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Practicing Transcendental Meditation in High Schools: Relationship to Well-being and Academic Achievement Among Students

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Abstract The Quiet Time program provides a 15-min period at the beginning and end of the school day where students may practice Transcendental Meditation (TM) or another quiet activity such as reading silently to oneself. This study examined the impact of participating in Quiet Time on ninth-grade students (n=141) by comparing their outcomes to those of a group of ninth-grade students (n=53) attending a school that did not participate in Quiet Time. Students in both groups completed an assessment battery in early October 2012, shortly after which treatment students learned TM, and again in May 2013. Analysis of covariance was used to analyze the differences between the treatment and comparison groups. Results indicated that students who participated in Quiet Time scored significantly lower on anxiety (p<0.05) and higher on resilience (p<0.05) at follow-up than comparison group students. Within the treatment group, students who spent more time meditating also had higher resilience scores and higher instruction time. After participating in Quiet Time, students self-reported increases in their sleep, happiness, and self-confidence.

Keywords Quiet Time · Transcendental Meditation · Psychological well-being · Academic achievement · Anxiety

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The mental health and emotional well-being of young people is of concern worldwide (Blanco et al. 2008; Gore et al. 2011). Psychological distress, generally characterized by symptoms of anxiety, depression, and anger or hostility, has been linked to poor social functioning and day-to-day living (Bayram and Bilgel 2008), risky behaviors, and physical illness in students (Adams et al. 2008). Further, psychological distress has been identified as a precursor to more serious mental health disorders (Kessler et al. 2007). Students globally report significant levels of psychological distress (Dyrbye et al. 2006; Verger et al. 2009). A large body of research has shown that stress compromises cognitive functioning, behavior, and emotional and physical well-being (Kutash and Schlesinger 1980) and negatively impacts student learning. It has been found that in addition to community environmental and social stressors, school experiences can also be stressful (Lowry et al. 1999).

The fields of cognitive and behavioral neuroscience have clearly delineated the impact of brain functioning on thinking, emotion, and behavior (Laird et al. 2009). Research conducted over the past 40 years has demonstrated that the Transcendental Meditation (TM) technique, because of its effects on improving physiological functioning, has wide-ranging benefits. These include improved health (Paul-Labrador et al. 2006), decreased psychological distress (negative emotions) (Eppley et al. 1989; Nidich et al. 2009), increased social and emotional learning competencies, enhanced self-actualizing abilities (Alexander et al. 1991), increased intelligence and creativity (So and Orme-Johnson 2001), reduced substance abuse (Alexander and Rainforth 1994), and greater work productivity (Frew 1974). A program with the ability to significantly reduce stress and promote healthy brain functioning has important relevance to education, both as a means to achieve schools' primary aim of promoting learning and schools' more general aim of promoting healthy human development.

Initial research findings on TM for students have been very positive at multiple school levels. Research conducted at the secondary school level found significant reductions in psychological distress, including anxiety in students practicing the TM program compared to controls (Elder et al. 2014). At the middle school level, meditating students scored significantly higher than control students on the California Standards Tests (CSTs) in several content areas (Nidich et al. 2011). Other school research on the TM program has indicated higher graduation rates and lower school dropout rates (Colbert and Nidich 2013), reduced negative school behavior (Barnes et al. 2003), and improved physical health (Barnes et al. 2004). At the college level, a randomized controlled study found significant reductions in students' mood disturbance, anxiety, and depression and increases in emotional and behavioral coping ability for students practicing TM compared to students who were not using TM (Nidich et al. 2009). Finally, a recent meta-analysis (Orme-Johnson and Barnes 2013) indicated TM's positive effects on anxiety.

One program that is aimed at reducing stress and promoting healthy brain functioning is the Quiet Time program (https://www.davidlynchfoundation.org/schools.html). The Quiet Time program includes a twice-daily 15-min period where students engage in quiet activities, such as sustained silent reading or TM. The purpose of Quiet Time is to reduce stress, enhance health and well-being, and increase readiness to learn. Although not all students participate in TM during Quiet Time, all students are given the option of practicing TM during this time. The Quiet Time program offers TM because of the extensive body of research documenting the effectiveness of TM for reducing stress and improving mental health (Walton et al. 2004) and for positively impacting brain functioning by promoting higher frontal electroencephalographic (EEG) coherence and brain integration (e.g., Dillbeck et al. 1981; Travis 2002). TM has also been shown to increase executive functioning (e.g., Dillbeck 1982; Travis et al. 2011). The rationale underlying the Quiet Time program recognizes that student learning and behavior and teacher and administrator ability to teach and lead can be improved by enhancing neurophysiological functioning.

