



## Integrating a relaxation response-based curriculum into a public high school in Massachusetts

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### A B S T R A C T

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Academic and societal pressures result in U.S. high school students feeling stressed. Stress management and relaxation interventions may help students increase resiliency to stress and overall well-being. The objectives of this study were to examine the feasibility (enrollment, participation and acceptability) and potential effectiveness (changes in perceived stress, anxiety, self-esteem, health-promoting behaviors, and locus of control) of a relaxation response (RR)-based curriculum integrated into the school day for high school students. The curriculum included didactic instruction, relaxation exercises, positive psychology, and cognitive restructuring. The intervention group showed significantly greater improvements in levels of perceived stress, state anxiety, and health-promoting behaviors when compared to the wait list control group. The intervention appeared most useful for girls in the intervention group. The results suggest that several modifications may increase the feasibility of using this potentially effective intervention in high schools.

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Stress is an unavoidable part of our daily lives, and the developmental challenges of adolescence often result in high school students feeling particularly stressed. In addition to the stress-inducing physical changes associated with puberty, psychological transformations also provide a significant challenge. For example, Erikson (1968) describes the main developmental task of adolescence as the formation of a personal identity and Levinson (1978) expresses the nature of changing relationships during this period; both can be stressful transition events in the lives of adolescents. At the same time that adolescents attempt to differentiate themselves from their parents, they work to obtain a desirable place in their peer arena. As a result, relational stressors with friendships, romantic relationships, and family are emergent and threatening (Frydenberg et al., 2004; Groer, Thomas, & Shoffner, 1992).

High school is also a time of increased academic and societal pressure. Adolescents are often starting to make choices for themselves and starting to think about the future. The need to perform academically is a major stressor for many students, particularly those desiring to attend college (de Anda et al., 2000; Frydenberg et al., 2004; Hardy, 2003; Ollfors & Andersson, 2007; Suldo, Shaunessy, & Hardesty, 2008). High school students also feel stressed about their futures (de Anda et al., 2000). Studies exploring the relationship between gender and stress in adolescents have found differing results. Some studies have found that stressors are different in nature for girls and boys, with girls exhibiting higher levels of perceived stress (Groer et al., 1992; Ollfors & Andersson, 2007), while other work has shown no gender differences (de Anda et al., 2000).

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The 2010 documentary, *Race to Nowhere*, depicts how students have “been pushed to the brink” and provides a haunting illustration of the high levels of stress that students currently face (<http://www.racetonowhere.com/about-film>). These myriad pressures on students today warrant interventions for stress reduction. If stressors are present in the absence of proper coping, students are vulnerable to increasingly alarming negative outcomes. Stress is documented to contribute to escalation of substance abuse (Wills, Vaccaro, McNamara, & Hirky, 1996), violence (Williams, Stiffman, & O’Nea, 1998), and depression (Stader & Hokanson, 1998) in adolescents. Even suicide is a possible, and irreversible, consequence of stressful life events in the absence of healthy coping (Beautrais, 2003).

To counteract the negative outcomes of perceived stress, students need a toolbox of positive coping mechanisms. Stress management and relaxation training may help students build resiliency against stress by decreasing perceived stress and anxiety, increasing self-esteem and promoting healthy behaviors. Other interventions such as cognitive restructuring can teach students to reframe unhealthy thought patterns. Although there is limited research on school stress management, some high school stress management programs used to reduce negative emotional outcomes have been studied. In particular, a variety of relaxation interventions (Kraag, Zeegers, Kok, Hosman, & Abu-Saad, 2006; Rased & Parish, 1998) have been shown to be effective in treating general anxiety (Kiselica, Baker, Thomas, & Reedy, 1994), test anxiety (Dendato & Diener, 1986; van der Ploeg-Stapert & van der Ploeg, 1986), and math anxiety (Sime, 1987). While effective, most studies have focused on anxiety (Neil & Christensen, 2009), or on youth with pre-existing conditions (Black, Milam, & Sussman, 2009), rather than using a primary prevention strategy to target stress.

