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Understanding teachers' stress is of critical importance to address the challenges in today's educational climate. Growing numbers of teachers are reporting high levels of occupational stress, and high levels of teacher turnover are having a negative impact on education quality. Cultivating Awareness and Resilience in Education (CARE for Teachers) is a mindfulness-based professional development program designed to promote teachers' social and emotional competence and improve the quality of classroom interactions. The efficacy of the program was assessed using a cluster randomized trial design involving 36 urban elementary schools and 224 teachers. The CARE for Teachers program involved 30 hr of in-person training in addition to intersession phone coaching. At both pre- and postintervention, teachers completed self-report measures and assessments of their participating students. Teachers' classrooms were observed and coded using the Classroom Assessment Scoring System (CLASS). Analyses showed that CARE for Teachers had statistically significant direct positive effects on adaptive emotion regulation, mindfulness, psychological distress, and time urgency. CARE for Teachers also had a statistically significant positive effect on the emotional support domain of the CLASS. The present findings indicate that CARE for Teachers is an effective professional development both for promoting teachers' social and emotional competence and increasing the quality of their classroom interactions.

Keywords: teacher stress, mindfulness, teacher professional development, classroom interactions, emotion regulation

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Understanding teachers' stress is critical for the stability and effectiveness of educational systems worldwide (Kyriacou, 2011). The most recent survey by MetLife (Markow, Macia, & Lee, 2013), with a demographically representative sample of 1,000 U.S. K–12 public school teachers, found that 59% of teachers reported being under great stress, a dramatic increase from 35% in 1985. There was also a

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statistically significant decrease in teachers' self-reported job satisfaction from 62% in 2008 to 39% in 2012, the largest drop since 1984 when MetLife began the survey. These findings are consistent with a recent Gallup (2014) survey in which nearly half of K–12 teachers (46%) reported high daily stress during the school year, one of the highest stress levels among all occupational groups including nurses (46%) and physicians (45%).

Teacher stress and the resulting attrition are serious problems that negatively impact the quality of education, taking an emotional and psychological toll on school personnel and impacting student behavior and achievement (Greenberg, Brown, & Abenavoli, 2016; Hoglund, Klingle, & Hosan, 2015), particularly among high-poverty schools where both stress and attrition levels are the highest (Alliance for Excellent Education, 2014). Despite the documented high level of teacher stress, little research has addressed ways to reduce it. Developing and testing new approaches designed to help teachers manage the stresses of teaching and improve the quality of classroom interactions that promote student learning is critical to effectively supporting and maintaining the teaching workforce. Responding to this need, the current study examined the efficacy of the Cultivating Awareness and Resilience in Education (CARE for Teachers) professional development program.

Understanding Teacher Stress in the Classroom Context

There are numerous factors related to high levels of teacher stress and consequent burnout worldwide. These include managing student misbehavior, providing support to needy and/or unmotivated students, feeling that their workload is overwhelming, feeling a lack of control over decisions that affect them and their students, having little time to relax due to the need to take a great deal of work home, and feeling the constant pressure to be accountable for student outcomes (Richards, 2012). Indeed, levels of stress among teachers have increased in the current era of high stakes testing (Dworkin & Tobe, 2014). These factors can provoke strong negative emotions and teachers consistently report that coping with these emotions is a major stressor (Carson, Weiss, & Templin, 2010). Negative emotions may impair teachers' cognitive functioning and well-being, which can have a negative effect on instruction (Emmer & Stough, 2001). Frequently experiencing negative emotions may reduce teachers' intrinsic motivation and self-efficacy (Sutton & Wheatley, 2003). Long-term, constant emotional distress can impair teachers' performance leading to burnout (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010), and increased student misbehavior (Osher et al., 2007). In contrast, teachers who manage their stress and effectively regulate their emotions can more frequently experience positive emotions, leading to greater resilience and enjoyment of teaching (Gu & Day, 2007).