With the objective of decreasing psychological distress in students and improving student mental health outcomes, the Center for Wellness and Achievement in Education (CWAE) partnered with a large urban west coast school district to implement the Quiet Time program in several of the district's middle and high schools. The current research builds on the school district's experience with the Quiet Time program by examining its efficacy with high school students. In the current study, the psychological and academic outcomes for a group of students who practiced TM in Quiet Time at one high school were compared to the outcomes of students attending a demographically similar high school in the same school district that had yet to implement the program.

Method

The current study utilized a two-group pretest-posttest design (Shadish et al. 2002) where one group of students received the treatment (e.g., participation in Quiet Time) and a second, similar group received no treatment. Both sets of students were surveyed before and after the treatment implementation.

Sample

Students participating in this study were in the ninth grade during the 2012–2013 school year at two high schools located in the same school district.

Recruitment

Students at the treatment and comparison schools were solicited to participate in a research study. Both groups of students were given informed consent documents to take home for the students' parents/guardians to sign, giving permission for the student to participate in the study. Beyond the informed consent process, the recruitment process varied by study group.

Treatment Group

Groups of ninth graders at the treatment high school (i.e., the high school participating in Quiet Time) attended an introductory talk and a question and answer session on the practice and benefits of TM. At the conclusion of the meeting, students were offered the opportunity to learn TM as a Quiet Time activity and told that participants would be expected to cooperate with data collection, by completing surveys. Those students who expressed interest in participating were given a permission letter to take home to their parents.

Comparison Group

Ninth graders at the comparison high school were asked during their advisory class to participate in a research study on high school student moods, personalities, and school achievement. The data collection requirements were described. Interested students received parent permission letters to take home. Table 1 includes the demographic characteristics of the sample included in the study.

Quiet Time Treatment

TM is a simple, natural, effortless mental technique that allows the mind to experience finer levels of the thinking process until the mind transcends and experiences the source of thought, the simplest form of human awareness, described as the Unified Field of Natural Law (Roth 1987). TM produces a

Table 1 Characteristics of sample

	Treatment high school	Comparison high school
Number	142	53
Ethnicity		
African American	7.7 %	7.5 %
Asian	33.1 %	26.4 %
Filipino	18.3 %	9.4 %
Hispanic or Latino	24.6 %	34.0 %
Pacific Islander	5.6 %	1.9 %
White (not Hispanic)	40.1 %	28.3 %
Female	45.1 %	49.1 %
English learners	12.7 %	18.9 %
Students with disabilities	5.6 %	13.2 %

mind/body state of "restful alertness" with an increased level of integrated brain function (Hebert et al. 2005; Travis 2002).

Students at the treatment high school learned the TM technique in the standard seven-step TM course, which includes a recruitment lecture, a preparatory lecture, and a brief personal interview with the TM teacher, personal instruction on TM (about 1 hour), and three 1-hour group meetings to provide additional knowledge about the practice and to discuss students' experiences. Treatment students were able to practice TM during the designated Quiet Time program, which occurred in the mornings and later afternoons during the school week. Treatment students were also encouraged to practice TM at home during the weekends.

Measures

Psychological Outcomes

The current study assessed changes in five different psychological outcomes. Treatment and comparison group students completed the psychological battery at baseline in October 2012 (i.e., before treatment students learned TM) and again in May 2013, approximately 7 months later.

Positive Mood The Profile of Moods (POMS) Brief Form (McNair et al. 1971) is a 30-item inventory with six five-item scales. Five of the scales measure disturbance (tension-anxiety, depression-dejection, anger-hostility, fatigue-inertia, confusion-bewilderment) and one scale in contrast measures positive mood (vigor-activity). For the current study, we utilized the measure of vigor-activity. Example moods include lively, active, energetic, efficient, full of pep, and vigorous. Participants rated the extent to which they had felt each mood during the previous week (including the day of the survey), using a 5-point response scale (ranging from *not at all* to *extremely*). Higher scores indicate greater positive mood. In the current study, the vigor-activity subscale of the POMS was found to have moderate internal consistency at pretest (α=0.76) and posttest (α=0.72).

