based programs, Shapiro and Heath (2013) developed StressOFF Strategies (StressOFF), a single-session, universal school-based stress management program that provides

psychoeducation, incorporates video-based peer talks and celebrity examples as a means of stigma reduction, and teaches coping strategies based in cognitive behavioral therapy (CBT) and mindfulness. Since CBT is among the most studied evidence-based practices (Creed, Waltman, Frankel, & Williston, 2016) and mindfulness is expanding in interest and in use in educational settings to support students' mental health and overall wellbeing (Roeser, 2014), StressOFF integrates strategies from both approaches. The program, which is manual-based and delivered to students by a trained facilitator, consists of a 45-minute PowerPoint presentation including animations, videos, and stress management strategy practice. The development of program content was guided by a review of evidence-based stress management programs and consists of four key components: (a) stigma reduction, (b) psychoeducation, (c) coping strategies (CBT and mindfulness based), and (d) follow-up (pamphlet and online resources).

A pilot evaluation of the StressOFF program with 565 Grade 9 students found that participants understood and were willing to use the strategies demonstrated, with almost 90% of students rating the program as good to excellent (Shapiro, Heath, & Carsley, 2016). The pilot evaluation presents a first step in evaluating the acceptability and perceived usefulness of StressOFF in the schools and suggests that the single-session stress management program is acceptable and perceived to be useful by students. The aim of the present research is to evaluate the effectiveness of StressOFF by comparing the program to a comparison group. To ensure that all students received support, an active control program was created for the comparison group: Be PREPARED (Shapiro & Heath, 2015), a study skills based stress management program. The development of the active control program was based on the following rationale: Academic stress is frequently reported as a significant stressor among adolescents (Brown et al., 2006; LaRue & Herman, 2008); students worry about their grades, their performance on tests, and they

often experience fear of failure (Lau, 2002). These stressors can be the result of ineffective study skills (Gettinger & Seibert, 2002), which has led to the implementation and evaluation of study skills based programs in the school setting (e.g., Langberg, Epstein, Urbanowicz, Simon, & Graham, 2008). Be PREPARED was designed to help students reduce their stress by providing them with effective study skills instruction. Like StressOFF, Be PREPARED also includes components such as stigma reduction, psychoeducation, and follow-up; however, instead of CBT and mindfulness based coping strategies, Be PREPARED introduces strategies that are study skills based.

The present dissertation will evaluate program effectiveness by measuring changes in students' perceived stress, mindfulness, and test anxiety levels from pre-program to one-month follow-up. The dissertation will also report on students' prior experiences with stress management (e.g., knowledge and use of stress management pre-program) and students' response to program (e.g., amount learned, program satisfaction, understanding and willingness to use taught strategies) immediately post-program and at one-month follow-up.

Chapter 1. Review of Literature

In their widely accepted transactional model of stress, Lazarus and Folkman (1984) define stress as involving "… a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 19). When a person's perceived stress level is greater than what he or she can cope with, acute symptoms, which fall into three general categories develop: cognitive (e.g., difficulty concentrating, academic difficulties), physiological (e.g., somatic complaints), and behavioral (e.g., mood swings, changes in sleep patterns; Brown et al., 2006; Washington, 2009).

There are three models of stress as indicated in the literature: medical, environmental, and psychological. According to the medical model in psychology, which was coined by Laing (1971) and emphasizes the physiological basis of psychological processes, stress is a physiological state of distress characterized by an increased heart rate, a rise in blood pressure, and the presence of arousal-producing hormones and neurotransmitters, such as cortisol, adrenaline, and norepinephrine (Selye, 1993; Suldo et al., 2008). The physiological stress response is adaptive in nature; it allows individuals to effectively respond to stressors both internally and in their environment. However, chronic activation of the stress-response system can have adverse effects on a person's physical health, leading to compromised immunity and an increased risk of developing illness (Rabin, 1999; Suldo et al., 2008). It can also impair the functions that are vital for effective learning (Arnsten, 1998; Metz et al., 2013).

Environmental models of stress conceptualize stress as an emotional, cognitive, or behavioral reaction in response to environmental stimuli, or a stressor that is external to the individual (Gatersleben & Griffin, 2017). It may consist of an imminent threat, or it may result from difficult conditions in a person's immediate environment (Suldo et al., 2008).

Psychological models conceptualize stress as the result of an imbalance between environmental demands and one's coping capabilities (Evans & Cohen, 2004). According to the psychological models, stress is the product of an interaction between an external stressor, the body's physiological response, and the person's response to the interaction, which can be cognitive, emotional, or behavioral (Suldo et al., 2008). Cognitive appraisal theory (Lazarus & Folkman, 1984), a transactional theory of stress, is central to the research on stress and coping. As per this theory, individuals engage in a coping process, which consists of two steps: cognitive appraisal process and coping response. In the cognitive appraisal process, the individual appraises the level of threat of the situation (primary appraisal) and then appraises his or her coping resources (secondary appraisal). The coping response, which is defined as "an intentional physical or mental action, initiated in response to a perceived stressor, which is directed toward external circumstances or an internal state (Folkman & Lazarus, 1980, p. 233) is then employed. Coping responses fall into two general categories: problem-focused coping and emotion-focused coping. The first refers to cognitive problem-solving and behavioral efforts to manage the source of the problem by altering the environment or by seeking resources to allay the threat of the situation. The second refers to cognitive and behavioral efforts to regulate emotional distress evoked by the problem. Cognitive restructuring, emotion regulation and employing selective attention are examples of strategies that can be employed to manage distress (Pincus & Friedman, 2004). Adaptive problem- and emotion-focused coping are indicative of better psychological adjustment (Hampel, Meier, & Kümmel, 2008), whereas poorer psychological adjustment is associated with maladaptive coping strategies, such as cognitive and behavioral avoidance, social withdrawal, uncontrolled release or ventilation of emotions, and self-criticism; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001).

Earlier research by Folkman and Lazarus (1980) suggests that an individual's coping style may vary according to the context of the stressful episode. Research demonstrates that youth employ different coping strategies depending on the demands of the stressful situation encountered (Pincus & Friedman, 2004). For example, Hampel and Petermann (2005) examined whether developmental differences would affect situation-specific coping in two stress domains: academic stressors and interpersonal stressors. Although inconsistent developmental differences were reported, results demonstrated that when confronted with academic stressors, youth engaged in significantly more problem-focused strategies (e.g., support seeking) than when confronted with interpersonal stressors. Controllability of the situation may influence an individual's coping style; for instance, problem-focused strategies may be favored in response to situations in which it is perceived that something constructive can be done whereas emotion-focused strategies are favored when coping with situations that are deemed uncontrollable and must therefore be accepted (Folkman & Lazarus, 1980).

There is evidence that coping strategies vary in relation to gender and age. In an early study, Nolen-Hoeksema, Larson, and Grayson (1999) found that females aged 25 to 75 were more prone to experience rumination and less mastery over stressful situations compared to their male counterparts, making them more vulnerable to experiencing depressive symptoms. This finding was supported by Hampel and Petermann (2005) who found that girls, aged 8 to 14 years, exhibited decreased emotional regulating strategies (e.g., minimization, distraction) and increased maladaptive emotion-focused coping strategies (e.g., rumination, resignation). In contrast, boys have been found to employ emotion-distraction coping strategies, which encourage problem-focused coping and provide a sense of control over the environment. Although such strategies are considered positive in that they have been associated with a

decrease in depressive symptoms, it has been suggested that emotion-distraction strategies may lead to increased aggression and conduct problems brought on because of boys' desire to achieve control over their environment (Compas, Orosan, & Grant, 1993). This finding was supported by results from Calvete and Cardeñoso (2005), which demonstrated that delinquent behavior in males aged 14 to 17 was partially attributed to an impulsive style of problem solving.

Coping style also varies according to age. Based on a review of previous studies, Pincus and Friedman (2004) conclude that from an early age, children can access and control their emotions and thoughts, yet they are lacking the knowledge and skills to use specific coping strategies when confronted with a stressful situation. Thus, young children are more likely to employ problem-focused strategies than emotion-focused strategies, which are usually acquired in late childhood and early adolescence (Pincus & Friedman, 2004). Hampel and Petermann's (2005) study support this finding by demonstrating that problem-based strategies (e.g., support seeking, positive self-instructions) are developed in early childhood. However, they also found that as age increased, adaptive strategies such as distraction and recreation diminished whereas maladaptive coping strategies (e.g., rumination, aggression) increased. This finding was supported in Hampel and Petermann (2006), in which it was reported that adolescents in Grade 6 and Grade 7 reported decreased adaptive coping and increased maladaptive coping strategies.

Preventive programs

With diminished coping capabilities in adolescence (Hampel & Petermann, 2005; 2006), there is a need for prevention efforts to buffer the effects of stress and promote adaptive coping during this developmental period (Frydenberg & Lewis, 2000). Since the concept of prevention has evolved over the last number of decades (Bloom & Gullotta, 2003), a discussion of the term is warranted. In the early 1950s, a public health and prevention medicine definition was put

forth by Leavell and Clark (1953), which was dominated by a medical model that also emphasized physical illness and populations at risk. An alternate perspective of prevention was introduced by Caplan (1964) that merged perspectives from psychiatry and epidemiology. This complex psychiatric definition is founded on the concepts of incidence and prevalence and distinguishes among three main types of prevention, which differ in their purpose and timing: primary, secondary, and tertiary (Bloom & Gullotta, 2003). Primary prevention takes place in typical populations to prevent future occurrence of problems whereas secondary prevention targets populations with early signs and symptoms to reduce their impact or shorten their duration, and tertiary prevention involves populations with established problems or disorders to reduce subsequent effects (Durlak, 1997).

The 1970s witnessed a new movement in prevention in which existing frameworks were challenged. Both the psychiatric and medical models of prevention were criticized as being pathology-oriented. However, with the President's Commission on Mental Health (1978), a strengths-based definition of primary prevention in mental health emerged, emphasizing the building of adaptive strengths and coping resources and the importance of targeting total populations rather than administering treatment on an individual basis (Bloom & Gullotta, 2003).

Over the last few decades, the view of primary prevention has expanded to not only include the prevention of specific problems, but to prevent emotional and behavioral issues and promote mental health in general (e.g., Durlak & Wells, 1997; O'Connell, Boat, & Warner, 2009). For example, Bloom and Gullota (2003) define primary prevention as "the promotion of health and the prevention of illness [involving] actions that help participants (or to facilitate participants helping themselves, (1) to prevent predictable and interrelated problems, (2) to

protect existing states of health and healthy functioning, and (3) to promote psychosocial wellness for identified populations of people" (p. 13).

Primary prevention programs contain distinctions in the way in which target populations are selected (Durlak, 1997). A universal or population-wide approach involves all individuals in the targeted population (e.g., all students in a specific school) whereas a high-risk approach or selective preventive program is directed at groups of individuals who are at risk of, but have not yet begun to exhibit signs of difficulties. A milestone or transition approach targets individuals who are nearing a major life transition or event, such as school transition or divorce. Such transitions can be particularly stressful and may produce adverse effects for the individual (Durlak, 1997; Durlak & Wells, 1997). Whereas primary prevention involves targeting healthy or typical individuals, the aim of secondary prevention or indicated prevention is to intervene with individuals who demonstrate early signs of difficulties (Durlak, 1997).

In addition to target population selection procedures, primary prevention programs can be distinguished based on their level of approach as individual-level or environment-centered. With the individual-level approach, the focus of prevention is at the level of the individual; individuals are worked with directly to prevent difficulties or to promote well-being, while environmental-centered programs attempt to promote change by targeting one's surrounding environment, such as the family, the peer group, the school or other social organization, the community, or even the physical environment. While separately defined in theory, these approaches are often combined in practice (Durlak, 1997).

Several authors have put forth recommendations for the development and implementation of effective preventive programs (e.g., Dryfoos, 1990; Durlak, 2014; Nation et al., 2003; Thapar et al., 2015; Weissberg & Greenberg, 1998; Weissberg, Kumpfer, & Seligman, 2003), and

effective school-based programs (Broderick & Metz, 2016). As summarized in Nation and colleagues (2003), effective preventive programs have several elements in common. First, they are comprehensive; they provide an array of clinical approaches to participants while targeting them in settings that have a primary influence (e.g., the school). Second, they have varied teaching methods. These involve interactive instruction and active, hands on experience, with opportunity to apply what is learned to real-life situations. Third, effective prevention programs have sufficient dosage; that is, participants require a certain level of exposure to the program for it to take effect. In addition, some form of follow-up or booster session is critical to support long term effects of the program. Fourth, effective prevention programs are theory-driven; they have theoretical underpinnings which support the justification of their use. Finally, they encourage positive relationships by providing opportunities for participants to develop strong connections with peers, teachers, and community members.

Although preventive programs with the abovementioned characteristics are effective, to maximize program effectiveness, it is important for such programs to cater to the needs of the target population. First, these programs should be appropriately timed; that is, the program should occur at a time in the participant's life that it will have the greatest impact. For example, the Institute of Medicine warns, "if the preventive program occurs too early, its positive effects may be washed out before onset; if it occurs too late the disorder may have already had its onset" (Mrazek & Haggerty, 1994, p. 14). In addition to its timing, it is important that the content of the program is tailored to the specific developmental needs of participants, including their cognitive and social development. Finally, effective preventive programs should be socioculturally relevant. Designing a program that is culturally appropriate is one way to increase relevance. Another way to increase relevance is by including participants in program planning and

implementation. In this sense, participants can provide input to ensure that their needs are recognized by way of the program.

In addition to these guidelines, Broderick and Metz (2016) put forth guidelines specific to school-based program research. Although their focus is on mindfulness-based programs, many of the elements generalize to all forms of school-based preventive programs. These elements are exemplified in the acronym SCHOOLS, outlined below.

S: Settings. When implementing school-based prevention programs, one of the first elements to consider is the setting and targeted level of the program. School-based programs may be implemented within the school curriculum or as an after-school program. In school-based settings, universal programs have numerous benefits when implemented. First, despite the reported prevalence of school-related stressors, many students suffering from stress and related difficulties may go undetected since there is often a greater need to address and prevent overt behavioral problems that disrupt the smooth functioning of the classroom setting (Fisher, Masia-Warner, & Klein, 2004; Weems et al., 2010). By targeting a broad range of students, universal programs maximize access to support. There are also other advantages associated with universal school-based programs. Such programs may minimize difficulties with screening, recruitment (Lock & Barrett, 2003), and prevent problems such as low participation and retention rates (Shochet et al., 2001). Moreover, when implemented universally, school-based programs can help avert potentially negative peer consequences and stigma likely to accompany the experience of being targeted for a preventive intervention program (Lock & Barrett, 2003; Tomb & Hunter, 2004; Weems et al., 2010). Over time, they also contribute to sustainability in the schools and foster consistent positive outcomes (Broderick & Metz, 2016; Hawkins, Kosterman, Catalano, Hill, & Abbott, 2005).

C: Curriculum. Researchers who develop a program curriculum should take care to ensure that the curriculum is well grounded theoretically, developmentally appropriate and demonstrates effective pedagogy. In selecting an appropriate school-based preventive program, several elements should be considered, including the program's existing evidence base and the developmental appropriateness of the program, including supplementary materials, such as workbooks and handouts (Broderick & Metz, 2016). For example, in their review of conducting developmentally-appropriate CBT with adolescents, Sauter and colleagues (2009) recommend to tailor language, materials, activities, and the pace of delivery to the needs of the young person. Similarly, in conducting developmentally-appropriate mindfulness practices with adolescents, recommendations include simplifying instructions to facilitate better understanding of the goals of mindfulness using props or concrete metaphors and reducing the duration of training activities, such as body scans and breathing exercises (Zelazo & Lyons, 2012). Another element that should be considered is the presence of an instructor's manual and instructor training. An instructor's manual should contain the conceptual model for the program, session objectives, and thematic activities. Instructor training that precedes or runs at the same time of the program is highly recommended (Broderick & Metz, 2016).

H: History of Program Approach. When conducting school-based program research, another important element to consider is the history of the program's approach. A solid understanding of the theoretical underpinnings can better shape program facilitators' grasp of existing program techniques, rationales, objectives, and assessments (Baer, 2015; Broderick & Metz, 2016).

O: Objectives. School-based programs have objectives, those of which should be clearly defined and linked to broader curricular goals. Defining program objectives and linking them to

broader curricular goals is vital to the sustainability of the program in educational settings (Broderick & Metz, 2016).

O: Outcomes. In measuring program effects, specific program components may be identified that contributed to positive outcomes in addition to those that did not. Although a mixed-methods approach is strongly recommended for program evaluation, at minimum, program effects should be measured before and immediately after the program (Broderick & Metz, 2016). Long-term follow-up assessment is particularly useful in building an evidence base for the program (Bond & Carmola Hauf, 2003).

L: Layout or design. The layout or design of a study contributes to its effectiveness. The randomized pre- and post-test control group design is ideal in program evaluation; however, this study design is not always feasible in schools (McDavid, Huse, & Hawthorn, 2013). As an alternative, the nonrandomized pre- and post-test comparison group design is often used. Instead of random assignment, a school is assigned to receive the program and pre- and post-test changes are compared to the pre- and post-test changes of a comparison group of students who do not receive the program. Minimally, one group of students should receive the program; effects are measured before and immediately after the program (Broderick & Metz, 2016; De Anda, 2007).

S: Sustainability. To ensure their success and sustainability in the school setting, school-based programs should be supported by a network of interested individuals, such as counselors, psychologists, administrators, and parents. These individuals might initially form a workgroup to take responsibility for program implementation and evaluation to ensure that measures are taken to provide opportunities for practice (e.g., mindfulness) that are accessible to the entire school community (Broderick & Metz, 2016). To further allow for sustainability in the school setting, ongoing instructor training and provision of regular in-services are recommended

(Han & Weiss, 2005).