Teachers who experience high levels of stress and frustration may transmit these feelings and their impacts directly to students via "stress-contagion" (Wethington, 2000, p. 234). Examining data from a nationally representative sample of first graders (N = 10,700), Milkie and Warner (2011) found that children in classrooms in which teachers reported experiencing greater levels of stress had higher internalizing and externalizing disorders. Similarly, in a Canadian sample of 406 elementary school students and their teachers (N = 17), Oberle and Schonert-Reichl (2016) found that teachers' self-reported burnout was linked to students' physiological stress regulation as measured by the diurnal pattern of cortisol.[1] Higher levels of teacher burnout significantly predicted the variability in students' morning cortisol levels suggesting evidence of an impaired stress response.

A meta-analysis of 65 independent studies of teacher stress drawn from international sources of literature identified improved emotion regulation as a key to preventing teacher stress (Montgomery & Rupp, 2005). The emotional labor teachers expend managing negative emotions may result in emotional exhaustion, a risk factor for burnout (Chang, 2009) and developing adaptive coping strategies may support teachers' well-being and performance (Chang, 2013).

Jennings and Greenberg (2009) presented the prosocial classroom theoretical model and proposed that certain social and emotional competences support teachers' ability to cope with the demands of teaching and prevent burnout. These competencies include self-awareness of emotional states and cognitions and the ability to effectively regulate their emotions while teaching to avoid becoming emotionally depleted and maintain their emotional energy to effectively respond to students' needs. According to the model, when teachers lack the social and emotional competences required to manage the demands of teaching, their well-being erodes and leads to a deterioration of the classroom climate and teacher stress, triggering a "burnout cascade" (p. 492). In contrast, teachers with high levels of social and emotional competences are able to cope with the demands of the classroom, maintain a positive classroom climate, build and maintain supportive relationships with their students, and establish consistent classroom interactions that promote student learning.

Empirical research has begun to show support for this model. For example, a randomized controlled study of the Head Start REDI model found that preschool teachers who received training and weekly mentoring support showed improvements in emotional supportiveness, as measured by the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008), compared with control teachers (Domitrovich et al., 2009). The CLASS is a well-validated and commonly used observational measure of classroom interaction quality that assesses emotional support, classroom organization and instructional support. The REDI training included instruction on a social and emotional learning curriculum and emphasized the importance of generalization of social and emotional learning through extension activities and teaching and classroom management strategies. Similarly, a cluster randomized controlled trial of the RULER social and emotional learning program delivered in fifth- and sixth-grade classrooms targeting both teachers' and students' emotional knowledge, self-awareness, and self-regulation skills, found statistically significant program impacts after two years on classroom interaction quality as measured by the emotional support, instructional support, and classroom organization domains of the CLASS (Hagelskamp, Brackett, Rivers, & Salovey, 2013).

[1] The typical diurnal cortisol cycle involves a burst of secretory activity following awakening with a diurnal decline across the day. A disrupted diurnal cortisol cycle may be evidence of an impaired stress response (Collomp et al., 2016).

Mindfulness-Based Interventions

One method for reducing stress and promoting emotional awareness and self-regulation is through engaging in mindful awareness practices. Various mindful awareness practices have been combined to create mindfulness-based interventions (MBIs). MBIs were popularized as an approach to stress reduction through the work of Jon Kabat-Zinn's (1982) mindfulness-based stress reduction (MBSR) program. Kabat-Zinn (2003) defined *mindfulness* as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (p. 144). In order to further refine this definition for research purposes, Bishop et al. (2004) conceptualized mindfulness as involving two primary dimensions: (a) directing one's attention to the present moment and (b) cultivating an orientation to one's experience marked by curiosity, openness, and acceptance.

Although adapted from practices from a variety of religious traditions, secular mindful awareness practices do not involve religious belief, language, or ritual and the rationale for engaging in such practices is grounded in research. This is particularly important for applications designed for use in public school settings (Jennings, 2016b). Mindfulness can be cultivated through a variety of practices including mindfulness meditation, yoga, tai chi, and Qigong practices and can be practiced formally or informally, such as during routine daily activities like walking, eating, and listening in a mindful state (Williams & Kabat-Zinn, 2011). Over the past decade there has been a rapid growth of mindfulness-based programming delivered in public school settings for both teachers and students (Felver & Jennings, 2016). However, little rigorous research has evaluated its efficacy to reduce teacher stress and improve the quality of interactions between teachers and students in classrooms.