Anxiety The State-Trait Anxiety Inventory for Children (STAIC; Spielberger et al. 1973) was used to assess anxiety. The 20-item scale assesses state and trait anxiety. Example items include "I have trouble deciding what to do," "I noticed my heart beats fast," and "I worry about what others think of me." Participants rate each statement on a 3-point scale (1=*hardly ever*, 2=*sometimes*, 3=*often*). Higher scores indicate greater anxiety. In the current study, the STAIC was found to have high internal consistency at pretest (α=0.89) and posttest (α=0.89).

Resilience The Resilience Scale (Wagnild and Young 1993) is a 15-item single-factor instrument that assesses emotional capability to cope with stress and adversity. For each of the 15 items, participants rate how strongly they agree or disagree with the statement (1=*disagree strongly … 7=agree strongly*). Example items include "When I make plans, I follow through with them," "I am friends with myself, " and "I feel that I can handle many things at a time." In the current study, the resiliency scale was found to have high internal consistency at pretest (α=0.84) and posttest (α=0.90).

Self-control Self-control was measured using the 13-item Self-Control Scale (Tangney et al. 2004). Example items include "I do certain things that are bad for me, if they are fun," "I wish I had more self-discipline," and "I have trouble concentrating." Participants rate each item on a 5-point scale (0=*not at all like me*, 1=*a little like me*, 2=*somewhat like me*, 3=*mostly like me*, 4=*very much like me*). Higher scores indicate greater resilience. In the current study, the self-control scale was found to have moderate internal consistency at pretest (α=0.68) and posttest (α=0.71).

Emotional Intelligence The Bar-On Emotional Quotient Inventory (Bar-On 1997) measures emotional and social functioning in adolescents. The inventory includes five subscales including adaptability, interpersonal, intrapersonal, general mood, and stress management. Example items include "I care what happens to other people," "I must tell the truth," and "I get angry easily." Participants rate each of the 30 items on a 4-point scale (1=*not true of me*, 2=*just a little true of me*, 3=*pretty much true of me*, 4=*very much true of me*). Higher scores indicate greater emotional intelligence. In the current study, the Bar-On was found to have moderate internal consistency at pretest (α=0.75) and posttest (α=0.82).

Academic Outcomes

The current study assessed four academic outcomes: instruction time, English language arts achievement scores, grade point average, and number of days suspended. All academic outcomes were obtained from the school district; data were pulled from their data collection mechanism.

Instruction Time Instruction time is the percent of time the student received instruction and is equivalent to class attendance. A score of 100 indicates that the student was present for all of the instruction time.

English Language Arts Scores on the California Standards Tests (CST) were collected for spring 2012 and spring 2013. The English Language Arts (ELA) CST is administered annually in California to all students in grades 2 to 11. Higher scores indicate a greater proficiency.

Grade Point Average Grade point averages for each student were collected for fall 2012 and spring 2013.

Program Satisfaction

CWAE developed a 13-item student survey about Quiet Time practices. The survey asked about the frequency of meditation, how easy it is for the student to meditate, and the perceived impacts of Quiet Time. Only treatment group participants completed this survey. Further, only students who practiced meditation during Quiet Time answered questions regarding participation in meditating.

Data Analysis Plan

As a first step, we investigated differences between the treatment and comparison groups on baseline scale scores for each of the outcomes of interest using *t* tests. Second, we examined changes between baseline and posttest using analysis of covariance (ANCOVA) models between treatment and comparison groups. In the ANCOVA models, the baseline values corresponding to the outcome variable were used as a covariate. Next, we used hierarchical multiple regression to examine differences in posttest outcomes for students who participated in TM, based on the number of times they reported meditating each week. Finally, we examined differences in students' perceptions of Quiet Time using descriptive analyses.

Results

Baseline Comparisons

The *t* test comparisons revealed significant differences between the treatment and comparison groups at baseline for all baseline variables, with the exception of emotional intelligence, the number of days suspended, and the ELA CST 2012 score. According to What Works Clearinghouse (WWC 2014), when baseline differences are greater than 0.25 of a standard deviation, statistical analyses (e.g., analysis of covariance) should include an adjustment for baseline differences (US Department of Education 2014). Based on this recommendation and effect sizes larger than 0.25, we proceeded with analysis of covariance (ANCOVA) models for the outcomes. Table 2 shows the baseline comparisons.