The above section summarizes important elements that should be considered by researchers and educators when conducting school-based program research or implementing school-based programs. The section below provides a review of universal school-based stress management programs that have found to be effective, with the aim identifying specific components that contribute to their effectiveness.

Universal School-Based Stress Management Programs

Lowry-Webster, Barrett, and Dadds (2001) conducted one of the first studies examining universal school-based programs for the prevention of mental health disorders (Miller, 2008). The team implemented FRIENDS (Barrett, 1998), a universal school-based program targeting anxiety and depression in children and adolescents. FRIENDS is based on CBT, which is an evidence-based, symptom-focused treatment approach rooted in both cognitive therapy and behavior therapy (Rachman, 1997). CBT is built around the theoretical assumption that an individual's cognitions are largely influenced by previous experiences. Previous experiences may contribute to the development of schemas, which may influence the way in which individuals interpret future experiences (Beck, Rush, Shaw, & Emery, 1979). Therefore, a key component of this therapy is to identify and correct distorted thinking through a process known as cognitive restructuring (Beck, Emery, & Greenberg, 1985). Nevertheless, CBT is not limited to cognitive modification; rather, this treatment approach endorses both problem- and emotion-focused coping through the teaching of cognitive, behavioral, and social strategies deemed necessary to effect change (Beck et al., 1979; Hofmann & Asmundson, 2008; Kendall, 2012).

The FRIENDS program is a CBT-based preventive program designed to help children and youth develop effective coping strategies to manage situations that are difficult or anxiety

provoking in nature. The FRIENDS program addresses the three major processes associated with stress and anxiety (e.g., cognitive, physiological, behavioral), and provides skill instruction in each domain. FRIENDS teaches cognitive skills (e.g., positive self-talk, self-reward), physiological skills (e.g., relaxation, deep breathing), and behavioral skills (e.g., problem solving, reward systems; Barrett, 2005).

In a study examining the program's effectiveness, Lowry-Webster and colleagues (2001) examined pre- and post-program changes in anxiety and depression universally and for those who met the criteria for the anxiety and depression in children aged 10–13 years (n = 594). Children in the treatment group (n = 432) participated in the 10-session program whereas the remaining served as waitlist control group (n = 162). Following the program, children in the treatment group compared to children in the waitlist control group indicated fewer self-reported anxiety symptoms regardless of their risk status. Within the treatment group, 75.3% of children in the high anxiety group no longer reported clinically significant anxiety symptoms at post-test whereas within the control group, 54.8% of the children who were in the high anxiety group remained at risk at post-test. Also, within the treatment group, children in the high anxiety group reported decreased depressive symptoms at post-test (for a summary of universal CBT school-based programs, see Table 1).

Table 1. Summary of Universal CBT School-based Programs

Study	**Program**	**Duration**	**Study design**	**Participants**	**Measures**	**Main findings**
Lowry-Webster, Barrett, & Dadds (2001)	FRIENDS	10 sessions	Pre- and post-test control group design	Children aged 10–13 years, *n* = 594 (53% female) assigned to treatment group (*n* = 432); control group (*n* = 162)	Spence Children's Anxiety Scale (SCAS; Spence, 1994a; Spence, 1994b, cited in Spence 1997). Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978). Children's Depression Inventory (CDI; Kovacs, 1981).	All children (regardless of pre-test risk of anxiety) who received the program reported less anxiety at post-test compared to those who were in the wait-list control group. Within the treatment group, 75.3% of children in the high anxiety group no longer reported clinically significant anxiety symptoms at post-test. Conversely, within the control group, 54.8% of the children who were in the high anxiety group remained at risk at post-test. Within the treatment group, children in the high anxiety group reported decreased depressive symptoms at post-test.
Lowry-Webster, Barrett, & Lock (2003)	FRIENDS	10 sessions	Pre- and post-test control group design (with 12-month follow-up)	Children aged 10–13 years, *n* = 594 (53% female) assigned to treatment group (*n* = 432); control group (*n* = 162)	Includes above mentioned measures, and: Anxiety Disorders Interview Schedule for Children (ADIS-C third edition; Silverman & Albano, 1997). The Child Behaviour Checklist Revised (CBC - Revised;	Program gains had been largely maintained at 12-month follow-up as supported by results from self-reports and diagnostic interviews. Eighty-five percent of the children who had been assigned to the program group, and who had met the criteria for anxiety and depression, were found to be diagnosis-free compared to 31.2%

					Achenbach, 1991a).	of children in the control group.
Barrett, Lock, & Farrell (2005)	FRIENDS	10 sessions	Pre- and post-test control group design (with 12-month follow-up)	*n* = 692 Children in Grade 6, aged 9–10 (*n* = 293), and Grade 9, aged 14–16, (*n* = 399) assigned to treatment group (*n* = 423); control group (*n* = 269)	The Spence Child Anxiety Scale (SCAS; Spence, 1998). The Children's Depression Inventory (CDI; Kovacs, 1981).	At post-test, participants in moderate- and high-risk groups in both conditions demonstrated significant reductions in anxiety and depression. At 12-month follow-up, reductions in anxiety and depression were maintained in moderate- and high-risk groups in both conditions; however, the program condition demonstrated a greater reduction in anxiety than the control condition. Grade 6 participants demonstrated more significant reductions in anxiety compared to Grade 9 participants; however, at a 12-month follow-up, equal reductions were noted across both levels.
de Anda (1998)	Stress Management for Adolescents	10 sessions	Pre- and post-test control group design	Adolescents aged 12–14, *n* = 54 (70% female) assigned to treatment group (*n* = 36); control	Adolescent Stress and Coping Measure (ASCM; Bradley et al., 1990) State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)	Participants in the treatment group reported increases in the use of cognitive control coping strategies, increases in adaptive coping, decreased in stress, and increases in the ratio of adaptive to maladaptive coping strategies compared to those in the control group.

				group (n = 18)		
Frydenberg et al. (2004)	Best of Coping Skills (BOC)	10 sessions	**Study 1** Pre- and post-test design (with 6-month follow-up)	**Study 1** Grade 10 students, aged 16–17, n = 83 (53% female)	**Study 1** Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993)	**Study 1 and 2** Post-program increase in "Reference to Others" coping style (e.g., seek social, spiritual and professional help), with males demonstrating greater increases than females. Post-program decrease in "Non-productive" coping style (e.g., worry, self-blame) for "at risk" group (e.g., those who scored in low range CASQ and PCIS). Post-program decreases in "Non-productive" coping and increases in "Productive" coping for females; the opposite occurred for males. **Study 3 and 4** Post-program decrease in "Non-productive" coping style for program group and increase for control group. No significant impact of the program shown in the same school two years later (Study 4). **Summary** Modest support for the use of BOC
			Study 2 Pre- and post-test design	**Study 2** Grade 10 students, aged 16–17, n = 113 (50% female)	**Study 2** Children's Attribution Styles Questionnaire (CASQ; Seligman, 1995) Perceived Control of Internal States Questionnaire (PCIS; Pallant, 1998) Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993)	
			Study 3 Pre- and post-test control group design	**Study 3** Grade 7 students, aged 11–13, n = 88 (44% female) assigned to treatment group (n = 43); control	**Study 3** Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993) Perceived Control of Internal States Questionnaire (PCIS; Pallant, 1998)	

				group (n = 45)		with students, particularly with "at risk" students. Gender differences in coping reported post-program.
			Study 4 Pre- and post-test control group design	**Study 4** Grade 7 students, aged 11–13, n = 235 (43% female) assigned to treatment group (n = 179); control group (n = 56)	**Study 4** Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993)	
Hampel, Meier, & Kummel (2008)	Anti-Stress-Training (AST)	Six sessions	Pre- and post-test control group design (with three-month follow-up)	Adolescents, aged 10–14, n = 320 (50% female) assigned to treatment group (n = 138); control group (n = 182)	Training acceptance measure developed by the researchers Perceived stress measure developed by the researchers The German Coping Questionnaire for children and adolescents (Stressverarbeitungsfragebogen fur Kinder und Jugendliche; SVF-KJ; Hampel et al. 2001; cf. Hampel & Petermann, 2005) Self-efficacy (Based on a questionnaire developed by Jerusalem and Mittag, 1995)	Participants in the treatment group showed decreases in perceived stress and increases in coping and self-efficacy compared to those in the control group. Overall, younger participants demonstrated greater benefits from the program than older participants.

In a follow-up to the 2001 study, Lowry-Webster, Barrett, and Lock (2003) examined the long-term effects of FRIENDS and found that program gains had been largely maintained at 12-month follow-up as supported by results from self-reports and diagnostic interviews. At follow-up, 85% of the children who had been assigned to the treatment group, and who had met the criteria for anxiety and depression, were found to be diagnosis-free compared to 31.2% of children in the control group.

In a later study, Barrett, Lock, and Farrell (2005) compared the impact of the FRIENDS program on anxiety and depression at two developmental stages. Grade 6 students (n = 293) aged 9–10 years, and Grade 9 students (n = 399) aged 14–16 years were randomly assigned to either the FRIENDS program (n = 423) or to a no-treatment control group (n = 269). Based on their pre-program scores, participants were categorized into low-, moderate- and high-risk groups, and the effects of the program were then evaluated at post-program and at 12-month follow-up. At post-test, it was found that participants in moderate- and high-risk groups demonstrated significant reductions in anxiety and depression in both the treatment and control conditions. At 12-month follow-up, reductions in anxiety and depression were maintained in moderate- and high-risk groups in both conditions; however, the treatment condition demonstrated a greater reduction in anxiety than the control condition. With respect to developmental stage, Grade 6 participants demonstrated more significant reductions in anxiety compared to Grade 9 participants; however, at a 12-month follow-up, equal reductions were noted across both levels.

Overall, results from the studies briefly reviewed above provide evidence for the effectiveness of FRIENDS, a universal school-based program targeting anxiety and depression in children and youth. Several other universal CBT school-based stress management programs are

described below, with a focus on adolescent-targeted programs.

Universal CBT School-Based Stress Programs for Adolescents

In an earlier study, de Anda (1998) evaluated the effectiveness of a 10-week CBT school-based program for middle school adolescents based on an earlier, abridged program that had been developed for and implemented with pregnant and parenting teens (de Anda, Darroch, Davidson, Gilly, & Morejon, 1990). Participants aged 12–14 (n = 54; 70% female) were allocated to a treatment (n = 36) or no-treatment control condition (n = 18). Because of the small number of male participants involved in the study and the researcher's decision to allocate half of the males to the control condition, randomization was only possible for female participants. The program consisted of a psychoeducational component, in which participants were taught to recognize the signs and symptoms of stress, and to differentiate adaptive and maladaptive stress responses. The cognitive and physiological components focused on the identification of participants' cognitive and physiological reactions to stress, followed by instruction of a "Calm Body, Clear Mind" method, in which participants learned how to engage in muscle relaxation (e.g., progressive, scanning, conditioned, differential) and accurate self-talk. "Calming Actions," which consisted of release, talking about feelings, exercise, rest, and the use of distraction were taught to students. Finally, adolescents were instructed on how to effectively cope with stressful situations through problem solving. In-session practice of skills and homework were crucial components of the program.

Pre- and post-program changes in stress and coping were examined in participants in the treatment condition compared to students in the control group. Students who had participated in the stress management program reported increases in the use of cognitive control coping strategies, increases in adaptive coping, and increases in the ratio of adaptive to maladaptive

coping strategies compared to those who had not received the program. Furthermore, participants in the treatment group reported less stress following the program than those in the control group. Despite positive findings of the program, these results should be interpreted with caution due to the limited generalizability of the findings from the small sample size and self-selection in response to participant solicitation.

Frydenberg and colleagues (2004) investigated the effectiveness of The Best of Coping Skills Program (BOC; Frydenberg & Brandon, 2002), a school-based CBT program. The program, which was integrated into students' pastoral care program, consisted of 10 weekly one-hour sessions that targeted different themes in stress management, such as adaptive versus maladaptive coping, positive self-talk, cognitive appraisal, effective communication, problem solving, goal setting, and time management. The effectiveness study was broken down into two settings (Study 1–2 and Study 3–4). In Study 1–2, participants were Grade 10 students, aged 16–17 (Study 1, $n = 83$; Study 2, $n = 113$). All students completed measures prior to and following the program, which was delivered to students by an external facilitator. Students were then categorized in groups according to their scores on the Children's Attribution Styles Questionnaire (CASQ; Seligman, 1995) and Perceived Control of Internal States Questionnaire (PCIS; Pallant, 1998). High scoring students were labeled "resilient" whereas those who scored in the middle range comprised the "main" group. Low-scoring students were labeled "at-risk." At post-program, results indicated that there was an increase in the coping style, "Reference to Others" (e.g., seek social, spiritual, and professional help), with males showing greater increases than females. Further, compared to the "resilient" group, the "at-risk" group's use of "Non-productive" coping (e.g., worry, self-blame) decreased. Post-program decreases in "Non-productive" coping and increases in "Productive" coping for females were noted whereas the

opposite was noted for males.

In Study 3–4, a total of 323 Grade 7 students aged 11–13 were assigned to program and no-treatment control conditions. In Study 3, program delivery was performed by the teachers in conjunction with the school psychologist in the same classroom. Training in program delivery included a two-day in-service with a psychologist. In Study 4, three teachers and a school psychologist were trained in the same fashion as in Study 3; however, they were then asked to train the remaining ten pastoral care teachers in a more condensed version of the training. In Study 3, an evaluation of the program revealed a decrease in "Non-productive" coping style for participants in the treatment group and an increase for those in the control group at post-program. In Study 4, the program was delivered in the same school two years later, showing no significant impact on students' coping style.

Overall, the four studies yielded modest support for the use of BOC with students for coping skills improvement, particularly with "at risk" students, but they also caution that gender differences should be considered when developing such programs given reports of opposing effects on males and females. The program was found to have a maximum impact in Study 3, when it was delivered collaboratively by the school psychologists and the teachers who had received a more thorough training than the limited training teachers had received in Study 4.

Hampel, Meier, and Kummel (2008) evaluated the effectiveness of Anti-Stress Training (AST; Hampel & Petermann, 2003), a school-based CBT program designed for early and middle adolescents. AST is a six-week training program that teaches CBT strategies, such as cognitive restructuring, self-control techniques, problem solving, modeling, and role play. The AST program also addresses subjects related to stress management such as stress theory, coping, recovery activities, positive self-instruction, repetition, and consolidation and transfer into daily

life. Adolescents, aged 10–14 (n = 320; 50% female) were assigned to either the treatment group in which students participated in the AST program (n = 138) or to the no-treatment control group (n = 182). Participants completed measures of perceived stress, self-efficacy, and adaptive coping at pre-test, post-test, and at three-month follow-up. Overall results demonstrated positive treatment effects. Participants in the treatment condition showed improvements in perceived stress, self-efficacy, and adaptive coping compared to the control group. Finally, age differences were noted, with early adolescents demonstrating greater overall improvement than older participants. Several limitations are of note, including the non-randomized design of the study and the no-treatment control group.

School-Based Mindfulness Programs

CBT has been a dominant treatment modality for a range of disorders in both an individual therapeutic context and in the school setting; however, mindfulness-based programs are increasingly receiving support as an effective treatment for stress and related issues (Roeser, 2014; Vøllestad, Nielsen, & Nielsen, 2012). Mindfulness, the deliberate act of focusing attention on the present moment, albeit nonjudgmentally, endorses emotion-focused coping: particularly, emotion regulation, distress tolerance, and selective attention. One of the main goals of mindfulness is to increase awareness of the present moment with an open and accepting attitude that welcomes all experiences, both positive and negative (Hayes, 2004; Kabat-Zinn, 1990). Efforts to rid oneself of unwanted thoughts, feelings and sensations, or what is known as experiential avoidance, may in fact have a counteractive effect on individuals (Hayes, Strosahl, & Wilson, 1999). Conversely, mindfulness encourages individuals to adopt a non-judgmental, present-centered attitude in spite of the unpleasant thoughts and feelings experienced in the process (Forman, Herbert, Moitra, Yeomans, & Geller, 2007). Existing programs that are

mindfulness-based have their roots in Eastern meditation practice (Gu, Strauss, Bond, & Cavanagh, 2015). The application of mindfulness into Western psychology is largely due to the advancement of standardized programs, such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002; 2013). These secular approaches are group-based and teach mindfulness skills through an array of formal and informal practices, including mindfulness of breath, thoughts, bodily sensations, sounds, and everyday activities (Gu et al., 2015).

Research on the effects of mindfulness programs has demonstrated many benefits in adults in clinical and non-clinical samples, including decreased stress (Shapiro, Brown, & Biegel, 2007), lower anxious and depressive symptomology (Kabat-Zinn et al., 1992; Miller, Fletcher, & Kabat-Zinn, 1995), improved psychological symptoms, empathy ratings, and spiritual experiences (Astin, 1997; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). Empirical support for the use of mindfulness programs with adolescents is more limited; however, studies have documented improvements in attention (e.g., Bögels, Hoogstad, van Dun, De Shutter, & Restifo, 2008; Zylowska et al., 2008), and reductions in anxiety, depression, somatic, and externalizing symptoms (e.g., Biegel, Brown, Shapiro, & Schubert, 2009).