Empirical reviews of MBIs have shown psychological and physiological improvements in clinical and nonclinical adult populations such as reduced stress, anxiety, and depression and increased well-being (Eberth & Sedlmeier, 2012; Khoury et al., 2013; Sharma & Rush, 2014). Considerable research has examined the underlying neurophysiological effects of mindful awareness practices, specifically as they relate to emotion regulation (Corcoran, Farb, Anderson, & Segal, 2010). For example, Hölzel and colleagues (Hölzel et al., 2011, 2013; Tang, Hölzel, & Posner, 2015) found that participants in an 8-week MBSR program showed increased gray matter and brain density in the hippocampus, an area of the brain associated with emotion regulation, compared with wait-list controls.

Effects of Mindfulness-Based Interventions on Teacher Stress

Mindful awareness practices may be particularly useful for helping teachers develop the skills they need to manage the demands of teaching. These practices may promote adaptive emotion regulation and coping which may lead to declines in stress, burnout and distress, and more energy and self-regulatory resources (e.g., more joy, more satisfaction, more well-being) that can then be invested in supportive teacher-student interactions that promote student learning (Roeser, 2016; Roeser, Skinner, Beers, & Jennings, 2012; Skinner & Beers, 2016).

Recently, randomized controlled studies have begun to investigate causal relationships between MBIs and stress reduction among teachers (Crain, Schonert-Reichl, & Roeser, 2016; Kemeny et al., 2012; Roeser et al., 2013) and improvements in classroom interactions (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013). The current study examines the effects CARE for Teachers, which introduces emotion skills instruction, mindful awareness and stress reduction practices and caring and listening practices to promote improved emotion regulation, teaching efficacy and mindfulness and to reduce psychological and physical distress.

The first two pilot studies of CARE for Teachers examined program feasibility and attractiveness and preliminary evidence of efficacy (Jennings, Snowberg, Coccia, & Greenberg, 2011). The first study involved 31 educators from a high-poverty urban setting. The second study involved student teachers and 10 of their mentor teachers working in suburban/semirural schools ($N = 43$). Although educators working in the urban schools showed significant pre–post improvements in mindfulness and time urgency, the suburban/semirural sample did not, suggesting that CARE may be more efficacious in supporting teachers working in high-risk settings.

In a pilot study of the initial efficacy of CARE for Teachers, teachers were randomly assigned to CARE for Teachers ($n = 23$) or a wait-list control group ($n = 27$) and assessed pre- and postintervention on self-report measures to assess their emotion regulation, burnout, mindfulness, and teaching efficacy (Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013). Compared with controls, teachers who received CARE for Teachers demonstrated statistically significant improvements in emotion regulation, mindfulness, and teaching efficacy, and reductions in time-related stress and physical symptoms associated with stress.

Two studies have examined another MBI model designed for teachers, the Stress Management and Relaxation Techniques in Education (SMART) program. The first study randomly assigned teachers ($n = 38$) and parents ($n = 32$) of students with disabilities to receive the SMART intervention or waitlist control group (Benn, Akiva, Arel, & Roeser, 2012). Compared with the control group, SMART participants showed decreased stress and anxiety and increased mindfulness, self-compassion, personal growth, empathy, and forgiveness. Results also showed participants' mindfulness at postintervention mediated treatment effects on stress, anxiety, negative affect, and personal growth measured at a 2-month follow-up.