Comparisons Between Treatment and Control Groups

The next series of analyses investigated differences between the treatment and comparison groups on the outcomes, controlling for baseline differences. As shown in Table 2, when controlling for baseline differences, there were significant differences between treatment and comparison group students in anxiety and resilience. Treatment students had significantly lower anxiety and higher resilience at follow-up. No other outcomes were significantly different (Table 3).

Within Treatment Group Analyses

Using hierarchical regression (e.g., multistep regression), we investigated differences within the treatment group to examine time spent meditating as a continuous predictor of student outcomes. In the first step, the corresponding baseline measure was included as a predictor of student outcome. In the second step, time spent meditating was included as a predictor. On average, students reported meditating 7.5 times per week (SD=3.76). Students reported meditating between 0 and 14 times per week. Table 4 presents findings on the relations between meditation frequency and student outcomes.

As seen in Table 4, students who spent more time meditating also had higher resilience, controlling for baseline resilience, compared to students who spent less time meditating; or for each additional time a student reported meditating, there

Table 2 Baseline differences between comparison and treatment groups

Outcome	Comparison students		Treatment students		*t* test	Effect size
	n	*M* (*SD*)	*n*	*M* (*SD*)		
Positive mood	46	12.37 (4.67)	126	10.79 (4.63)	−1.94	−0.34
Anxiety	46	33.52 (7.36)	122	37.39 (7.67)	2.95*	0.50
Resilience	50	78.38 (9.56)	128	71.38 (11.88)	−3.72*	−0.60
Self-control	52	3.06 (0.40)	130	3.02 (0.49)	−0.54	−0.09
Emotional intelligence	52	61.17 (8.02)	109	60.04 (7.34)	−0.88	−0.15
Instruction time	47	98.13 (2.13)	126	96.86 (5.80)	−2.10*	−0.25
ELA CST 2012	41	361.41 (58.7)	118	357.10 (52.7)	−0.44	−0.08
Fall GPA 2012	53	3.44 (0.63)	141	2.71 (1.11)	−5.78*	−0.70

Not all students in the study participated in all surveys or had academic achievement data. Missing data are due to nonresponse

*$p<0.05$

was a 0.25 increase in resilience score (controlling for baseline resilience; the resilience score ranges from 1 to 7). Further, students who spent more time meditating had significantly more instruction time, compared to students who spent less time meditating. For each additional time a student reported meditating, there was a 0.23 (approximately a quarter of a percentage point) increase in the amount of instruction time (controlling for baseline instruction time). Instruction time is the percent of time the student received instruction, where 100 indicates the student was present for all the instruction time. Thus, for each increase in the times a student reported meditating, there was a quarter of a percentage point increase in instruction time. In the case of resilience, time spent meditating explained an additional 6 % of the variance in posttest resilience, beyond baseline resilience.

Students were also queried on their meditation habits and their opinions of TM and Quiet Time. The majority of students (87 %) reported that Quiet Time made their school more peaceful. Further, 94 of 112 students who responded to the question reported that they felt at least somewhat less stressed as a result of Quiet Time. Additionally, 94 of 112 students reported that, because of Quiet Time, they focus better in school. Further, 88 of 112 students reported getting along better with friends because of Quiet Time. The majority of students reported improved sleep (79 %), feeling happier (81 %), and feeling less angry and argumentative (77 %) and more self-confident (73 %) because of Quiet Time. Finally, 98 % (90 of 92 students) of students who reported meditating reported that they found meditation easy to do.

Discussion

In general, Quiet Time students (i.e., the treatment group) reported greater psychological well-being outcomes compared to comparison students who did not participate in Quiet

Table 3 Student well-being outcomes

Outcome	Comparison students			Treatment students			Mean difference	Effect size
	n	Adjusted mean	SE	*n*	Adjusted mean	SE		
Positive mood	41	17.37	0.65	103	17.12	0.41	−0.25	−0.06
Anxiety	40	37.82	8.47	99	32.90	8.19	−4.92*	−0.59
Resilience	42	70.07	12.73	103	76.00	13.93	5.93*	0.44
Self-control	49	3.11	0.46	108	2.98	0.48	−0.13	−0.04
Emotional intelligence	40	58.04	9.62	82	59.64	8.73	1.61	0.18
Instruction time	47	96.11	3.50	126	96.58	7.13	0.47	0.07
ELA CST 2013	41	365.92	43.17	116	357.41	48.66	−8.51	−0.18
Spring GPA 2013	53	2.81	0.73	140	2.89	1.11	0.09	0.03