There is increasing support for the use of mindfulness in educational settings (Roeser, 2014). At the elementary level, studies have demonstrated that mindfulness may improve academic performance, reduce behavior problems (e.g., Semple, Reid, & Miller, 2005), increase attention (Napoli, Krech, & Holley, 2005; Semple, Lee, Rosa, & Miller, 2010), reduce test anxiety (Carsley, Heath, & Fajnerova, 2015; Napoli, Krech, & Holley, 2005), and promote social and emotional competence (Schonert-Reichl & Lawlor, 2010). At the high school level, numerous benefits have also been noted among students who participate in mindfulness

programs, including decreased negative affect, decreased somatic symptoms, increased self-acceptance (Broderick & Metz, 2009), decreased behavior problems (Bögels et al., 2008; Singh et al., 2007), increased attention (Bögels et al., 2008), increased emotional regulation (Broderick & Metz, 2009; Metz et al., 2013), reduced stress, anger, and better concentration (Campion & Rocco, 2009). Several universal mindfulness school-based programs for adolescents will be reviewed below.

Universal Mindfulness School-Based Programs for Adolescents

Broderick and Metz (2009) evaluated a pilot trial of Learning to BREATHE, a six-session school-based program for adolescents designed to cultivate students' development of emotional-regulation and wellbeing through the practice of mindfulness. Each lesson contains a different theme, such as body awareness, understanding, and working with feelings and reducing harmful self-judgments. At the beginning of each lesson, an introduction of the topic is provided, followed by activities to incite group participation and discussion. Mindfulness practice in-class and at-home are part of the program. For at-home practice, workbooks and CDs are provided to students. Adolescents, aged 17–19 years comprised the treatment group in which students participated in the Learning to BREATHE program (n = 120; 100% female) and junior adolescents from the same high school, aged 16–17 years, comprised the no-treatment control group (n = 30; 100% female); however, only data from 17 junior participants were usable for comparison due to incomplete records or absences.

Participants in the treatment and control groups completed measures of affect, emotion regulation, ruminative response, and somatic complaints at pre-test and post-test. At post-test, students who participated in the program reported decreased negative affect, fatigue, aches and pain, and increases in feelings of calmness, relaxation and self-acceptance. They also

demonstrated greater emotion regulation and awareness of feelings compared to participants in the control group. Despite the encouraging results, several limitations were of note. These include the use of a relatively homogeneous sample, which impacts generalizability of program findings to other groups differing in gender or SES, and the use of a no-treatment comparison group. The no-treatment comparison was comprised of a small number of junior students, calling into question whether program gains were apparent because of senior students' increased cognitive and emotional maturity (for a summary of universal mindfulness school-based programs see Table 2).

Table 2. Summary of Universal Mindfulness School-based Programs

Study	Program	Duration	Study design	Participants	Measures	Main findings
Broderick & Metz (2009)	Learning to BREATHE	6 sessions	Pre- and post-test control group design	Adolescents, aged 17–19 years, assigned to treatment group (*n* = 120; 100% female) Adolescents, aged 16–17 years, assigned to control group *(n* = 17; 100% female)	Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) Somatization Index of the Child Behavior Checklist (SICBC; Achenbach, 1991b)	Participants in the treatment group reported reduced negative affect, decreased somatic complaints, increased feelings of calmness, relaxation and self-acceptance, and increased emotion regulation. They also reported greater awareness of their feelings and emotions.
Metz et al. (2013)	Learning to BREATHE	6 sessions	Pre- and post-test control group design	Grade 10 to Grade 12 students (*n* = 216), assigned to treatment group (*n* = 129; 65% female); control group (*n* = 87; 67% female)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) Items from Somatization Index of the Child Behavior Checklist (Achenbach, 1991b), Worry and Anxiety Questionnaire (Dugas et al., 2001), and the symptom checklist created for the survey of Health Behaviour in School-aged Children (Haugland & Wold, 2001) Perceived Stress	Participants in the treatment group reported decreased difficulty regulating emotions, reduced psychosomatic complaints, and perceived stress.

Schonert-Reichl & Lawlor (2010)	Mindfulness Education (ME)	10 sessions	Pre- and post-test control group design	Grade 4 to Grade 7 students, aged 9–13 (n = 246), assigned to the treatment group (n = 139; 50% female); control group (n = 107; 47% female)	Resiliency Inventory (RI; Song 2003) Self-Description Questionnaire (Marsh, 1988) Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) Teachers' Rating Scale of Social Competence (TRSC; Kam & Greenberg, 1998)	Participants in the ME condition demonstrated increased social and emotional competence, and improvements in positive emotions (e.g., optimism) Regarding general self-concept, pre-adolescents in the ME condition showed improvements whereas pre-adolescents did not.
Huppert & Johnson (2010)	Short modified version of the mindfulness program developed by Kabat-Zinn (2003)	4 sessions	Pre- and post-test control group design	Adolescents, aged 14–15 (n = 134; 100% male), assigned to treatment group (n = 78); control group (n = 56)	Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2006) Ego-Resiliency Scale (ERS; Block & Kremen, 1996) Warwick–Edinburgh Mental Well-being Scale (WEMWBS; Tennant et al., 2007) Big-Five personality dimensions (McCrae & Costa, 1987)	In the treatment condition, there was a positive correlation between mindfulness practice outside of the classroom and improvement on measures of mindfulness and psychological well-being. Furthermore, 69% of the students in the treatment group reported having enjoyed learning about mindfulness, and 74% of the students indicated that they would continue to practice mindfulness on a regular basis.
Sibinga	MBSR	12 sessions	Pre- and	Grade 7 to Grade	State-Trait Anger	Participants in the MBSR condition

et al. (2013)	program, adapted for use with urban youth in a school setting		post-test control group design (with three-month follow-up)	8, aged 11–14 (*n* = 41; 100% male), assigned to treatment group (*n* = 22) or an active control group (*n* = 19) program	Expression Inventory (STAXI-2; Forgays, Forgays, & Spielberger, 1997) Symptom Checklist-90R (SCL-90-R; Derogatis, 1994) Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) Children's Depression Inventory (CDI; Kovacs, 2004) Multidimensional Anxiety Scale for Children (MASC; March, Sullivan, & Parker, 1999) To measure sleep quality, participants completed paper sleep diaries and wore a Respironics, Mini Mitter Actiwatch, wrist actigraph to measure sleep activity. To assess the cortisol stress, a Salivette device (Sarstedt, Newton, NC) was used.	showed less anxiety, less rumination, and reduced negative coping. Furthermore, a trend toward increased cortisol levels was noted among participants in the active control group but not among MBSR participants. Results from the data provided by the wrist actigraphs and sleep diaries showed no differences between groups.

The effectiveness of the Learning to BREATHE program was further evaluated by Metz and colleagues (2013). Grade 10 to Grade 12 students (n = 216) were assigned to a treatment group (n = 129; 65% female) and no-treatment control group (n = 87; 67% female). Participants completed measures evaluating emotion regulation, perceived stress, and somatic complaints at pre- and post-test. Results revealed increases in emotion regulation skills and reductions in perceived stress and psychosomatic symptoms. Despite its promising evidence, the study employed a no-treatment control group comprised of adolescents who received instruction as usual, calling into question the strength of treatment effects. Other limitations included the generalizability of the sample, a lack of diversity of measurement methods, and an absence of follow-up.

The Learning to BREATHE program was also evaluated with a sample of 27 ethnically diverse at-risk Grade 9 to Grade 12 students (Bluth et al., 2016). Although the sample size was small, post-program results revealed improvements in mental health outcomes, including mindfulness, anxiety, and depression in the treatment group relative to the control condition, which provides preliminary support for the effectiveness of the program with ethnically diverse at-risk adolescents.

Schonert-Reichl and Lawlor (2010) evaluated the effectiveness of Mindfulness Education (ME), a school-based program for pre- and early adolescents developed to promote social and emotional competence and positive emotions through mindful attention training. The 10-week ME program consisted of topics, such as quieting the mind and focusing on the breath, mindful attention (e.g., paying attention to sensations, thoughts, and feelings), “managing negative emotions and negative thinking” (p. 143), and acknowledging oneself as well as others. Participants were Grade 4 to Grade 7 students, aged 9–13 (n = 246). Students were assigned to

the ME program (n = 139; 50% female) or to a wait-list control group (n = 107; 47% female), and they completed measures of optimism, general and school self-concept, and positive and negative affect at pre-test and at post-test. Compared to controls, participants in ME condition demonstrated increased social and emotional competence, and improvements in positive emotions (e.g., optimism). With respect to general self-concept, pre-adolescents in the ME condition showed improvements whereas pre-adolescents did not. Several limitations must be considered, including the non-randomized design of the study, and the lack of follow-up assessment.

Huppert and Johnson (2010) reported the evaluation of a short, modified school-based version of the mindfulness program developed by Kabat-Zinn (2003). The mindfulness program comprised four 40-minute classes, which took place once a week for four weeks. Topics included awareness and acceptance, and incorporated exercises, such as bodily awareness, mindful breathing, awareness of sounds, and walking meditation. Additionally, participants were provided with three 8-minute audio files of mindfulness exercises, which they were encouraged to practice outside of the classroom. Adolescents, aged 14–15 *(*n = 134; 100% male) were assigned to either a treatment group (n = 78) or to a no-treatment control group (n = 56), and completed measures of resilience and psychological well-being. Results demonstrated that the more mindfulness practice the individual engaged in outside of the classroom, the more evident the improvement on measures of mindfulness and psychological well-being. Furthermore, 69% of the students in the mindfulness group reported having enjoyed learning about mindfulness and 74% of the students indicated that they would continue to practice mindfulness on a regular basis. Although there is positive support for the brief program, several limitations must be considered. These include the homogeneous sample, the lack of random

assignment to treatment and control groups, and the use of a no-treatment control group.

Sibinga and colleagues (2013) evaluated a MBSR program, which was adapted for use with urban youth in a school setting. The program, taught by an instructor trained in mindfulness instruction for youth, consisted of 12 weekly 50-minute sessions that were integrated into the school day. Participants were Grade 7 to Grade 8 students, aged 11–14 (n = 41; 100% male), and were randomly assigned to either the MBSR condition (n = 22) or to an active control group, which received a health education program (n = 19) that was adapted from the Glencoe Health Curriculum (McGraw Hill, 2005). Data were collected at three time points: baseline, post-program, and at three-month follow-up to assess anxiety, psychological functioning, coping, and mindfulness. Participants completed sleep diaries to measure sleep quality and wore a wrist actigraph to monitor rest and activity cycles. Salivary cortisol was also collected to assess stress response using a Salivette device (Sarstedt, Newton, NC) and analyzed using a FDA-approved enzyme immunoassay (Salimetrics, State College, PA). Following the programs, participants in the MBSR condition exhibited less anxiety, less rumination, and reduced negative coping. Furthermore, a trend toward increased cortisol levels was noted among participants in the active control group but not among MBSR participants. Results from the data provided by the wrist actigraphs and sleep diaries showed no differences between groups. As evidenced by the study's results, there is support for the use of MBSR in school settings with urban male youth. Strengths of the study include use of an active control group, the use of both psychological and physiological assessment of participants; however, due to the small sample size and homogeneous nature of the sample, caution should be exercised when generalizing results.

In a later study, Sibinga, Webb, Ghazarian, and Ellen (2016) evaluated the adapted MBSR program with a much larger, more diverse sample of students (n = 300; m_{age} = 12.0;

50.7% female) using only psychological measures. The study's results provide further support for the use of mindfulness-based stress management programs in the school: At post-program, participants in the MBSR condition demonstrated significant improvements in mental health outcomes compared to those in the active control condition, which suggests that their improvements may be due to the mindfulness components of the program.

Overall, findings from the above review demonstrate that effective universal school-based stress management programs share common elements. First, as demonstrated by the CBT-based stress management programs reviewed, psychoeducation is an essential component of such programs and includes instruction about stress such as its signs, symptoms, adaptive, and maladaptive properties (e.g., de Anda, 1998; Hampel et al., 2008). Another element shared by the programs is the teaching of evidence-based strategies for stress management, such as CBT or mindfulness-based techniques. The strategies taught are not only theoretical, but they also incorporate in-class practice that students could actively participate in, such as muscle relaxation in CBT-based stress management programs (e.g., de Anda, 1998), and bodily awareness, mindful breathing, awareness of sounds, and walking meditation in mindfulness-based stress management programs (e.g., Broderick & Metz; Huppert & Johnson, 2010). In addition to in-class practice, some of the school-based stress management programs reviewed also have at-home practice or homework built in, shedding light on the importance of incorporating an element of follow-up in the design of the program to ensure maintenance of program gains outside the classroom (e.g., Broderick & Metz, 2009; de Anda, 1998; Huppert & Johnson, 2010). Finally, a common element shared by the programs is that they provide opportunity to reduce mental health related stigma among adolescents. As mentioned earlier, universal programs can help reduce stigma associated with being targeted for a particular program (Lock & Barrett,

2003; Tomb & Hunter, 2004; Weems et al., 2010). Stigmatizing attitudes related to mental health, which often include the view that the experience of mental health difficulties presents a weakness, are a barrier to seeking help (Corrigan & Rüsch, 2002; Corrigan, 2004; Gary, 2005; Schomerus & Angermeyer, 2008; Thornicroft, 2008). These attitudes often emerge in adolescence, which makes this developmental period an opportune time to address them (Chandra & Minkovitz, 2007; Ke et al., 2015). Although stigma reduction is not always emphasized explicitly in youth stress management programs (Chandra & Minkovitz, 2007), their mere universal nature provides a means of stigma reduction around the experience of difficulty handling stress.

Findings from the programs evaluated earlier provide encouraging support for the use of stress management programs in the schools; however, some limitations are apparent. For example, most of the studies reviewed implement a non-randomized design. In their study, Huppert and Johnson (2010) describe how the classes that received the intervention and control programs were taught by different teachers, which may have influenced students' response to the program. Thus, to reduce bias, it is important to randomly assign participants to the intervention and control conditions (Viera & Bangdiwala, 2007); however, randomization by individual student is not always feasible in schools (McDavid, Huse, & Hawthorn, 2013). To employ a randomized design in the school setting, randomization by class has been proposed (de Anda, 2007).

Apart from the study by Sibinga and colleagues (2013), another limitation shared by the stress management program evaluations reviewed earlier is that they employ a no-treatment comparison group design. The drawback of this design is that it cannot demonstrate whether effects are the result of components that are specific to the program or if they are due to factors

common factors inherent to different treatment modalities (Karlsson & Bergmark, 2015). To parse out program effects, it may be more beneficial to use an active control group consisting of participants who receive a similar program to those in the treatment group without including its key ingredient (Kirsch, 2005).

Summary and Unique Contribution

Adolescent stress is a risk factor for the development of mental illness (Auerbach et al., 2011; Byrne et al., 2007; Rudolph, 2002; Waaktaar et al., 2004). As coping capabilities reportedly diminish during this developmental period (Hampel & Petermann, 2005; 2006), preventive programs that promote adaptive coping to buffer the detrimental effects of stress are recommended (Frydenberg & Lewis, 2000). The school is an ideal context for the implementation of such programs. In this setting, access to support is maximized since common barriers associated with program access in clinical settings (e.g., cost, transportation) are reduced (Lock & Barrett, 2003). Yet, there are also challenges associated with school-based program implementation. Time is often an issue, and consequently, lengthy programs are likely to be rejected by schools (Bishop et al., 2006; Dusenbury et al., 2003). Standard effective universal stress management programs consist of six to twelve weekly sessions of 40 to 50 minutes (e.g., Broderick & Metz, 2009; Frydenberg et al., 2004; Sibinga et al., 2013) whereas abridged programs can consist of four sessions of 40 to 50 minutes (e.g., Huppert & Johnson, 2010). To maximize feasibility of program implementation, researchers have called upon program developers to simplify programs to make them more appealing to schools (Dusenbury & Hansen, 2004). One way to do this is by developing single-session programs, which have been found to be effective in school settings for alcohol and drug prevention (e.g., Dempster et al., 2006) and for reducing stigma around mental illness (e.g., Ke et al., 2015).

StressOFF was created to address the lack of single-session school-based programs for stress management. A review of evidence-based CBT and mindfulness school based-stress management programs led to the development of StressOFF. Although CBT-based strategies are extensively researched and practiced, mindfulness-based strategies are gaining increased support for stress management and are being used more frequently in school-based settings (e.g., Broderick & Metz, 2009; Schonert-Reichl & Lawlor, 2010). StressOFF is the first program known to combine strategies from both approaches in a single-session format.

Research Objectives and Hypotheses

The overall aim of the present study was to evaluate the effectiveness of StressOFF, a single-session stress management program. In considering the limitations of the program evaluation studies reviewed earlier, the present study employed a pre-test, post-test design in which classes were randomly assigned to a treatment or control group. In accordance with Sibinga and colleagues (2013)'s study, an active control group was designated as the comparison group. Students in the active control condition received a single-session study skills program (Be PREPARED). Specific objectives and associated hypotheses of the present study were based on a previous evaluation study of StressOFF (Shapiro et al., 2016), which reported on the feasibility and acceptability of the program. Prior to the receiving StressOFF, Shapiro and colleagues (2016) found that most participants surveyed reported limited strategy use and knowledge about stress and stress management, with participants indicating frequent use of general or non-specific stress management strategies (e.g., distraction, taking a deep breath). Immediately following participation in the program, students reported high program satisfaction, including high levels of understanding and willingness to use strategies. Taking into account the

inclusion of an active control group and a follow-up component in the present study, the objectives and hypotheses of the were modified and evaluated the following:

(a) students' prior experiences with stress management (e.g., knowledge and use of stress management pre-program). *It is hypothesized that students in both the StressOFF and Be PREPARED conditions will report comparable experiences with stress management prior to the program. Students in both groups will report limited knowledge of stress and stress management and moderate interest in knowing about stress and stress management. The majority of students will report not using management techniques pre-program and no previous stress management instruction. Students will also report a moderate frequency of management strategy use and moderate perceived ability to manage their stress.*

(b) students' change in perceived stress, mindfulness and test anxiety levels pre-program and at one-month follow-up. *It is hypothesized that students in the StressOFF condition will report less perceived stress, greater mindfulness and less test anxiety from pre-program to one-month follow-up. It is hypothesized that students in the Be PREPARED group will experience no change in perceived stress, mindfulness and test anxiety from pre-program to one-month follow-up.*

(c) students' amount learned, level of difficulty of program, overall program rating and recommendation to a friend at immediate post-program and one-month follow-up. *It is hypothesized that students in the StressOFF condition will report a greater amount learned, a greater level of difficulty of program, greater overall program rating and higher recommendation to a friend than students in the Be PREPARED condition at immediate post-program and at one-month follow-up. It is hypothesized that amount*

learned, level of difficulty of program, overall program rating and recommendation to a friend will be maintained from immediate post-program to one-month follow-up for both groups.