The second SMART trial involved two samples of elementary and secondary public school teachers, one in the U.S. and one in Canada (Roeser et al., 2013). One hundred and 13 teachers were randomly assigned to SMART or to a wait-list control group and were assessed at pretest, postintervention, and at a 3-month follow-up using self-report measures and physiological indicators of stress including salivary cortisol (Canada only), blood pressure, and resting heart rate. The Canadian sample was also assessed on attentional abilities and working memory using a computer task-based assessment. At posttest, teachers receiving SMART showed decreased occupational stress and burnout, as well as increased mindfulness and self-compassion, compared with control group teachers. In the Canadian sample, teachers receiving SMART also showed improvements in attentional abilities and working memory. No statistically significant intervention effects were found on physiological indicators of stress. Results at the 3-month follow-up

indicated changes in mindfulness and self-compassion at posttest mediated SMART participants' stress, burnout, anxiety, and depression at follow-up.

Another study involving the same sample found that teachers randomized to SMART reported improved mood at work and home and improvements in the amount and quality of sleep (Crain et al., 2016). Intervention-related group differences in mindfulness and rumination (excessive worry) at postintervention partially mediated the reductions in negative mood and increases in sleep quality at 3-month follow-up.

A small pilot study ($N = 18$) examined the effects of MBSR adapted for teachers on psychological distress, mindfulness, self-compassion, burnout, neuropsychological and attentional task performance, diurnal cortisol and observations of interaction quality (Flook et al., 2013). Pre–post comparisons showed that intervention teachers ($n = 10$) showed statistically significant reductions in psychological symptoms and burnout and increases in self-compassion. They also showed improvements in performance on a computer task of affective attentional bias and observer-rated classroom organization. In contrast, the teachers assigned to the control condition ($n = 8$) showed statistically significant declines in diurnal cortisol functioning.

The results of MBIs specifically designed for teachers show promise for reducing teachers' occupational stress, promoting social and emotional competencies, and improving the quality of their classroom interactions. However, interpretation and generalizability have been limited by small samples (Beshai, McAlpine, Weare, & Kuyken, 2016; Flook et al., 2013; Franco, Manas, Cangas, Moreno, & Gallego, 2010; Frank, Reibel, Broderick, Cantrell, & Metz, 2015; Jennings et al., 2013; Poulin, Mackenzie, Soloway, & Karayolas, 2008; Taylor et al., 2016a, 2016b) and no studies to date have accounted for potential school context effects by employing analytic methods appropriate to the multilevel structure of such data in which teachers/classrooms are clustered within schools. Thus, the current study builds on and advances this research by (a) including the largest sample of teachers in an MBI impact study to date, and one that is drawn from a large inner city school district in the U.S., with substantial racial/ethnic diversity, and (b) randomizing teachers within schools and using analytic methods that account for the clustering of teachers and classrooms within schools.

The CARE for Teachers Logic Model

CARE for Teachers is specifically designed to address teachers' social and emotional competences as hypothesized in the CARE for Teachers logic model (see Figure 1). In the present study, the population of focus was K–5 teachers. The CARE for Teachers program elements of emotion skills instruction, mindful awareness and stress reduction practices and caring and listening practices are hypothesized to promote increases in adaptive emotion regulation, teaching efficacy and mindfulness and reductions in psychological and physical distress as well as improvements in classroom interactions that promote learning (e.g., emotional support and classroom organization). The program elements are hypothesized to have a synergistic effect on the hypothesized outcomes such that no one single program element is hypothesized to have a unique and direct impact on any one outcome. A similar logic model was developed and tested in previous studies of CARE for Teachers (Jennings et al., 2011, 2013). For the current study we refined the model slightly in response to previous work.

We hypothesized that teachers randomly assigned to receive CARE for Teachers would show statistically significant improvements in adaptive emotion regulation, teaching efficacy, and mindfulness and reductions in psychological distress and physical distress, compared with teachers randomly assigned to the waitlist condition. We also hypothesized that teachers trained in CARE for Teachers would promote classroom interactions that exhibit higher