All models include the baseline equivalent of the outcome variable as the control variable. The adjusted mean was calculated by adjusting the means for baseline levels of the respective outcome. Not all students in the study participated in all surveys or had academic achievement data. Missing data are due to nonresponse

*$p<0.05$

Table 4 Regression models using time meditating as a predictor of outcome

Outcome	Number of students	R^2	*B*	*t*
Positive mood	84	0.09	−0.13	−1.20
Anxiety	78	0.02	−0.29	−1.68
Resilience	82	0.06*	0.25	2.38*
Self-control	85	0.01	0.08	0.86
Emotional intelligence	67	0.00	−.04	−0.35
Instruction time	83	0.05*	0.23	2.27*
ELA CST 2013	79	0.01	0.09	1.56
Spring GPA 2013	93	0.00	0.02	0.41

R^2 represents the R^2 when adding time meditating to the model. All models include the baseline equivalent of the outcome variable as the control variable. Not all students in the study participated in all surveys or had academic achievement data. Missing data are due to nonresponse

*$p<0.05$

Time. Specifically, Quiet Time students self-reported significantly higher resilience and lower anxiety than comparison students. The effect sizes for the anxiety and resilience outcomes are moderate to large. Further, the treatment students were at greater risk at baseline, compared to comparison students; thus, the increases in resilience and anxiety are substantial. The Quiet Time students did not show significantly different academic outcomes compared to their comparison counterparts.

Further evidence supporting the treatment was found when comparing students who reported more frequent meditation compared to students who reported less frequent meditation. Specifically, students who reported meditating more frequently had significantly greater resilience and were present for a greater proportion of class time.

Students who reported participating in Quiet Time also reported positive changes in their sleep, self-confidence, and happiness. Students reported that after participating in Quiet Time, they were better able to focus in school and got along better with their friends. Finally, students who practiced meditating during Quiet Time reported that they found meditating easy to do. The self-report findings, although only captured at posttest, indicate that students have positive perceptions of Quiet Time and benefit from the time set aside each day to spend time quietly.

In terms of reduced psychological distress and improved mental health, previous studies indicate that TM (a piece of Quiet Time) reduces psychological and physiological response to stressors, including decreased sympathetic nervous system and hypothalamic-pituitary-adrenal axis overactivation and reductions in elevated cortisol (stress hormone) level (Barnes et al. 2001; MacLean et al. 1997; Walton et al. 2004). Research also shows a more coherent and integrated style of brain functioning, evidenced by EEG imaging, which is associated with lower stress reactivity (Travis et al. 2009). These physiological changes may underlie the improvements observed in this study on mental health factors.

Limitations

The limitations of the current study include the short duration of the study and the differences between the two samples at baseline. For example, the treatment students differed from comparison students in that they were more at risk compared to the comparison students. Moreover, the comparison students showed a strong decrease in GPA from baseline to follow-up, whereas the same was not true for the treatment students. Thus, the two groups differ in aspects other than receiving the treatment condition. One way to mitigate differences between treatment groups is to randomize students to receive the treatment. Randomization is one way to reduce or eliminate differences between group when there is a large enough sample size. An additional limitation is the reliance on self-reported measures. The self-reported findings from students who participated in Quiet Time are the most susceptible to the impact of self-report because there was no pretest measure. Thus, we were unable to make causal claims of the impact of Quiet Time (Shadish et al. 2002). The final limitation of the current study is that we were unable to disentangle results of Quiet Time (which includes activities such as TM or reading silently) from the practice of TM. Given the positive findings for students who reported meditating more frequently, future studies should study TM in isolation of Quiet Time.

Conclusion

In conjunction with the student self-report of satisfaction with Quiet Time, the findings from the current study indicate that the practice of Quiet Time had a positive impact on the lives of students within and beyond school. Quiet Time only requires time set aside in the school day for students to spend time meditating, reading, or sitting quietly. Because Quiet Time can be practiced with no costs, it is a valuable intervention that can be implemented in schools.

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