(d) students' understanding and willingness to use strategies immediately post-program and at one-month follow-up. *At immediate post-program, it is hypothesized that students in the StressOFF condition will report moderate to high levels of understanding of and willingness to use taught strategies. It is hypothesized that these levels will be maintained at one-month follow-up. At immediate post-program, it is also hypothesized that students in the Be PREPARED condition will report moderate to high levels of understanding of and willingness to use taught strategies. It is hypothesized that these levels will be maintained at one-month follow-up*

Chapter 2. Research Design and Methodology

Method

Participants. The overall sample for this study consisted of 227 Grade 9 to Grade 11 students from 27 classes in four public and three private secondary schools in Montreal, Quebec, Canada. Classes were randomly assigned by coin toss to the treatment group (58% male, 42% female) of 13 classes (n = 89), with a mean age of 16.14 (SD = 0.87), or to the control group (44% male, 57% female) of 14 classes (n = 138), with a mean age of 16.51 (SD = 0.79). The schools were categorized as middle SES suburban (43%) to high SES independent fee-based (57%). All students (N = 502) were offered and completed a workshop on effective stress management. Forty-five percent of these students returned signed student assent and parent consent forms and were included in the current study (n = 227).

StressOFF Program Summary. StressOFF Strategies© is a single-session (45 minute) school-based stress management program that aims to equip teenagers with the necessary coping skills to effectively manage stress. The development of the program content was guided by a review of evidence-based adolescent stress management programs. The program consists of four key components: (a) psychoeducation, (b) stigma reduction, (c) coping skills (CBT and mindfulness-based strategies), and (d) follow-up (pamphlet and online resources).

Psychoeducation. In the psychoeducation component of the program, students are provided with a definition of stress, including its adaptive and maladaptive components. Cognitive, physiological, and behavioral manifestations of stress are presented. Students are then asked to fill out a stress profile, allowing them to identify the cognitive, physiological, and behavioral expressions of their own stress. This profile helps students better understand how their stress manifests itself, and to accordingly tailor their coping responses, which are addressed

in the second half of the program. All definitions provided are developmentally appropriate and make use of interactive diagrams, images, and animations, to help facilitate student understanding of difficult concepts.

Stigma reduction. The program begins and ends with a video of real students (not actors) who share their experience with stress in high school. In this video, student participants are spoken to directly with understanding of their struggles with stress and reassurance that there are coping strategies available to help manage their stress. Additionally, examples of celebrities are carefully chosen to illustrate real-life scenarios of cognitive, physiological, and behavioral manifestations of stress. The judicious incorporation of celebrity examples also demonstrates to students that difficulty handling stress is a universal experience.

Coping skills. The strategies from CBT and mindfulness that were selected for the program target the cognitive, physiological, and behavioral signs of stress. Together they form the acronym **STRESS** – for **S**top, **T**hought challenge, **RE**laxation, **S**potlight, and **S**elf-care and better choices – which can make it easier for students to recall and access the strategies.

Cognitive strategy: Stop and Thought Challenge. Students are presented with a negative thought, such as "I'm a complete failure." The facilitator proceeds to tell students when they experience a negative thought as such to first *stop* and take a deep breath. The second step is to challenge the thought (e.g., thought restructuring), by asking oneself: If a friend came up to me and articulated this same thought, would I affirm this statement? Students in turn understand that they should challenge a negative thought in the same way they would if a friend were in the same situation; that is, with compassion and understanding.

Physiological strategy: Relaxation. Students are introduced to an inconspicuous form of relaxation that can be used anywhere and at any time: progressive muscle relaxation (PMR).

PMR reduces physiological stress by progressively tensing and then relaxing each muscle group in the body (Bernstein & Borkovec, 1973). To illustrate the physiological benefits of PMR, the facilitator guides students through a three-minute exercise while sitting at their desks. Students have the option of keeping their eyes open or closed.

Cognitive/physiological/behavioral strategy: Spotlight. With the spotlight strategy, students are taught how to become aware of the present moment without judgment: just by "observing" (mindfulness). The spotlight is also an inconspicuous strategy that can be employed at any time. It is particularly effective as a grounding strategy when experiencing overwhelming thoughts and feelings. To illustrate the strategy, the facilitator guides students through a step-by-step spotlight activity that helps students control their attention while they practice to gently turn their focus to the moment-by-moment experience of their senses (e.g., the feeling of their feet touching the ground, the sounds that come to their ears). Finally, they are guided through turning their focus to their breath, without trying to change or alter anything.

Behavioral strategy: Self-care and better choices. Students are encouraged to reflect on the choices they make when feeling stressed and whether these choices may induce further stress. For example, consciously and strategically making healthy lifestyle choices, such as eating well, getting enough sleep and exercising at the very time when stress is higher and it is hardest to do so is highlighted. Students are also urged to access their support network or to seek help when having trouble managing their stress.

Follow-up. Following the program, students are given a pamphlet that outlines the information provided in the workshop, including the strategies and links to online resources.

Program evaluation. In a pilot study, which was conducted prior to the present study, StressOFF was evaluated for feasibility and acceptability. Participants were 565 Grade 9

students (57% female; M_{age} = 14.97, SD = 0.36) who completed self-report measures of stress and stress management strategy use prior to participating in StressOFF. Following the program, participants completed self-report measures assessing satisfaction with program, understanding of and future willingness to use strategies taught. Pre-program results revealed that 35.04% of participants reported a moderate to high overall stress level, with all participants initially reporting limited use of stress management strategies (e.g., distraction, taking a deep breath). Post-program results revealed that 88.67% of participants rated the program as good to excellent with over 87% of participants reporting that they understood the strategies quite well to very well, and 76–87% of participants indicating high levels of willingness to use each strategy. Overall, females reported higher levels of stress, greater satisfaction with the program, and greater understanding and willingness to use strategies (Shapiro et al., 2016).

Be PREPARED Program Summary. Be PREPARED is a single-session adolescent-targeted study skills-based stress management program that aims to equip teenagers with strategies to effectively manage their stress. Like StressOFF, the development of program content was also guided by a review of evidence-based adolescent stress management programs and consists of the same four main components: (a) psychoeducation, (b) stigma reduction, (c) coping skills, and (d) follow-up (pamphlet and online activities). However, StressOFF teaches students CBT and mindfulness based coping skills to effectively manage stress whereas the coping skills selected for the Be PREPARED program are study skills-based and collectively form the acronym **PREPARED** – for **P**rioritization, **RE**ading strategies, **P**omodoro technique, **A** good study space, **RE**lease, and **D**evices for memory.

Prioritization. With the prioritization strategy, students are taught to categorize tasks in terms of ABC priority, which can usually be accomplished depending on the due date of the

assignment. For example, if an assignment is due in a week, but the student has a test in a couple of days, the test would be categorized as "Priority A" while the assignment would be named "Priority B." A project due in a month would be categorized as "Priority C." Accordingly, assignments, tests, and projects can also be categorized as A, B, or C priority in terms of the weighting of the assignment, test, or project.

Reading strategies. To make better use of their time, students are encouraged to use the right type of reading strategy for the correct type of reading they are doing, whether it is "study reading," "skimming," or "scanning." Study reading includes reading more in depth, slower, and at a higher level of comprehension; skimming entails reading large amounts of text in a short time to obtain the general idea about the reading material, and scanning involves quickly locating a specific piece of information within the text.

Pomodoro technique. The Pomodoro technique is a time management technique. This technique uses a timer to break down tasks into 25-minute intervals with five-minute breaks in between. Students are encouraged to work on the task until the timer rings, to take the five-minute break and to repeat this cycle until the task is complete.

A good study space. Students are encouraged to think about their study space; particularly, they are encouraged to reflect on where they feel they work best (e.g., home, library, school). Students are asked to think about the actual environment of the study space, such as clutter, lighting, and seating, as well as factors that help or hinder productivity, such as background noise or listening to music.

Release. Relaxation is an important part of stress management. Students are encouraged to try deep breathing, stretching, taking a walk, engaging in a physical activity, and talking to a friend or an adult when feeling stressed.

Devices for memory. Students are shown two types of mnemonics, acrostics and acronyms, for memory aid.

Program implementation. The principal researcher and two research assistants delivered the programs to students. The research assistants were two undergraduate students and were specifically trained to deliver StressOFF and Be PREPARED. Program training consisted of a 45-minute training session by the principal researcher. During this training, the assistant was provided with a detailed script of the stress management program and accompanying PowerPoint presentation. The script provided step-by-step instructions to facilitate training and ensure treatment integrity.

Procedure

English language school boards in the Montreal area were contacted. Once board approval was granted, the primary researcher contacted principals and vice principals to request access to the schools. When access was permitted, the schools received a letter explaining the program of research (see Appendix A). An oral script (see Appendix B) was presented to students upon dissemination of the informed consent forms, which were sent home to parents of students in participating classes at participating schools (see Appendix C). Students were also asked to provide informed assent (see Appendix D).

Twenty-seven Grade 9 to Grade 11 participating classes from two school boards were randomly assigned to either the CBT and mindfulness-based stress management program (StressOFF) or to the study skills-based stress management program (Be PREPARED). The procedure was identical for both conditions. The programs and data collection took place in classes of 10 to 35 students in their classrooms. Classrooms were equipped with a Smart Board or a screen and LCD projector to display the accompanying PowerPoint presentation. Data was

collected in groups by the primary researcher and her volunteers prior to the stress management program (pre-program), immediately following the program (immediate post-program), and at one-month follow-up.

At pre-program, students filled out a brief self-report questionnaire to evaluate their prior experiences with stress management (Student's prior experiences with stress management questionnaire; Appendix E). At pre-program, they also filled out measures evaluating perceived stress (Perceived Stress Scale - Adapted; PSS, Cohen, Kessler, & Underwood Gordon, 1995; Appendix F), mindfulness (Mindfulness Attention Awareness Scale; MAAS, Brown & Ryan, 2003; Appendix G), and test anxiety (Revised Test Anxiety Scale; RTAS, Benson & El-Zahhar, 1994; Appendix H). Altogether, pre-program measures took approximately 15 minutes to complete. At immediate post-program, students filled out a brief self-report questionnaire (Students' response to program questionnaire; StressOFF Strategies; Appendix I; or Students' response to program questionnaire; Be PREPARED; Appendix J), which took approximately five minutes to complete. In this questionnaire, students had the opportunity to evaluate the program and provide feedback. Depending on whether they participated in the StressOFF or Be PREPARED program, questionnaire items alluding to strategy use were modified to include the names of the strategies used by the different programs.

At one-month follow-up, students completed the perceived stress (Perceived Stress Scale - Adapted; PSS, Cohen et al., 1995; Appendix F), mindfulness (Mindfulness Attention Awareness Scale; MAAS, Brown & Ryan, 2003; Appendix G), and test anxiety (Revised Test Anxiety Scale; RTAS, Benson & El-Zahhar, 1994; Appendix H) measures, as well as the Students' response to program questionnaire (for StressOFF Strategies, see Appendix I; for Be PREPARED, see Appendix J).

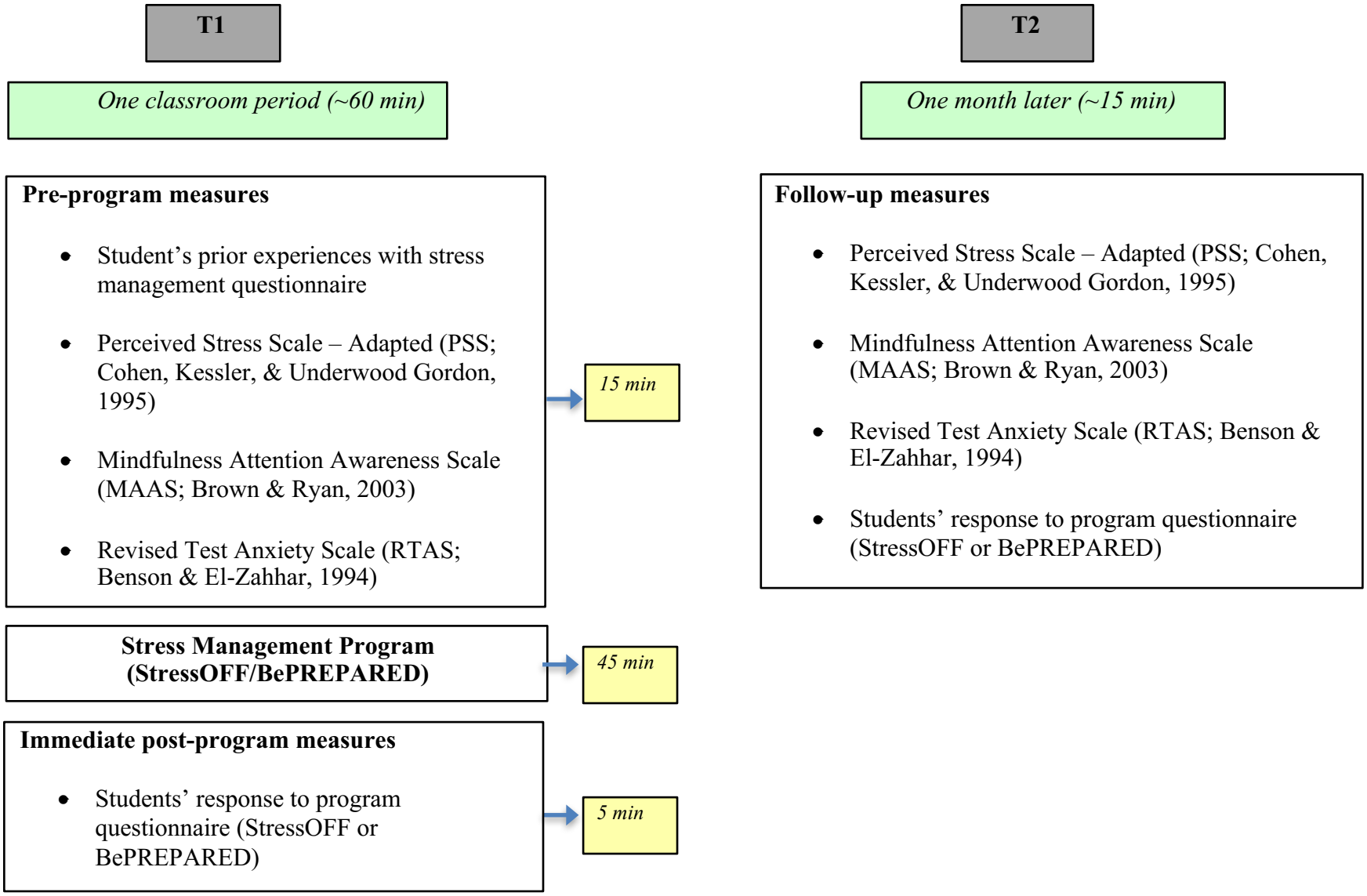

Figure 1. Research Time Table

Measures

Pre-program measures.

Students' prior experiences with stress management questionnaire. This questionnaire was developed by the principal researcher to examine students' experiences with stress management pre-program. Students were asked to rate their knowledge of stress management on a Likert-type 4-point scale ranging from "nothing at all" to "a lot" and to rate their interest in learning about stress management on a Likert-type 4-point scale ranging from "not at all interested" to "very interested". They were also asked to indicate if they had received previous stress management instruction (yes/no), whether they used stress management techniques (yes/no), and to identify their strategies of choice from a list of possible stress management techniques, including deep breathing, guided relaxation exercises, meditation, and distraction (e.g., reading, listening to music, watching TV). Finally, participants were asked to rate their frequency of use of stress management techniques on a Likert-type 4-point scale ranging from "never" to "very often" and to rate their ability to manage their stress on a Likert-type 4-point scale ranging from "not at all good" to "very good."

Perceived stress scale (PSS). Perceived stress was assessed by ten items on the Perceived Stress Scale (PSS; Cohen et al., 1995), adapted by the researchers. The PSS is a widely-used measure of overall stress in which students are asked to report how often they had been burdened by feelings of uncontrollability (e.g., "…felt that you were unable to control the important things in your life"), unpredictability (e.g., "…been upset because of something that happened unexpectedly), and inability to cope with stressors (e.g., "…questioned your ability to handle your personal problems") in the previous month. Items are evaluated on a 5-point Likert scale, ranging from "never" to "very often". The researchers adapted the wording of the items to

eliminate reverse scoring. By doing this, summation was facilitated for students, who were asked to calculate their own stress score. Their score, which could range from 0 (minimum) to 40 (maximum) was later referred to in the program. Although they were not required to share their score, students were given an idea of the severity of their stress level when presented with a breakdown of the categories of scores as designated by the researchers: 0–20 (mild), 21–30 (moderate), and 31–40 (high). The PSS has good internal consistency (α = .85) and test-re-test reliability ranging from .75 to .86 (Cohen, Kamarck, & Mermelstein, 1983). In the present study, the PSS was shown to have a Cronbach alpha of .92 at T1 and .96 at T2 (see Table 3).