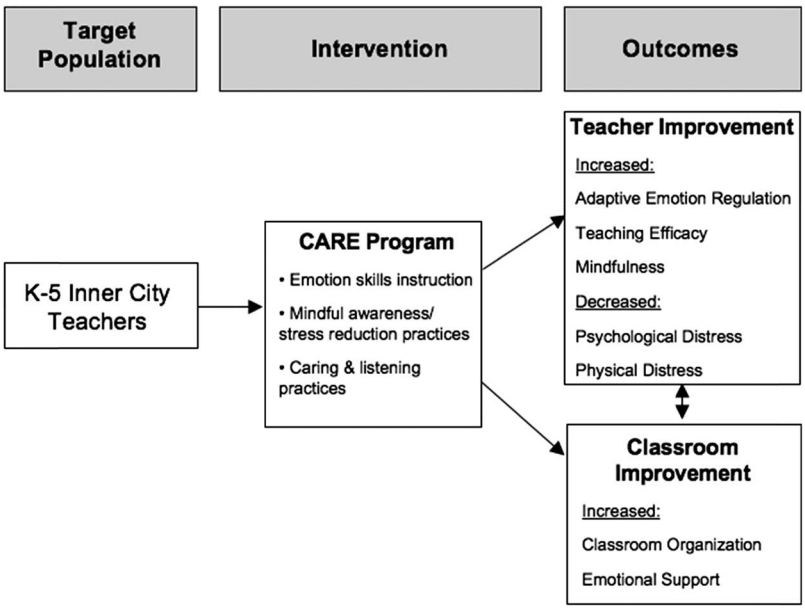

Figure 1. CARE for Teachers logic model.

levels of emotional support and classroom organization than the classrooms of teachers randomly assigned to the waitlist control group. Finally, we hypothesized that teachers who participated in CARE for Teachers would perceive the program as having high social importance and acceptability (e.g., high social validity).

Method

Procedures

Recruitment. School recruitment took place in Spring of 2012 (Cohort 1; C1) and 2013 (Cohort 2; C2) among inner city public K–5 elementary schools in a high poverty region of New York City (the Bronx and Upper Manhattan). We chose elementary schools because teachers at this level spend most of the day with the same group of students and are thus able to have greater influence on observable dimensions of classroom interactions than teachers in secondary schools. High poverty schools were chosen for this study because the results of previous research indicated that CARE for Teachers was most helpful for teachers working in these contexts (Jennings et al., 2011).

Schools were initially recruited by approaching principals of schools in the targeted regions, explaining the CARE for Teachers program and the purpose of the research, and inviting them to participate. In a written memorandum of understanding, principals in each participating school agreed to: support enrollment and participation of at least four teachers per school, help facilitate scheduling of research activities, and support distribution of study information to parents. Principals also agreed to release participating teachers to participate in the CARE for Teachers program during paid work time and to cover the cost of a substitute for each participating teacher for one training day. The study enrolled 36 of the 73 schools approached. Factors that inhibited school recruitment were largely due to principals already having too many programs, too few eligible (see below) teachers, or lack of interest.

Within the 36 participating schools, eligible teachers were identified that met the following criteria: taught in a classroom within the K–5 range of grade levels, taught general education (e.g., no art or physical education teachers), lead teacher in his or her classroom (e.g., no cotaught classrooms),[2] taught the same students for the entirety of the school day, and had classrooms that were representative of the average classroom in this city (e.g., no single gender classrooms). All eligible teachers were invited by their principals to attend recruitment meetings for CARE for Teachers led by the study principal investigators with the support of research staff. The program was described during recruitment as follows:

> CARE is an innovative professional development program that introduces specific skills to help teachers manage stress and improve their teaching effectiveness. CARE combines emotion skills training with mindfulness-based stress reduction activities and provides teachers with opportunities to practice applying these skills in the classroom.