The Benson-Henry Institute for Mind Body Medicine (BHI) at Massachusetts General Hospital (MGH) (formerly the Mind Body Medical Institute; MBMI) has provided trainings to students and teachers through its Education Initiative (EI) since 1989. The cornerstone of the BHI EI training is the elicitation of the relaxation response (RR), a physiological state that is understood to be the opposite of the fight-or-flight (stress) response (Benson, 1975). Nearly a century ago, Walter B. Cannon described the fight-or-flight (stress) response as a set of bodily changes that occur in response to stress (Cannon, 1939). Researchers studying the long-term effects of the fight-or-flight (stress) response have concluded that it may lead to permanent, harmful physiological changes (McEwen, 2007). Ongoing practice of the RR has been shown to counteract the hormonal changes brought on by stress (Hoffman et al., 1982). Acutely eliciting the RR leads to a decrease in respiratory rate, heart rate, oxygen consumption and blood pressure (Wallace, Benson, & Wilson, 1971). Examples of ways to elicit the RR include meditation, yoga, tai chi, and diaphragmatic breathing. Elicitation of the RR requires two components: a) the repetition of a word, sound, prayer, thought, phrase or muscular activity and b) the passive return to the repetition when everyday thoughts intrude (Benson, 1975).

Previous work at the BHI, including several research studies, has focused on teaching RR-based stress management skills to students. In a 1994 BHI EI study, high school students were exposed to either a RR-based curriculum which included education in stress management, or a control health education condition, each of which took place three times per week for a semester during health class (Benson et al., 1994). After exposure to the RR group, students showed a significant increase in self-esteem ( $p < .05$ ). In addition, the second group to receive the intervention also had a significant shift toward internal locus of control ( $p < .05$ ). Another study by the BHI introduced the RR into urban middle school classrooms by training teachers to teach RR skills to their students. Students who took three or more classes in which the teacher was trained in the RR had significantly higher GPAs, and demonstrated better work habits and more classroom cooperation than those with two or fewer exposures ( $p < .0001$ ) (Benson et al., 2000). In a third study, college students were exposed to six 90-min RR trainings. Significant reduction in psychological symptoms, state anxiety and perceived stress were found ( $p = .018, .001$  and  $.008$  respectively) (Deckro et al., 2002). A review of the BHI clinical programs found that RR interventions also improved health-promoting behaviors as measured by the Health-Promoting Life-style Profile-II (HPLP-II) ( $p < .001$ ) (Samuelson et al., 2010).

The current study investigates an 8-session curriculum in which EI trainers utilized a standardized protocol that was taught during physical education classes. Needham High’s participation in the intervention was prompted by several teen suicides and other tragedies that took place in the two years preceding the intervention; these events highlighted the need for a coping skills intervention at the high school. The school agreed to allow any 10th and 11th grade students who desired to participate to be excused from physical education classes.

The Needham study design was built upon, but was distinct from, previous research conducted at BHI. Previous EI work (Benson et al., 1994, 2000; Deckro et al., 2002) differed from the current study’s combination of target population and intervention design and delivery: it included different school age targets (i.e. middle school or college), different interventionist (i.e., teacher), different treatment-delivery duration (i.e., semester long), and adjunctive curriculum status (i.e. evenings after school). The current design was built based upon what was believed would be feasible and effective: a 4-week, EI interventionist-delivered treatment integrated into the high school students’ gym class schedule. The objective of this non-randomized cohort study was to examine the feasibility (recruitment and enrollment, participation, retention and completion, and acceptability and perceived value) and potential effectiveness of this RR-based curriculum while examining outcome variables of perceived stress, anxiety, self-esteem, health-promoting behaviors, and locus of control.

## Methods

### Participants

We mailed a letter to the parents of all 10th and 11th grade students (745 students) at Needham High School, inviting their children to participate. We obtained parental informed consent and student assent from fifty-four 10th graders (control

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