Table 3

Cronbach's Alphas for Test Anxiety, Perceived Stress, and Mindfulness Scales at T1 and T2

	n	α	Min Possible	Max Possible
T1				
Test Anxiety Scale	211	.94	25	100
Perceived Stress Scale	222	.92	0	40
Mindfulness Scale	213	.85	15	60
T2				
Test Anxiety Scale	219	.96	25	100
Perceived Stress Scale	218	.96	0	40
Mindfulness Scale	219	.93	15	60

Mindfulness Attention Awareness Scale (MAAS). Mindfulness was assessed by the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The MAAS is comprised of 15 items designed to evaluate individuals' presence or absence of present moment awareness in day-to-day experiences (e.g., "I could be experiencing some emotion and not be conscious of it until sometime later"). Respondents are asked to evaluate the frequency of the day-to-day experience on a 6-point Likert ranging from "almost always" to "almost never." Higher scores indicate higher levels of mindfulness. Internal consistency of the measure is good among both student (α = .82) and adult samples (α = .87; Brown & Ryan, 2003). In the present study, the MASS was shown to have a Cronbach alpha of .85 at T1 and .93 at T2.

Revised Test Anxiety Scale (RTAS). The Revised Test Anxiety Scale (RTAS; Benson & El-Zahhar, 1994) consists of 25 items measured on a 4-point Likert scale. The original 18-item RTAS was developed in part by merging the Test Anxiety Inventory (TAI; Spielberger, 1980) and the Reactions to Tests Scale (RTS; Sarason, 1984), and it was later refined to add precision to the subscales, namely the Bodily Symptoms dimension. The current 25-item RTAS is based on a four-factor test anxiety model as proposed by Sarason (1984): *Worry* ("During tests I find myself thinking about the consequences of failing"), *Tension* ("During tests I feel very tense"), *Test-irrelevant thinking* ("During tests I find myself thinking of things unrelated to the material being tested"), and *Bodily Symptoms* ("I get a headache during an important test"). The overall scale has good reliability (α = .89), as do the subscales, with Cronbach alphas of .71 for the worry and tension subscales, .74 for the Test-Irrelevant Thinking subscale, and .78 for the Bodily Symptoms subscale. Internal consistency was reported as .91 for the overall scale and ranged from .81 to .89 for the four subscales. In the present study, the RTAS was shown to have a Cronbach alpha of .94 at T1 and .93 at T2.

Immediate post-program measures.

Students' response to program questionnaire. This questionnaire was developed by the principal researcher to evaluate students' response to the programs. Participants were asked to rate how much they learned after participating in the program on a Likert-type 4-point scale ranging from "nothing" to "a lot," and they were asked to rate the level of difficulty of the program on a Likert-type 4-point scale ranging from "not sure" to "too complicated." Participants were also asked to indicate their understanding of specific stress management strategies taught in the StressOFF program (e.g., Stop Thought, Relaxation, Spotlight, Self-care and better choices) and the strategies taught in the Be PREPARED program (e.g., Prioritize, REading strategies, Pomodoro technique, A good study space, RElease, Devices for memory) on a Likert-type scale ranging from "not very well" to "very well." They were also asked to rate their willingness to use the strategies learned in StressOFF and Be PREPARED on a Likert-type scale ranging from "never: I don't like this technique" to "always." Finally, participants were asked to rate the program on a Likert-type 4-point scale ranging from "poor" to "excellent."

One-month follow-up measures.

Perceived stress scale (PSS), Mindfulness Attention Awareness Scale (MAAS), Revised Test Anxiety Scale (RTAS) and students' response to program questionnaire (see above for more information).

Chapter 3. Analyses and Results

The overall aim of the study was to compare the effectiveness of a single-session school-based stress management prevention program (StressOFF) to an active control group, a single-session study-skills program (Be PREPARED). Specific objectives were to report (a) students' prior experiences with stress management (e.g., knowledge and use of stress management pre-program); (b) students' change in perceived stress, mindfulness and test anxiety levels from pre-program to one-month follow-up; (c) students' perceptions of amount learned, level of difficulty of program, overall program rating, recommendation to a friend at immediate post-program and at one-month follow-up; and (d) students' understanding and willingness to use strategies at immediate post-program and at one-month follow-up.

Prior to conducting the analyses, skewness was assessed and all variables were normally distributed, falling within two standard deviations of the mean. To determine the study's sample size, a power analysis using G*Power v3.1.0 was used. The analysis considered a medium effect size of .25, a power of 95%, a significance level of .05, and a repeated measures ANOVA. Based on the calculation, a minimum number of overall participants of 54 (27 per group) was determined. In the current study, there were 89 students in the StressOFF group (39.21%) and 138 (60.79%) in the Be PREPARED group, with 112 males (49.33%) and 115 females (50.66%) as participants (see Table 4).

Table 4

Frequencies for Two Independent Variables (Group, Gender)

	Male	Female	Total Group	
StressOFF	52	37	89	39.21%
	58.42%	41.57%		
Be PREPARED	60	78	138	60.79%
	43.48%	56.52%		
Total Gender	112	115		
	49.33%	50.66%		

Seven schools were involved in the study. A chi-square test for independence was run to test whether there were any differences in distribution between groups by school. No significant differences were found (see Table 5).

Table 5

Distribution of Programs by School

	StressOFF		Be PREPARED		Total	
	n	Percent	*n*	Percent	*n*	Percent
School A*	19	55.88%	15	44.12%	34	14.97%
School B	19	38.78%	30	61.22%	49	21.59%
School C	12	50.00%	12	50.00%	24	10.57%
School D	5	25.00%	15	75.00%	20	8.81%
School E*	11	47.83%	12	52.17%	23	10.13%
School F	12	26.67%	33	73.33%	45	19.82%
School G*	11	34.38%	21	65.63%	32	14.10%

Note. *Indicates private schools

Students' Prior Experiences with Stress Management

At pre-program, students were asked to report their knowledge of stress and stress management, their interest in knowing about stress and stress management, whether they had been taught stress management techniques, and if students had used stress management techniques. At that time, they were also asked to report the frequency in which they used stress management techniques and their perceived ability to manage stress. Chi-square tests for independence were run to test whether there were any differences between the StressOFF and Be PREPARED groups. No significant differences between the groups were found; participants in the StressOFF and Be PREPARED groups reported comparable experiences with stress management prior to the program (see Table 6).

When asked to report their knowledge of stress and stress management pre-program, 69.66% of StressOFF participants reported that they knew “nothing at all” to “a bit” about stress and stress management compared to 67.39% of Be PREPARED participants. When asked to report their interest in knowing about stress and stress management pre-program, 78.65% of StressOFF participants reported that they were “a bit interested” to “quite interested” in knowing about stress and stress management compared to 77.54% of Be PREPARED participants. When asked whether they had been taught stress management techniques pre-program, 54.50% of StressOFF participants reported “no” compared to 44.20% of Be PREPARED participants. When asked if they used stress management techniques pre-program, 72.40% of StressOFF participants reported “yes” compared to 68.80% of Be PREPARED participants. When asked to report the frequency in which they used stress management techniques pre-program, 73.03% of StressOFF participants reported that they used stress management strategies “sometimes” to “very often” compared to 67.15% of Be PREPARED participants. When asked to report their perceived ability to manage stress pre-program, 79.77% of StressOFF participants reported that they were “somewhat good” to “pretty good” at managing their stress compared to 72.46% of Be PREPARED participants.

Table 6

Students' Prior Experiences with Stress Management

		Nothing at all	A bit	Quite a bit	A lot	χ^2	*df*	*p*
Knowledge of Stress and Stress Management	StressOFF	10 11.20%	52 58.40%	24 27.00%	3 3.40%	2.27	3	.518
	Be PREPARED	8 5.80%	85 61.60%	39 28.30%	6 4.30%			
		Not at all interested	A bit interested	Quite interested	Very Interested			
Interest in Knowing About Stress and Stress Management	StressOFF	4 4.50%	36 40.40%	34 38.20%	15 16.90%	0.6	3	.896
	Be PREPARED	6 4.30%	49 35.50%	58 42.00%	25 18.10%			
		No	Yes					
Having Been Taught Stress Management Techniques	StressOFF	48 54.50%	40 45.50%			3.85	1	.146
	Be PREPARED	61 44.20%	77 55.80%					

Table 6 Continued

		No	Yes			χ^2	*df*	*p*
Use of Stress Management Techniques	StressOFF	24 27.60%	63 72.40%			3.46	1	.176
	Be PREPARED	43 31.20%	95 68.80%					

		Never	Almost never	Sometimes	Very Often			
Frequency of Stress Management Strategy Use	StressOFF	6 6.70%	18 20.20%	54 60.70%	11 12.40%	2.73	3	.603
	Be PREPARED	10 7.30%	35 25.50%	70 51.10%	22 16.10%			

		Not at all good	Somewhat good	Pretty good	Very Good			
Perceived Ability to Manage Stress	StressOFF	12 13.50%	41 46.10%	30 33.7	6 6.70%	2.15	3	.542
	Be PREPARED	27 19.60%	63 45.70%	37 26.80%	11 8.00%			

Students were asked to identify specific strategies they used prior to the program. No significant differences between groups were found; however, "Distraction" was the most commonly used technique among both groups, with 74.16% of StressOFF participants and 73.72% of Be PREPARED participants reporting this strategy. The second most commonly used strategy among both groups was "Talk to a Friend," with 52.81% of StressOFF participants and 54.35% of Be PREPARED participants reporting this strategy. The third most commonly used strategy among both groups was "Deep Breathing," with 51.69% of StressOFF participants and 51.45% of Be PREPARED participants reporting this strategy. "Guided Relaxation" was the least used strategies for both groups, with 5.6% of StressOFF participants and 8.0% of Be PREPARED participants reporting this strategy (see Table 7).

Table 7

Chi Square of Group by Use of Specific Strategies

		No	Yes	χ^2	*df*	*p*
Deep Breathing	StressOFF	43	46	0.00*	2	.972
		48.31%	51.69%			
	Be PREPARED	67	71			
		48.55%	51.45%			
Guided Relaxation	StressOFF	84	5	0.46	2	.499
		94.38%	5.62%			
	Be PREPARED	127	11			
		92.03%	7.97%			
Meditation	StressOFF	80	9	0.13	2	.719
		89.89%	10.11%			
	Be PREPARED	126	12			
		91.30%	8.70%			
Mindfulness	StressOFF	76	13	0.25	2	.619
		85.39%	14.61%			
	Be PREPARED	121	17			

Table 7 Continued

		No	Yes	χ^2	*df*	*p*
Yoga	StressOFF	84 94.38%	5 5.62%	3.28	2	.070
	Be PREPARED	120 86.96%	18 13.04%			
Talk to Adult	StressOFF	61 68.54%	28 31.46%	2.69	2	.101
	Be PREPARED	108 78.26%	30 21.74%			
Talk to Friend	StressOFF	42 47.19%	47 52.81%	0.05	2	.820
	Be PREPARED	63 45.65%	75 54.35%			
Positive Self-Talk	StressOFF	60 67.42%	29 32.58%	1.39	2	.328
	Be PREPARED	103 74.64%	35 25.36%			
Exercise	StressOFF	51 57.30%	38 42.70%	0.42	2	.520
	Be PREPARED	85 61.59%	53 38.41%			
Take a Walk	StressOFF	64 71.91%	25 28.09%	1.11	2	.292
	Be PREPARED	90 65.22%	48 34.78%			
Distraction	StressOFF	23 25.84%	66 74.16%	0.01	2	.942
	Be PREPARED	36 26.28%	101 73.72%			

Table 7 Continued

		No	Yes	χ^2	*df*	*p*
Other Techniques	StressOFF	83 93.3%	6 6.7%	0.78	2	.377
	Be PREPARED	124 89.9%	14 10.1%			

Note. *Actual value is 0.001

Students' Perceived Stress, Mindfulness and Test Anxiety Levels Pre-program and at One-month Follow-up

Tables 8 through 10 present the results from one-way between-groups analysis of covariance (ANCOVA) conducted to compare the effectiveness of StressOFF and Be PREPARED on students' perceived stress, mindfulness, and test anxiety levels pre-program (T1) and at one-month follow-up (T2). The independent variable was program group and the dependent variable was participants' T2 scores of perceived stress, mindfulness, and test anxiety. Participants' T1 scores of perceived stress, mindfulness, and test anxiety were used as the covariate in this analysis.

An ANCOVA was run to test whether there was a difference between program group and participants' T2 scores of perceived stress while controlling for their T1 stress scores. There was no significant difference in T2 stress scores for participants in the StressOFF and Be PREPARED groups after controlling for their T1 stress scores; however, T1 scores were significant predictors of T2 stress scores, $F(1, 190) = 236.32$, $p < .001$, partial eta squared = .55, explaining 55.4% of the variance in T2 stress scores (see Table 8).

Table 8

Analysis of Covariance on Group and T2 Perceived Stress Scores While Controlling for T1 Perceived Stress Scores

Group		*M*	*SD*	*n*
StressOFF	T1	18.78	8.65	77
	T2	17.34	9.20	76
Be PREPARED	T1	21.60	9.07	124
	T2	18.73	10.69	117

	F	*p*	Partial Eta Squared
Group	1.55	.214	.01
T1 Perceived Stress	236.32	.000	.55

An ANCOVA was run to test whether there was a difference between program group and participants' T2 scores of mindfulness while controlling for their T1 mindfulness scores. There was no significant difference in T2 mindfulness scores for participants in the StressOFF and Be PREPARED groups after controlling for their T1 mindfulness scores; however, T1 mindfulness scores were significant predictors of T2 mindfulness scores, $F(1, 205) = 252.89$, $p < .001$, partial eta squared = .55, explaining 55.2% of the variance in T2 mindfulness scores (see Table 9).

Table 9

Analysis of Covariance on Group and T2 Mindfulness Scores While Controlling for T1 Mindfulness Scores

Group		*M*	*SD*	*n*
StressOFF	T1	61.76	12.75	84
	T2	64.88	15.27	82
Be PREPARED	T1	59.26	12.88	129
	T2	60.92	16.74	126

	F	*p*	Partial Eta Squared
Group	0.81	.368	.00
T1 Mindfulness	252.89	.000	.55

An ANCOVA was run to test whether there was a difference between program group and participants' T2 scores of test anxiety while controlling for their T1 test anxiety scores. There was no significant difference in T2 test anxiety scores for participants in the StressOFF and Be PREPARED groups after controlling for their T1 test anxiety scores; however, T1 test anxiety scores were significant predictors of T2 test anxiety scores, $F(1, 203) = 481.55$, $p < .001$, partial eta squared = .70, explaining 70.3% of the variance in T2 test anxiety scores (see Table 10).

Table 10

Analysis of Covariance on Group and T2 Test Anxiety Scores While Controlling for T1 Test Anxiety Scores

Group		*M*	*SD*	*n*
StressOFF	T1	53.51	15.38	84
	T2	50.31	17.10	81
Be PREPARED	T1	56.22	16.50	127
	T2	52.82	19.28	125

	F	*p*	Partial Eta Squared
Group	.07	.79	.00
T1 Test Anxiety	481.55	.00	.70

Tables 11 through 13 present the results from a repeated measures ANOVA with one between-subjects variable and one within-subjects variable. The repeated measures ANOVA was conducted to compare the effectiveness of StressOFF and Be PREPARED on students' perceived stress, mindfulness and test anxiety levels pre-program (T1) and at one-month follow-up (T2). The independent variable was program group (between-subjects) and the dependent variable consisted of participants' T1 and T2 scores of perceived stress, mindfulness, and test anxiety (within-subjects).

A repeated measures ANOVA was run to compare StressOFF and Be PREPARED participants' perceived stress levels at T1 and T2. Results of the repeated measures ANOVA revealed a significant main effect for time. There was no significant interaction for time and group, and no significant main effect for group. StressOFF participants reported significantly

lower perceived stress at T2 compared to T1. Also, Be PREPARED participants reported significantly lower perceived stress at T2 compared to T1 (see Table 11).

Table 11

Repeated Measures ANOVA for Perceived Stress

		M	*SE*	Lower Bounds	Upper Bounds	*F*	*df*	*p*
StressOFF	T1	18.75	1.01	16.75	20.75	19.98	1	.000
	T2	17.34	1.16	15.05	19.63			
Be PREPARED	T1	21.86	0.82	20.24	23.47			
	T2	18.73	0.94	16.88	20.57			

A repeated measures ANOVA was run to compare StressOFF and Be PREPARED participants' mindfulness levels at T1 and T2. Results of the repeated measures ANOVA revealed a significant main effect for time. There was no significant interaction for time and group, and no significant main effect for group. StressOFF participants reported significantly higher mindfulness at T2 compared to T1. Also, Be PREPARED participants reported significantly higher mindfulness at T2 compared to T1 (see Table 12).

Table 12

Repeated Measures ANOVA for Mindfulness

		M	*SE*	Lower Bounds	Upper Bounds	*F*	*df*	*p*
StressOFF	T1	61.88	1.42	59.08	64.67	9.62	1	.002
	T2	64.88	1.79	61.36	68.40			
Be PREPARED	T1	59.14	1.14	56.89	61.40			
	T2	60.92	1.44	58.08	63.76			

A repeated measures ANOVA was run to compare StressOFF and Be PREPARED participants' test anxiety levels at T1 and T2. Results of the repeated measures ANOVA revealed a significant main effect for time. There was no significant interaction for time and group, and no significant main effect for group. StressOFF participants reported significantly lower test anxiety at T2 compared to T1. Also, Be PREPARED participants reported significantly lower test anxiety at T2 compared to T1 (See Table 13).

Table 13

Repeated Measures ANOVA for Test Anxiety

		M	*SE*	Lower Bounds	Upper Bounds	*F*	*df*	*p*
StressOFF	T1	53.14	1.80	49.59	56.68	18.45	1	.000
	T2	50.31	2.05	46.27	54.35			
Be PREPARED	T1	56.17	1.45	53.32	59.02			
	T2	52.82	1.65	49.57	56.08			

Students' Perceptions of Amount Learned, Level of Difficulty of Program, Overall Program Rating, and Recommendation to a Friend from Immediate Post-program to One-month Follow-up

Table 14 present the results from a repeated measures ANOVA with one between-subjects variable and one within-subjects variable. The repeated measures ANOVA was conducted to compare StressOFF and Be PREPARED on students' amount learned, level of difficulty of program, overall program rating and recommendation to a friend at pre-program (T1) and at one-month follow-up (T2). The independent variable was program group (between-subjects) and the dependent variable consisted of participants' T1 and T2 scores of amount learned, level of difficulty of program, overall program rating, and recommendation to a friend (within-subjects).

For amount learned, results of the repeated measures ANOVA revealed a significant main effect for time, and a significant main effect for group. There was no significant interaction for time and group. Both groups significantly decreased in their reports of amount learned over time, with StressOFF participants reporting a significantly higher amount learned at T1 and T2 than Be PREPARED participants at T1 and T2.

For level of difficulty of the program, results of the repeated measures ANOVA revealed a significant main effect for time. There was no significant main effect for group and no significant interaction for time and group. Both groups significantly decreased in their reports of level of difficulty of program over time, with StressOFF participants reporting a significantly lower level of difficulty of the program at T2 compared to T1 and Be PREPARED reporting a significantly lower level of difficulty of the program at T2 compared to T1.

For program rating, results of the repeated measures ANOVA revealed a significant main effect for time, and a significant main effect for group. There was no significant interaction for time and group. Both groups significantly decreased in their reports of program rating over time, with StressOFF participants reporting a significantly higher program rating at T1 and T2 than Be PREPARED participants at T1 and T2.

For recommendation to a friend, results of the repeated measures ANOVA revealed a significant main effect for time. There was no significant main effect for group and no significant interaction for time and group. Both groups significantly decreased in their reports of recommendation to a friend over time, with StressOFF participants reporting a significantly lower level of recommendation to a friend at T2 compared to T1 and Be PREPARED reporting a significantly lower level of recommendation to a friend at T2 compared to T1.

Table 14

Repeated Measures ANOVA for Students' Amount Learned, Level of Difficulty of Program, Overall Program Rating and Recommendation to a Friend

		M	*SD*	*n*		*F*	*df*	*p*
Amount Learned								
T1	StressOFF	2.00	0.74	85	Group	11.37	2, 202	.001
	Be PREPARED	1.73	0.69	119	Time	26.15	1, 202	.000
T2	StressOFF	1.79	0.73	85	Group* Time	0.81	1, 202	.368
	Be PREPARED	1.43	0.82	119				
Level of Difficulty of Program								
T1	StressOFF	1.68	0.66	85	Group	2.45	1, 202	.119
	Be PREPARED	1.65	0.51	119	Time	23.60	1, 202	.000
T2	StressOFF	1.51	0.72	85	Group* Time	2.46	1, 202	.119
	Be PREPARED	1.30	0.73	119				
Program Rating								
T1	StressOFF	3.10	0.63	87	Group	3.42	1, 209	.016
	Be PREPARED	3.01	0.72	124	Time	96.19	1, 209	.000

Table 14 Continued

		M	*SD*	*n*		*F*	*df*	*p*
T2	StressOFF	2.72	0.64	87	Group*Time	2.03	1, 209	.156
	Be PREPARED	2.50	0.76	124				
Recommend to a Friend								
T1	StressOFF	2.93	0.55	86	Group	0.111	1, 206	.739
	Be PREPARED	2.96	0.59	122	Time	74.07	1, 206	.000
T2	StressOFF	2.59	0.66	86	Group*Time	1.35	1, 206	.246
	BePREPARED	2.52	0.61	122				

Students' Understanding and Willingness to Use Strategies Immediately Post-program and at One-month Follow-up

Within-group differences from T1 to T2 in the level of understanding of each strategy taught in the StressOFF program (Stop Thought, Relaxation, Spotlight, Self-care and better choices) were shown (see Table 15). When asked to report their understanding of the Stop Thought strategy, 91.01% of StressOFF participants reported understanding the strategy "quite well" to "very well" at T1 compared to 77.01% of participants at T2. Participants reported significantly less understanding of the Stop Thought strategy at T2 compared to T1. When asked to report their understanding of the Relaxation strategy, 100% of participants reported understanding the strategy "quite well" to "very well" at T1 compared to 95.40% of participants at T2. Participants reported significantly less understanding of the Relaxation strategy at T2 compared to T1. When asked to report their understanding of the Spotlight strategy, 91.01% of participants reported understanding the strategy "quite well" to "very well" at T1 compared to 80.46% of participants at T2. Participants reported significantly less understanding of the Spotlight strategy at T2 compared to T1. When asked to report their understanding of the Self-care and better choices strategy, 100% of participants reported understanding the strategy "quite well" to "very well" at T1 compared to 90.80% of participants at T2. Participants reported significantly less understanding of the Self-care and better choices strategy at T2 compared to T1.

Table 15

Paired T-test on the Difference Between T1 and T2 in Understanding of Stress OFF Strategies (n = 82)

		M	*SD*	*SEM*	*t*	*df*	*p*
Stop Thought	T1	2.34	.64	.07	3.97	86	.000
	T2	1.98	.66	.07			
Relaxation	T1	2.66	.48	.05	2.62	86	.010
	T2	2.46	.59	.06			
Spotlight	T1	2.54	.66	.07	5.33	86	.000
	T2	2.08	.69	.07			
Self-care and better choices	T1	2.71	.46	.05	4.36	86	.000
	T2	2.36	.65	.07			

A second analysis in the StressOFF group looked at whether there was a change in participants' willingness to use each strategy taught in the StressOFF program (Stop Thought, Relaxation, Spotlight, Self-care and better choices) from T1 to T2 (see Table 16). When asked to report their willingness to use the Stop Thought strategy, 78.31% of StressOFF participants reported that they were willing to use the strategy "sometimes" to "always" at T1 compared to 66.67% of participants at T2. Participants reported a significant decrease in willingness to use the Stop Thought strategy from T1 to T2. When asked to report their willingness to use the Relaxation strategy, 94.12% of StressOFF participants reported that they were willing to use the strategy "sometimes" to "always" at T1 compared to 91.14% of participants at T2. Participants reported a significant decrease in willingness to use the Relaxation strategy from T1 to T2.

When asked to report their willingness to use the Spotlight strategy, 81.93% of StressOFF participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 69.44% of participants at T2. Participants reported a significant decrease in willingness to use the Spotlight strategy from T1 to T2. When asked to report their willingness to use the Self-care and better choices strategy, 94.12% of StressOFF participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 82.67% of participants at T2. Participants reported a significant decrease in willingness to use the Self-care and better choices strategy from T1 to T2.

Table 16

Paired T-test on the Difference Between T1 and T2 in Willingness to Use StressOFF Strategies

		n	*M*	*SD*	*SEM*	*t*	*df*	*p*
Stop Thought	T1	73	2.36	.98	.11	4.90	72	.000
	T2		1.88	.78	.09			
Relaxation	T1	78	2.87	.76	.09	3.04	77	.000
	T2		2.53	.82	.09			
Spotlight	T1	68	2.49	.94	.11	3.73	67	.000
	T2		1.97	.83	.10			
Self-care and better choices	T1	73	2.86	.84	.10	5.03	72	.000
	T2		2.34	.87	.10			

Within-group differences from T1 to T2 in the level of understanding of each strategy taught in the Be PREPARED program (Prioritize, Reading strategies, Pomodoro, A good study space, Release, Devices for memory) were shown (see Table 17). When asked to report their understanding of the Prioritize strategy, 99.22% of Be PREPARED participants reported understanding the strategy "quite well" to "very well" at T1 compared to 95.45% of participants at T2. Participants reported significantly less understanding of the Prioritize strategy at T2 compared to T1. When asked to report their understanding of the Reading strategy, 94.57% of Be PREPARED participants reported understanding the strategy "quite well" to "very well" at T1 compared to 87.12% of participants at T2. Participants reported significantly less understanding of the Reading strategy at T2 compared to T1. When asked to report their understanding of the Pomodoro strategy, 94.57% of Be PREPARED participants reported understanding the strategy "quite well" to "very well" at T1 compared to 73.85% of participants

at T2. Participants reported significantly less understanding of the Pomodoro strategy at T2 compared to T1. When asked to report their understanding of a good study space strategy, 99.22% of Be PREPARED participants reported understanding the strategy “quite well” to “very well” at T1 compared to 93.13% of participants at T2. Participants reported significantly less understanding of a good study space strategy at T2 compared to T1. When asked to report their understanding of the Release strategy, 94.57% of Be PREPARED participants reported understanding the strategy “quite well” to “very well” at T1 compared to 83.97% of participants at T2. Participants reported significantly less understanding of the Release strategy at T2 compared to T1. When asked to report their understanding of the Devices for memory strategy, 96.12% of Be PREPARED participants reported understanding the strategy “quite well” to “very well” at T1 compared to 78.79% of participants at T2. Participants reported significantly less understanding of the Devices for memory strategy at T2 compared to T1.

Table 17

Paired T-test on the Difference Between T1 and T2 in Understanding of Be PREPARED Strategies

		n	*M*	*SD*	*SEM*	*t*	*df*	*p*
Prioritize	T1	124	2.69	.48	.04	2.57	123	.011
	T2	124	2.53	.58	.05			
Reading Strategies	T1	124	2.48	.60	.05	3.45	123	.001
	T2	124	2.28	.66	.06			
Pomodoro	T1	123	2.63	.59	.05	6.54	122	.000
	T2	123	2.15	.79	.07			
A Good Study Space	T1	122	2.80	.43	.04	3.28	121	.001
	T2	122	2.58	.60	.05			
Release	T1	123	2.57	.59	.05	4.27	122	.000
	T2	123	2.24	.69	.06			
Devices for Memory	T1	124	2.56	.57	.05	5.32	123	.000
	T2	124	2.14	.74	.07			

A second analysis in the Be PREPARED group looked at whether there was a change in participants' willingness to use each strategy taught in the Be PREPARED program (Prioritize, Reading strategies, Pomodoro, A good study space, Release, Devices for memory) from T1 to T2 (see Table 18). When asked to report their willingness to use the Prioritize strategy, 95.12% of Be PREPARED participants reported that they were willing to use the strategy "sometimes" to "always" at T1 compared to 90.76% of participants at T2. Participants' willingness to use the Prioritize strategy did not show a significant change from T1 to T2. When asked to report their

willingness to use the Reading strategy, 92.24% of Be PREPARED participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 77.27% of participants at T2. Participants’ willingness to use the Reading strategy did not show a statistically significant change from T1 to T2. When asked to report their willingness to use the Pomodoro strategy, 75.44% of Be PREPARED participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 62.38% of participants at T2. Participants reported a significant decrease in willingness to use the Pomodoro strategy from T1 to T2. When asked to report their willingness to use A good study space strategy, 93.44% of Be PREPARED participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 93.04% of participants at T2. Participants’ willingness to use A good study space strategy did not show a statistically significant change from T1 to T2. When asked to report their willingness to use the Release strategy, 94.26% of Be PREPARED participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 82.88% of participants at T2. Participants reported a significant decrease in willingness to use the Release strategy from T1 to T2. When asked to report their willingness to use Devices for memory strategy, 87.29% of Be PREPARED participants reported that they were willing to use the strategy “sometimes” to “always” at T1 compared to 66.97% of participants at T2. Participants reported a significant decrease in willingness to use the Devices for memory strategy from T1 to T2.

Table 18

Paired T-test on the Difference Between T1 and T2 in Willingness to Use Be PREPARED Strategies

		n	*M*	*SD*	*SEM*	*t*	*df*	*p*
Prioritize	T1	110	3.03	0.85	0.08	-1.64	109	.104
	T2		2.87	0.93	0.09			
Reading Strategy	T1	101	2.46	0.82	0.08	-1.86	100	.066
	T2		2.27	0.96	0.10			
Pomodoro	T1	91	2.31	0.99	0.10	-2.30	90	.024
	T2		2.02	0.93	0.10			
Good Study Space	T1	107	3.14	0.93	0.09	-1.50	106	.148
	T2		2.99	0.99	0.10			
Release	T1	101	2.89	0.85	0.08	-3.77	100	.000
	T2		2.45	0.97	0.10			
Devices for memory	T1	99	2.51	0.98	0.10	-3.93	98	.000
	T2		2.09	0.99	0.10			

Chapter 4. Discussion and Implications

The present study compared the effectiveness of StressOFF to an active control program, a single-session study skills program, Be PREPARED. Specific objectives were to report (a) students' prior experiences with stress management (e.g., knowledge and use of stress management pre-program); (b) students' perceived stress, mindfulness and test anxiety levels pre-program and at one-month follow-up; (c) students' perceptions of amount learned, level of difficulty of program, overall program rating, recommendation to a friend immediately post-program and at one-month follow-up; and (d) students' understanding and willingness to use strategies immediately post-program and at one-month follow-up.

The first aim of the study was to report students' prior experience with stress management. Students were asked to rate their knowledge of stress and stress management, their interest in knowing about stress and stress management, whether they had been taught stress management techniques, and if students used stress management techniques. They were also asked to report the frequency in which they used stress management techniques, their perceived ability to manage stress, and to identify specific stress management strategies used. Overall, as hypothesized, students in the StressOFF and Be PREPARED groups provided similar reports of their prior experience with stress management. In both groups, students reported limited knowledge of stress and stress management, and moderate interest in learning about stress and stress management. These findings are consistent with a previous study evaluating the feasibility and acceptability of StressOFF that demonstrated while students report limited prior knowledge of stress and stress management, they are also open to receiving instruction in this area (Shapiro et al., 2016). These findings are also consistent with a report generated by the APA (2014), which surveyed over 3000 adults and adolescents about their attitudes related to stress and stress

management. Interestingly, a greater portion of adolescents than adults reported being receptive to support for stress management (43 percent vs. 33 percent). Yet, only five percent of adolescents surveyed reported that they have sought professional support for stress management. To address the needs that have not been met by external mental health services, mental health initiatives targeting adolescents, including stress management programs, have been increasingly implemented in the school setting (Fazel, Hoagwood, Stephan, & Ford, 2014). However, students still report limited knowledge of stress and stress management. In the current study, approximately half of participants (54.50% in the StressOFF group; 44.20% in the Be PREPARED group) indicated that they had never been taught stress management techniques. Students' limited knowledge of stress and stress management may be related to insufficient exposure to stress management programs due to the significant time requirements of currently available programs, which may be rejected by school personnel (Bishop et al., 2006; Dusenbury et al., 2003). Instead, students report using self-taught stress management strategies. In the current study, the majority of students surveyed reported using self-taught stress management techniques at a moderate frequency and perceived their ability to handle their stress as "somewhat good" to "pretty good," mainly using distraction (e.g., reading, listening to music, watching TV) to cope with their stress. This finding is consistent with Shapiro and colleagues (2016) who found that prior to participating in a stress management program, students reported a lack of previous stress management instruction and indicated moderate frequency of use of general or self-taught stress management strategies, with distraction identified as the most commonly used strategy. Although students are implementing distraction and find it to be effective, the research on the effectiveness of distraction as a stress management strategy has yielded inconsistent findings (e.g., Gonzales, Tein, Sandler, & Friedman, 2001; Grant et al.,

2000; Hinds & Martin, 1988; Tolan, Gorman-Smith, Henry, Chung, & Hunt, 2002; Weisenberg, Schwarzwald, Waysman, Solomon, & Klingman, 1993). Its association with both positive and negative mental health outcomes may result from the context in which the distraction strategy is employed. For example, Woltgast and Lundh (2017) found that when distraction was used in the context of an accepting attitude, it was adaptive while the opposite was true when the strategy was used in combination with an attitude of avoidance. In some treatment protocols, such as dialectical behavior therapy (DBT; Linehan, 1993), which is a highly structured therapy that merges methods from CBT and mindfulness with a particular emphasis on emotion regulation, distraction is taught to help individuals tolerate distress (Ivanoff, Linehan, & Brown, 2001). However, as noted by Woltgast and Lundh (2017), DBT frames the use of distraction in a context which emphasizes acceptance and willingness. Accordingly, distraction is taught as a strategy to help individuals temporarily redirect their attention, or postpone their reaction, rather than to completely avoid aversive affect or difficult situations.

Given that coping capabilities diminish in adolescence (Hampel & Petermann, 2005; 2006), it is possible that even though adolescents perceive the use of the distraction strategy as effective in the current study, they may be using the strategy in a way that encourages avoidance. It is thus critical to teach effective coping strategies to equip adolescents with the necessary skills to protect against the effects of stress while promoting adaptive coping during this critical developmental period (Frydenberg & Lewis, 2000).

The second aim of the study was to assess students' change in perceived stress, mindfulness, and test anxiety levels from pre-program to one-month follow-up. As hypothesized, students in the StressOFF group reported significantly decreased perceived stress, increased mindfulness, and decreased test anxiety from pre-program to one-month follow-up.

Although school-based stress management programs, which typically consist of six to 12 weekly sessions of 40 to 50 minutes, have also been found to improve mental health outcomes in students (e.g., Hampel et al., 2008; Huppert & Johnson, 2010; Metz et al., 2013), this is the first study to demonstrate that a single-session stress management program may improve mental health outcomes in students over time. Contrary to the hypothesis, students in the Be PREPARED group also reported significantly decreased perceived stress, increased mindfulness, and decreased test anxiety from pre-program to one-month follow-up. This finding is inconsistent with results from previous program evaluations, which have found that the active control group used for comparison had no change or demonstrated an opposite effect to the treatment group (e.g., Sibinga et al., 2013). A possible explanation for this finding is likely the nature of the active control program and some of its commonalities with the treatment program. Specifically, in an effort to create a parallel active control, which is an appropriate comparison group (e.g., Langberg et al., 2008), the Be PREPARED program included similar components to StressOFF: psychoeducation, stigma reduction, coping strategies, and follow-up (pamphlet and online resources). The programs differed in the specific coping strategies presented, which were CBT and mindfulness based in StressOFF and study skills based in Be PREPARED. In both programs, the first portion was designated for psychoeducation and stigma reduction. In this portion, students were taught about stress and its adaptive and maladaptive components with images and animations. An interactive diagram demonstrated how stress can manifest itself cognitively, physiologically, and behaviorally. Also, celebrity examples were carefully selected to demonstrate real-world scenarios of cognitive, physiological, and behavioral manifestations of stress. Encouragingly, both StressOFF and Be PREPARED programs improved mental health outcomes in students after a one month period, which suggests that a stress management program

that implements psychoeducation and stigma reduction components in a single-session format has merit.

The third aim of the study was to report students' perceptions of amount learned, level of difficulty of program, overall program rating, and recommendation to a friend at immediate post-program and one-month follow-up. As hypothesized, students in the StressOFF group reported a significantly greater amount learned than students in the Be PREPARED group at immediate post-program and one-month follow-up. Although StressOFF and Be PREPARED contain similar content, the strategies in the programs differ with respect to the strategies included in the programs; StressOFF includes CBT and mindfulness based strategies whereas Be PREPARED implements study skills based strategies. A possible explanation for this difference may be that due to the relative newness of mental health preventive intervention programs within the school setting (Fazel et al., 2014), and in particular, mindfulness-based programs (Roeser, 2014), students perceive the strategies presented in StressOFF as more novel compared to Be PREPARED strategies, which are study-skills based and often embedded into regular classroom instruction by their teachers (Kiewra, 2002; Pressley & Woloshyn, 1995).

In addition to their perception of amount learned, students were asked to report their perception of program difficulty. In contrast to our expectations, StressOFF was not perceived as more difficult by students than Be PREPARED. Students in the StressOFF and Be PREPARED groups reported a comparable level of program difficulty at immediate post-program and one-month follow-up; in both groups, the majority of students rated the program as "just right." The importance of including developmentally appropriate content for optimal learning has been emphasized as critical in CBT (e.g., Sauter et al., 2009) and mindfulness approaches (e.g., Zelazo & Lyons, 2012). Comparable reports of program difficulty as "just

right" suggest that the content selected for StressOFF and Be PREPARED is in fact developmentally appropriate, an important criterion for program effectiveness (Broderick & Metz, 2016; Rones & Hoagwood, 2000).

Students were also asked to report program satisfaction. As hypothesized, students in the StressOFF group reported a greater overall program rating than students in the Be PREPARED group at immediate post-program and one-month follow-up. It is possible that the more novel strategies taught in StressOFF accounted for students' greater program satisfaction. Another possibility is that students may perceive the CBT and mindfulness based strategies in StressOFF as more helpful in targeting the immediate experience of stress, such as when the negative thoughts and overwhelming feelings arise. For example, if a student feels stressed during an exam, he or she may opt to use one of the StressOFF strategies, such as muscle relaxation, which has been shown to help induce a state of relaxation (e.g., Lohaus, & Klein-Heßling, 2000), thereby allowing the student to feel the effects of the strategy right away. In contrast, students may perceive the benefits of the Be PREPARED as more useful in preparation for the test or when the need for stress management is not as immediate.

Despite higher program ratings of StressOFF, students in the StressOFF and Be PREPARED groups provided comparable reports of recommendation to a friend at immediate post-program and one-month follow-up; in both groups, the majority of students reported that they will "probably" to "definitely" recommend the program. It is possible that students recommended the programs equivalently because they perceive a need for stress management instruction and with the scarcity of such instruction in the schools, they believe others will benefit from either of the stress management programs offered to them.

Regarding the anticipated maintenance of ratings of perceptions of amount learned, level of difficulty of program, program rating, and recommendation to a friend from immediate post-program to one-month follow-up, this hypothesis was not supported as students' ratings decreased in both the StressOFF and Be PREPARED groups. One possible explanation for this decrease is a common issue in survey research, known as telescoping, which often occurs when participants report past events (Gaskell, Wright, & O'Muircheartaigh, 2000). When telescoping, or compressing time, participants' perception of past events changes as a function as to the nearness or distance of the event in question, leading them to over report recent events and under report distant ones (Neuman, 2014). It is possible that participants in the StressOFF and Be PREPARED groups under reported their program response due to the one-month period that had elapsed between the program and the follow-up assessment, thus resulting in significant decreases in perceptions of amount learned, level of difficulty of program, program rating, and recommendation to a friend from immediate post-program to follow-up. It is also possible that without follow-up or explicit opportunities to use strategies, participants' program response may have decreased from immediate post-program to follow-up.

The fourth aim of the study was to report students' understanding and willingness to use strategies immediately post-program and at one-month follow-up. As hypothesized, participants in the StressOFF group reported high levels of understanding of all strategies (Stop Thought, Relaxation, Spotlight, Self-care and better choices) at immediate post-program. This finding is consistent with the pilot evaluation of StressOFF, which found that students reported high levels of understanding of the strategies immediately following participation in the program (Shapiro et al., 2016). In the current study, students were also asked to report their level of understanding of the strategies at one-month follow-up. Unexpectedly, StressOFF participants reported

significantly less understanding of strategies at one-month follow-up. Although participants were provided with pamphlets describing strategies and providing instructions as follow-up to the program, it was not documented if they used them. These results suggest that when the strategies are fresh in students' minds, they are more likely to report a solid understanding of them. However, over time, it appears that students' understanding of the strategies decreases. It is possible that the use of pamphlets as follow-up to this type of program is not sufficient. It could be that pamphlets need to be supplemented with teacher or school mental health professional support or even replaced by technology that is relevant to this age group, so that students can access follow-up resources by way of a mobile phone application or website; however, further research is needed to substantiate this possibility.

Further, as hypothesized, participants in the StressOFF group reported high levels of willingness to use the Relaxation and Self-care and better choices strategy and moderate willingness to use the Stop Thought and Spotlight strategy at immediate post-program. This finding is consistent with the pilot evaluation of StressOFF, which found that students reported moderate to high levels of willingness to use strategies immediately following participation in the program (Shapiro et al., 2016). In the current study, students were also asked to report their level of willingness to use the strategies at one-month follow-up. Contrary to the hypothesis, StressOFF participants reported significantly less willingness to use strategies at one-month follow-up. As indicated earlier, participants were provided with pamphlets describing strategies as follow-up to the program; these pamphlets were also meant to encourage regular practice after participating in program. The importance of practice of stress management strategies has been strongly supported in the literature (e.g., Huppert & Johnson, 2010). A possible explanation is that students did not engage in regular practice, which subsequently influenced their reports of

willingness to use strategies at one-month follow-up. Alternatively, students may have indeed practiced the strategies and discovered that they did not like them as much as they thought they would, or they may have found them difficult to use.

As hypothesized, participants in the Be PREPARED group reported high levels of understanding of all strategies (Prioritize, Reading strategies, Pomodoro, A good study space, Release, Devices for memory) at immediate post-program. However, contrary to the hypothesis, Be PREPARED participants reported significantly less understanding of strategies at one-month follow-up despite being provided with pamphlets describing them. As seen with StressOFF, it appears that students understand the strategies well immediately after they are taught, but over time, their reported understanding of the strategies decreases. These results shed light on the possibility that students may require teacher and mental health professional support in addition to an information pamphlet for follow-up to reinforce understanding of the strategies learned over time. Alternatively, since the usefulness of the pamphlets was not entirely clear in this study, it is possible that students may benefit from a different type of follow-up altogether, perhaps one that is more relevant to this age group, such as follow-up by way of mobile phone application or website; however, further research is needed to validate this claim.

Furthermore, as hypothesized, participants in the Be PREPARED group reported high willingness to use the Prioritize, Reading, A good study space, and Release strategies and moderate willingness to use Pomodoro and Devices for memory strategies at immediate post-program. Unexpectedly, Be PREPARED participants reported significantly less willingness to use Pomodoro, Release, and Devices for memory strategies at one-month follow-up; however, their reported willingness to use Prioritize, Reading, and A good study spaces strategies was unchanged. As indicated earlier, participants were provided with pamphlets describing strategies

as follow-up to the program; these pamphlets were also meant to encourage regular practice after participating in program. It is believed that students did not engage in regular practice as it was not a program requirement, which subsequently influenced their reports of willingness to use Pomodoro, Release and Devices for memory strategies at one-month follow-up. It is possible that these strategies are more complex and require more guidance to use whereas participants may engage in regular use of Prioritize, Reading and a Good study space strategies, or these strategies are consciously embedded within the school curriculum and taught as effective study skills.

In summary, results provide encouraging support for the implementation of a single-session stress management program in the schools. Students appear to respond more favorably to the strategies presented in StressOFF; however, comparable effectiveness of StressOFF and Be PREPARED in improving students' mental health outcomes over time suggest that students may benefit the most from the psychoeducation and stigma reduction components shared by the programs. Nevertheless, students did respond positively to the programs' strategy component, with students in both StressOFF and Be PREPARED demonstrating high levels of understanding and willingness to use the strategies immediately following participation in the programs. However, over time, in both groups, students' understanding and willingness to use strategies generally decreased, as did their program response, suggesting that students may require supplemental follow-up to the programs to sustain understanding, willingness to use strategies, and program response, perhaps in the form of ongoing teacher or mental health professional support, or by way of technology that is more relevant to this age group, such as access to a follow-up smart phone application or website.

Implications for School Mental Health Professionals

School mental health professionals will likely benefit from an understanding of the results to be better able to implement effective adolescent-targeted stress management programs in the schools. Students are generally reporting limited knowledge of stress and stress management and limited prior exposure to stress management instruction, yet they are also interested in receiving this type of instruction. Interest in the topic of a school-based program can favorably influence its outcome (e.g., Xiang, Chen, & Bruene, 2005). Indeed, students are interested in learning about stress and stress management, which bodes well for the implementation of the subject in a school-based preventive intervention program, but schools must also contend with limited time and resources, which may affect their application (Bishop et al., 2006; Dusenbury, et al., 2003; Fridrici & Lohaus, 2009). To increase feasibility of the application of these programs in the school settings, the implementation of briefer preventive intervention programs, such as single-session programs, has been recommended (Schmidt et al., 2007). Up until now, little was known about the effectiveness of single-session programs in the context of school-based stress management; although, there was some evidence that single-session programs could be effective in school-based settings for alcohol and drug prevention (e.g., Dempster et al., 2006) and reducing stigma around mental illness (e.g., Ke et al., 2015). The present findings are the first to demonstrate that a single-session stress management program has the potential to be effective in reducing perceived stress, test anxiety, and increasing mindfulness, even one month after the program. These results are very encouraging to school mental health professionals and clearly indicates a need for such programs in the school setting. Certainly, it is possible, with students reporting limited knowledge of stress and stress management and limited prior exposure to stress management instruction, that any stress

management instruction is perceived as so necessary that in the present study both StressOFF and Be PREPARED were found to have a significant effect.

With respect to program approach, comparable findings of the two programs suggests that a combined CBT and mindfulness program is not necessarily more effective than a study skills based program; however, these findings also imply that students may be responding to the shared components of StressOFF and Be PREPARED. That is, they may be responding to the elements of psychoeducation and stigma reduction present in both programs. Therefore, information about stress and normalizing the experience of difficulty handling it may be the most beneficial components of a stress management program for students. Yet, students who received the StressOFF program reported learning more than students in the Be PREPARED group and rated the program higher. This not only implies that students respond favorably to CBT and mindfulness based strategies, but they may also prefer these strategies and learn more from them than study skills. Still, there is a very clear need to implement stress management programs of any kind in the school setting. Their comparable recommendations of StressOFF and Be PREPARED to a friend ("probably recommend" to "definitely recommend") suggest that students think their peers would likely benefit from any stress management program, perhaps because there are so few currently available. However, when implementing stress management programs, it is important for school mental health professionals to consider the nature of the content included in such programs. For example, it has been recommended to include developmentally appropriate content to achieve optimal student learning (e.g., Sauter et al., 2009; Zelazo & Lyons, 2012) and for program effectiveness (Broderick & Metz, 2016; Rones & Hoagwood, 2000). Students' perceptions of StressOFF and Be PREPARED as equivalent with respect to program difficulty ("just right") suggest that the content selected for StressOFF and Be

PREPARED is indeed developmentally appropriate. This finding implies that students will respond positively to a stress management program that includes relevant and developmentally appropriate content regardless of its approach as CBT and mindfulness or study skills based.

Over time, however, despite continued reported mental health benefits, students' program ratings of StressOFF and Be PREPARED, including amount learned, level of difficulty of program, program rating, and recommendation to a friend decreased. This decrease is also true for students' understanding and willingness to use strategies, suggesting a potential need for supplemental follow-up to the programs. There is research demonstrating that school-based stress management programs are successful when classroom teachers are involved in program delivery (Frydenberg et al., 2004; Hampel et al., 2008). It is possible that by embedding strategies on an ongoing basis into the classroom activities, teachers may facilitate students' retention and regular application of these strategies, thus maintaining their levels of program response, understanding, and willingness to use strategies over time. It is also possible, given the unclear benefits of the pamphlets provided, that students might benefit from some other form of follow-up, perhaps one that is more relevant to this age group, such as access to a mobile phone application or website that builds on the content provided in the stress management program.

In summary, the current research identifies a clear need for school-based mental health programs that are both time-efficient and effective. In particular, a brief stress management program that includes relevant and developmentally appropriate content can help reduce stress, test anxiety, and increase mindfulness even one month after delivery. Still, students' decreased program evaluation at follow-up suggest that a brief program on its own may not be sufficient. To maximize program effectiveness, including school personnel in program delivery is

recommended, so program material and strategies can be implemented with students in an ongoing way.

Limitations and Directions for Future Research

The present study is not without its limitations. First, it is important to note that there are possible contextual issues, which may have influenced the study's outcomes. For example, StressOFF and Be PREPARED were run in schools whose administration and classroom teachers were very receptive to bringing in external stress management programs. Future research should take into consideration variability in school administration and teacher support for such programs. Future research should also take into account other contextual factors, going beyond an exclusive focus within the individual when examining stress. For example, it would be important to consider stressors that exist in some students' day-to-day life, which reflect societal inequities and barriers due to institutionalized racism.

Second, the active control condition was not ideal. According to the literature, the active control condition should mirror the treatment condition without including its active ingredient (Kirsch, 2005). In the current study, the treatment and active control conditions contained very similar content with respect to psychoeducation, yet differed with respect to the approach of the strategies used. It is possible that the active ingredient in the programs was in fact the psychoeducation and stigma reduction elements. To evaluate whether a combined CBT and mindfulness approach is more effective than a study skills based approach, future research should compare StressOFF to an active control group that is less similar in content to the treatment group. Also, it may be beneficial to include a passive control group (waitlist) as a third comparison group to ensure that improvements in mental health outcomes in the treatment group are not solely due to the passage of time.

Third, participants were not asked to report their actual use of the strategies taught after one-month, but rather they were asked to report their willingness to use strategies. Future research should include reports of actual use of strategies taught rather than potential use. These reports may provide a better indication if students are indeed using the strategies at follow-up.

Fourth, students in the StressOFF group reported a greater amount learned than students in the Be PREPARED group following participation in the program. This finding was based on students' perceived knowledge gains; however, their actual knowledge gains were not measured. Future research should assess students' mental health knowledge pre- and post-program using surveys matching program content to provide a more accurate depiction of students' knowledge gains following program participation.

Fifth, randomization to treatment and control groups occurred by class and not by individual students. In the school setting, since students are already grouped by class, randomization by class was a decision made to accommodate the schools by simplifying the coordination of program delivery and data collection. Future research should attempt to employ randomization by individual student as there is a chance that the classroom as an already existing unit could pose an issue with respect to representation (Krathwohl, 2009).

Finally, the sample of participants represents a restricted demographic as the schools involved were classified as middle to high SES. Future research should explore the influence of additional variables on program effectiveness.

Summary

Stress is a prevalent issue among adolescents (APA, 2014) and a risk factor for various mental disorders (Auerbach et al., 2011; Byrne et al., 2007; Rudolph, 2002; Waaktaar et al., 2004), signaling a need for stress management programs targeting adolescents (Foret et al.,

2012). The school represents an appropriate setting to implement such programs (Lock & Barrett, 2003); however, existing programs are lengthy, which may lead to their rejection by schools (Bishop et al., 2006; Dusenbury et al., 2003). Consequently, students are reporting limited prior knowledge of stress and stress management and a lack of stress management instruction (Shapiro et al., 2016). StressOFF was created to maximize feasibility of program implementation in the schools by combining the elements of existing evidence-based stress management programs and condensing them into a single-session program. Comparable effectiveness of StressOFF to the active control program Be PREPARED, suggests that a single-session stress management program can improve students' mental health outcomes over time. Specifically, students may benefit most from the components of psychoeducation and stigma reduction shared by both programs; however, there is indication that students prefer StressOFF and report learning more than students who participated in the Be PREPARED program. Interestingly, despite self-reported benefits in stress, test anxiety, and mindfulness over a one-month follow-up period, students in both groups reported decreased ratings of program and strategies over that time, suggesting a possible need for ongoing strategy and program reinforcement. Findings from the current dissertation provide encouraging support for the implementation of a single-session stress management program in the schools; although, to ensure maintenance of strategy use, ongoing follow-up is recommended.

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N.B. In all documentation provided to schools, participants were informed that they were to fill out questionnaires at four time points. In the current study, only data from pre-program and immediate post-program (T1) and one-month follow-up (Time 3) were included to ensure an adequate sample size due to participant attrition from T1 to Time 4 (in the current study, Time 3 was renamed as T2). Participants were also informed that they would have the opportunity to participate in focus groups. Because of timing issues (e.g., end of year exams), schools did not agree to participate in this component of the project. The sections that have been omitted in the present study are highlighted.

Appendix A

Letter to Schools Explaining Research

Dear Administrators, Teachers, School Psychologists and/or Guidance Counselors,

As part of our research on mental health program development, we would like to offer two stress management programs to the Grade 9 to 11 students at your school.

StressOFF Strategies+ and **Be PREPARED** are **single-session** (1 classroom period) stress management workshops designed to promote awareness of the effects of stress on our thinking, bodies and behaviors.

In the **StressOFF Strategies+** workshop, students will learn about strategies, such as thought challenging, relaxation, mindfulness, and making better choices to manage stress, which help manage the psychological, physical and behavioral effects of stress. **Be PREPARED** will have the same components as StressOFF Strategies+; however, there will be more of a focus on study skills (i.e., organization, time management). After the workshops, all students will be provided with either a StressOFF or Be PREPARED Pamphlet, which outlines the strategies and explains how to use them on a daily basis.

Both **StressOFF Strategies+** and **Be PREPARED** are **75 minutes** in length, including the time allotted for students to fill out brief questionnaires (Total: 15 minutes), immediately before and after the workshop. A McGill graduate student will administer and collect the questionnaires. These questionnaires will provide insight into whether or not a brief workshop can improve students' stress, understanding of stress and willingness to use stress management strategies. Students will fill out the questionnaires at 3 additional time periods (2 weeks, 1 month and 2 months after initial program delivery). The approximate time to fill out questionnaires is 15 minutes. A selected number of students will also have the opportunity to participate in groups with the research team in order to further discuss feedback upon participating in the program.

PLEASE NOTE: While all students in participating classes will be attending the stress management workshop as part of the agreed upon curriculum and will be filling out questionnaires that are *part* of the program (ex. for the student's information only), student assent and parent/legal guardian's consent is required for students to fill out additional questionnaires for *research and program improvement.*

Attached you will find a **TEACHER SCRIPT**, **STUDENT ASSENT** and **PARENT**

CONSENT form. We are kindly asking if you can please read the **TEACHER SCRIPT** form out loud to students in class or another time that is convenient. This script provides key information about the workshop, questionnaires and consent forms.

We also ask that you have students bring home the **STUDENT ASSENT** and **PARENT CONSENT** to read and sign. **If students wish to have their questionnaires used for research, it is extremely important that we receive filled out and signed STUDENT ASSENT AND PARENT CONSENT forms when our team arrives to your school.**

If you have any questions or concerns, please do not hesitate to contact us at the coordinates below.

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Appendix B

Oral Script to be Read to Students

On _____ your class will participate in a **45-minute** stress management workshop *during class time*. Adolescence is a period in which many changes are happening (different friends, greater school demands, etc.). These changes can often bring about stress, so in this workshop, you will learn strategies that will help you better manage and reduce the stress that comes with being a teenager. The team that is delivering the workshop would like to have your feedback, so they are inviting you to fill out **brief questionnaires (15 minutes total)**. These will be filled out immediately before and after the workshop, and again, 2 weeks, 1 month and 2 months after the workshop. You will also have the opportunity to participate in groups with the research team in order to further discuss feedback upon participating in the program.

While all students in participating classes will be attending the stress management workshop as part of the agreed upon curriculum and will be filling out questionnaires that are *part* of the program (ex. for the student's information only), your permission AND your parent or legal guardian's permission is required for you to fill out additional questionnaires for *research and program improvement*.

If you agree to fill out the questionnaires for *research and program improvement*, please complete your information, and return both the **STUDENT ASSENT AND PARENT CONSENT** forms to school. We ask that you check the box that says YES.

If you do not fill out the student assent AND parent consent forms, you will participate in the stress management workshop, but you will only fill out the questionnaires that are *part* of the program. Your questionnaires will then be destroyed.

Please bring back these forms by _____.

Thank you!

Appendix C
Student Informed Consent

RESEARCH PROJECT
Stress Program 2016

Dear Parent/Legal Tutor,

Adolescence is a period characterized by physical, social and emotional changes. These changes can often produce significant stressors, including interpersonal stress (e.g., difficulties with peers or family members), intrapersonal distress (e.g., anxiety, mood, self-esteem), and generalized school stress (e.g., homework stress, test anxiety). While stress reductions programs may offset the negative effects of stress, they are often lengthy and therefore difficult to implement in a school setting where time is limited and reserved for curricular activities.

Our research team is interested in evaluating the effectiveness of a *single-session* (1 classroom period) stress management workshop for students with brief (5 minute) follow-up activities that are embedded into the curriculum. In this program, students will learn how to effectively manage stress through various techniques. Results from this study will contribute to our greater understanding of how adolescents make sense of and cope with stress, and will determine if students' stress levels are affected after participating in a brief stress management workshop.

Project activities: As a part of the agreed upon curriculum, students will be randomly assigned to either the StressOFF Strategies+ or Be PREPARED stress management workshop. The workshop will be **45 minutes in length** and will be delivered during class time. The session will consist of information pertaining to stress management and learning various teen-friendly techniques to help with stress management. In order to evaluate the effectiveness of the workshop, students will be asked to participate in a 5-minute needs assessment, which will measure students' current stress level, their knowledge of stress and use of coping techniques. Students will complete other measures, which will assess their stress, mindfulness and test anxiety (total 15 mins). Students will complete these measures again immediately following the program, 2 weeks, 1 month and 2 months following the program. A McGill graduate student will administer all questionnaires during class time. Students will also have the opportunity to participate in focus groups with a graduate student in order to further discuss feedback upon participating in one of the programs. Participation in these groups is voluntary and will require a separate consent form, which will be provided at a later date.

Benefits: Youth are reporting increased levels of stress and difficulty managing stress. This project has the potential to greatly enhance our understanding of adolescent stress management and the components that are requisite to build a single-session, yet effective, stress reduction program at the school level.

Potential risks: While there are no direct risks involved in participation in this research project, some participants may feel as though they require further support for stress management after the workshop. All students will be provided with a list of suggested literature and links to online resources for stress management. The school mental health professional will also be aware of the program and will be prepared to do follow-up with participants who need extra support.

All information collected will be kept confidential, and all completed questionnaires will be kept in a locked cabinet accessible only to the primary researcher from McGill University. All data will be coded to ensure confidentiality. No identifying information will be used in any written or oral presentation of the results. Students are free to withdraw from the project at any time.

PLEASE NOTE: While all students in participating classes will be attending the stress management workshop as part of the agreed upon curriculum and will be filling out questionnaires that are *part* of the program (ex. for the student's information only), parent/legal guardian's consent is required for students to fill out additional questionnaires for *research and program improvement.*

Please check the "YES" box and sign the attached form if you would like your son/daughter's questionnaires to be used for research and program improvement, and return the attached form to school by _____. Should you have any questions, please feel free to contact me at the coordinates listed below.
If you have any questions or concerns about your son/daughter's rights or welfare as a participant in this research study, please contact the McGill Research Ethics Officer (Lynda McNeil) at (514) 398-6831 or lynda.mcneil@mcgill.ca. Thank you!

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❑ **YES** ⇢ I consent to my son/daughter's participation in this project.

Signature: _____ Date: _____

Name of **parent/legal tutor** (please print): _____

Name of **student** (please print): _____

Student's date of birth (month/day/year): _____

Parent telephone number(s): _____

Appendix D

Student Assent to Participate in Project

Dear Student,

- Your grade will be participating in a **45-minute stress management workshop on _____.** In this workshop, you are going to learn about different ways to deal with stress. Adolescence is a time where many changes are happening (different friends, greater school demands, etc.). These changes can often bring about stress, so in this workshop, you will learn strategies that will help you better manage and reduce the stress that comes with being a teenager!

- We would really like to have your feedback on the workshop, so we are inviting you to fill out some brief questionnaires (approximately 15 mins), which will be given by a McGill graduate student. These will be filled out immediately before and after the workshop, 2 weeks, 1 month and 2 months after the workshop. The questionnaires will ask you about how stressed you feel on a day-to-day basis and will ask you about how you deal with stress. We will also ask you if you have learned any new ways of dealing with stress after participating in the workshop. Finally, you will have the opportunity to express whether or not you think the program is useful.

- You will be asked to fill out the questionnaires in school, during class time.

- All of the answers you give in these questionnaires are completely confidential. Neither your teachers nor your parents will be told about your answers on the questionnaires.

- No identifying information about you will be used in any presentation of the results from this project.

- Your classroom work and grades will not be affected by your decision to participate or not to participate.

- This project has the potential to enhance our understanding of adolescent stress management and the components that are required to build an effective stress reduction program at the school level. While there are no direct risks involved in participation in this project, you may feel as though you require further support for stress management after the workshop. You will be given a list of resources for stress management and your school mental health professional will be informed of the program should you wish to approach him or her.

- *Please be assured that you do not have to answer any question on the questionnaire you don't want to, and you can take a break or end a session at any time, or withdraw from the study at any time.*

Please note: While all students in participating classes will be attending the stress management workshop as part of the agreed upon curriculum and will be filling out

questionnaires that are *part* of the program (ex. for the student's information only), your permission AND your parent or legal guardian's permission is required for you to fill out additional questionnaires for *research and program improvement*.

If you agree to fill out the questionnaires for *research and program improvement*, please complete your information, and return the attached form to school. We ask that you check the box that says YES.

If you do not fill out this form, you will participate in the stress management workshop, but you will only fill out the questionnaires that are *part* of the program. Your questionnaires will then be destroyed.

If you have any questions or concerns about your rights or welfare as a participant in this research study, please contact the McGill Research Ethics Officer (Lynda McNeil) at (514) 398-6831 or lynda.mcneil@mcgill.ca.

Thank you,

Amy Shapiro, MEd
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Nancy L. Heath, PhD
Supervisor
T : (514) 398-3439 E : nancy.heath@mcgill.ca

YES: ⇢ I agree for my questionnaires to be used for research and program improvement

Name (please print):

_____

Signature:

_____

Date:

_____

Appendix E

Students' Prior Experiences with Stress Management Questionnaire

Date of birth (mm/dd/yyyy): _____/_____/_____

Gender (*Circle*): **M** **F**

1. What do you know about stress and stress management?

0	1	2	3
Nothing at all	A bit	Quite a bit	A lot

2. How interested are you in knowing about stress and stress management?

0	1	2	3
Not at all interested	A bit interested	Quite interested	Very interested

3. a) Have you ever been taught or shown stress management techniques?

□ Yes
□ No

b) If yes, specify where:

---

4. Do you use stress management techniques?

□ Yes
□ No

5. Which stress management techniques do you use?

- □ Deep Breathing
- □ Guided relaxation exercises
- □ Meditation
- □ General mindfulness techniques
- □ Yoga
- □ Talking to an adult
- □ Talking to a friend
- □ Positive self-talk
- □ Exercise
- □ Taking a walk
- □ Distraction (ie. reading, listening to music, watching TV or a movie)
- □ Others: _____
- □ None

6. How often do you use stress management techniques?

0	1	2	3
Never	Almost never	Sometimes	Very Often

7. How good are you at managing your stress?

0	1	2	3
Not at all good	Somewhat good	Pretty good	Very Good

8. Have you ever visited an online stress management site?

- □ Yes
- □ No

9. If no, would you ever consider visiting an online stress management site?

- □ Yes
- □ Maybe
- □ No

Appendix F

Perceived Stress Scale - Adapted (PSS; Cohen et al., 1995)

Instructions: Respond to the questions below by circling **ONE** number per question.

0 = *Never* 1 = *Almost Never* 2 = *Sometimes* 3 = *Fairly Often* 4 = *Very Often*

In the last month, how often have you…	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. …been upset because of something that happened unexpectedly?	**0**	**1**	**2**	**3**	**4**
2. …felt that you were unable to control the important things in your life?	**0**	**1**	**2**	**3**	**4**
3. …felt nervous and "stressed"?	**0**	**1**	**2**	**3**	**4**
4. …questioned your ability to handle your personal problems?	**0**	**1**	**2**	**3**	**4**
5. …felt that things were just not working out for you?	**0**	**1**	**2**	**3**	**4**
6. …found that you could not cope with all the things that you had to do?	**0**	**1**	**2**	**3**	**4**
7. …felt unable to control irritations in your life?	**0**	**1**	**2**	**3**	**4**
8. …felt that you were overwhelmed by things?	**0**	**1**	**2**	**3**	**4**
9. …been angered because of things that were outside of your control?	**0**	**1**	**2**	**3**	**4**
10. …felt difficulties were piling up so high that you could not overcome them?	**0**	**1**	**2**	**3**	**4**

Appendix G

Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6

1 Almost Always	2 Very Frequently	3 Somewhat Frequently	4 Somewhat Infrequently	5 Very Infrequently	6 Almost Never

I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

Appendix H

Revised Test Anxiety Scale (RTAS; Benson & El-Zahhar, 1994)

The following items refer to how you feel when taking a test. Use the scale below to rate Items 1 through 25 in terms of how you feel when taking tests in **GENERAL.**

1 = *almost never* 2 = *sometimes* 3 = *often* 4 = *almost always*

1. Thinking about my grade in a course interferes with my work on tests……...1 2 3 4
2. I seem to defeat myself while taking important tests……....1 2 3 4
3. During tests I find myself thinking about the consequences of failing…….1 2 3 4
4. I start feeling very uneasy just before getting a test paper back……...1 2 3 4
5. During tests I feel very tense……....1 2 3 4
6. I worry a great deal before taking an important exam……..1 2 3 4
7. During tests I find myself thinking of things unrelated to the material being tested……...1 2 3 4
8. While taking tests, I find myself thinking how much brighter the other people are……..1 2 3 4
9. I think about current events during a test……..1 2 3 4
10. I get a headache during an important test…….....1 2 3 4
11. While taking a test, I often think about how difficult it is…….....1 2 3 4
12. I wish tests did not bother me so much……1 2 3 4
13. I am anxious about tests…….....1 2 3 4
14. Thoughts of doing poorly interfere with my concentration during tests……..1 2 3 4
15. While taking tests I sometimes think about being somewhere else……..1 2 3 4
16. During tests I find I am distracted by thoughts of upcoming events…….1 2 3 4
17. My mouth feels dry during a test……..1 2 3 4
18. I sometimes find myself trembling before or during tests…….....1 2 3 4

19. During the test I sometimes break into a “cold sweat”…….1 2 3 4

20. I feel nauseous during the test……...1 2 3 4

21. While taking a test my muscles are very tight……..1 2 3 4

22. I have difficulty breathing while taking a test……..1 2 3 4

23. When taking a test I’ll sometimes catch myself not paying attention to the questions…….1 2 3 4

24. During the test I think about how I should have prepared for the test…….....1 2 3 4

25. I worry before the test because I do not know what to expect……..1 2 3 4

Appendix I

Students' Response to Program Questionnaire (StressOFF)

1. Now, after participating in this stress management program, I feel I learned:

0	1	2	3
Nothing	A small amount	A medium amount	A lot

2. I feel the program was:

0	1	2	3
Not sure	Too simple	Just right	Too complicated

3. How well do you now understand the following strategies? ***(Circle one number for each strategy)***

STRATEGY	**1= Not Very Well**	**2 = Understand Quite Well**	**3 = Understand Very Well**
Stop, thought challenge	1	2	3
Relaxation	1	2	3
Spotlight	1	2	3
Self-care and better choices	1	2	3

4. In a stressful situation, how likely are you to use each strategy:

STRATEGY	**0 = Never: I don't need stress management**	**1 = Never: I don't like this technique**	**2 = Sometimes**	**3 = Fairly often**	**4 = Always**
Stop, thought challenge	0	1	2	3	4
Relaxation	0	1	2	3	4
Spotlight	0	1	2	3	4
Self-care and better choices	0	1	2	3	4

5. How would you rate the program overall?

1	2	3	4
Poor	Satisfactory	Good	Excellent

6. Would you recommend this program to a friend?

1	2	3	4
No, definitely won't	No, probably won't	Yes, probably will	Yes, definitely will

General comments on the program *(Optional)*

_____

_____

_____

Appendix J

Students' Response to Program Questionnaire (Be PREPARED)

1. Now, after participating in this stress management program, I feel I learned:

0	1	2	3
Nothing	A small amount	A medium amount	A lot

2. I feel the program was:

0	1	2	3
Not sure	Too simple	Just right	Too complicated

3. How well do you now understand the following strategies? ***(Circle one number for each strategy)***

STRATEGY	**1 = Not very Well**	**2 = Understand Quite Well**	**3 = Understand Very Well**
Prioritize	1	2	3
Reading strategies	1	2	3
Pomodoro technique	1	2	3
A good study space	1	2	3
Release	1	2	3
Devices (mnemonics)	1	2	3

4. In a stressful situation, how likely are you to use each strategy:

STRATEGY	**0 = Never: I don't need stress management**	**1 = Never: I don't like this technique**	**2 = Sometimes**	**3 = Fairly often**	**4 = Always**
Prioritize	0	1	2	3	4
Reading strategies	0	1	2	3	4
Pomodoro technique	0	1	2	3	4
A good study space	0	1	2	3	4
Release	0	1	2	3	4
Devices (mnemonics)	0	1	2	3	4

5. How would you rate the program overall?

1	2	3	4
Poor	Satisfactory	Good	Excellent

6. Would you recommend this program to a friend?

1	2	3	4
No, definitely won't	No, probably won't	Yes, probably will	Yes, definitely will

General comments on the program *(Optional)*

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