During the meeting, study and teacher participation requirements were described in detail; contact information was collected for all attendees. The following fall, research staff contacted all teachers who attended initial recruitment meetings to complete the consent process. As a result of these efforts, 1,084 teachers were assessed for eligibility, 491 of these did not meet the study inclusion criteria and 68 could not participate for other reasons, leaving 525 eligible teachers.[3]

Sample. Of the 525 eligible teachers approached for participation, 301 declined to participate resulting in a sample of 224 teachers recruited from 36 schools, a 43% response rate ($Mdn = 6$, range = 2–10 teachers). C1 consisted of 53 teachers from 8 schools, and C2 consisted of 171 teachers from an additional 28 schools. Attrition was low at 6% (five from control, eight from intervention) at posttest. Ninety-three percent of participants were female ($n = 209$) and 7% were male ($n = 15$). The sample was racially and ethnically diverse with 74 teachers (33%) identifying as White, 69 (31%) as Hispanic, 59 (26%) as African American/Black, 10 (5%) as Asian, and 12 (5%) identifying as being of a mixed racial background. Teachers' ages ranged from 22–73 years ($Mdn = 40$) and number of years teaching ranged from 0 to 32 years. Ninety-six percent had a Master's/Specialist degree ($n = 213$) or Doctoral Degree ($n = 1$). Active consent was obtained from teachers in accordance with both the University's and district's institutional review board procedures.

Compared with the statistics available for New York City Independent Budget Office in 2014 the sample had more females compared with the general population of elementary/middle school teachers (NYC = 84%). There were fewer White teachers (NYC = 59%) and more Hispanic (NYC = 19%) and African American/Black (NYC = 20%) teachers than the general population of New York City teachers. Participating teachers were similar in age ($M = 41.5$ vs. $M = 40$); however, they reported more years of teaching experience ($M = 12.5$ vs. $M = 10.6$ years). No statistics were available to determine how closely the study sample of teachers matched the general population of New York City teachers with regard to percent holding graduate degrees.

Participants were distributed across grades with 39 (17%) teaching Kindergarten, 40 (18%) in 1st grade, 33 (15%) in 2nd grade, 36 (16%) in 3rd grade, 33 (15%) in 4th grade, 40 (18%) in 5th grade, and three (1%) in multiple grades (one K–1, one 2–3 and one 3–4 combo). One-hundred and 90 (85%) participants were general education teachers, 30 (13%) were teaching in combined language (bilingual, ESL, ELL or dual) classes, and four (2%) teachers endorsed teaching in a special education inclusion classroom as a general education teacher teaching alone (e.g., not coteaching with a special education teacher). Class sizes (the average number of students in the classroom across two observation days) were slightly below the 2014 district average ($M = 23.67$ vs. $M = 25.19$) although there was considerable variation (range = 13–33).

Randomization. The present study evaluated the efficacy of the CARE for Teachers intervention for K–5 teachers and classrooms using a two-level (teachers/classrooms, schools) multisite cluster randomized trial design with intervention at level two (teachers) and schools serving as naturally occurring blocks. Ran-

[2] At the time of recruitment, the New York City schools were beginning to transition to a new model to support efforts to include students with disabilities in the general education classrooms involving special education teachers co-teaching with general education teachers. Due to the limitations of our research design, we could only recruit teachers working in classrooms without a co-teacher.

[3] A CONSORT flow diagram representing the progress through the phases of the present randomized controlled trial and a table reporting on participant attrition are provided in the online supplemental materials.

domization of teachers to CARE for Teachers or the waitlist control group was conducted after baseline data collection by schools and by grade for each cohort. We utilized a block randomization method to randomize participants into groups of approximate equal sample size within schools. This was achieved by establishing a set block size for each school, and then generating all possible balanced combinations of assignments within the block using a computer generated random-number sequence, with a new random-number seed introduced for each iteration. Randomized blocks were then randomly chosen to determine participants' assignment to groups resulting in 118 teachers assigned to receive the CARE for Teachers program and 106 assigned to the wait-list control condition.

We randomized teachers within schools to ensure that teacher assignment was balanced across grade level. Compared with school-randomized designs, randomly assigning teachers within schools has been recommended as a strategy to control between-school variability (Werthamer-Larsson, 1994), and requires fewer schools to achieve adequate statistical power to detect small to moderate effects (Blitstein, Hannan, Murray, & Shadish, 2005; Cornfield, 1978; Raudenbush, Martinez, & Spybrook, 2007; Schochet, 2008). The CARE for Teachers intervention is entirely teacher-focused and does not presume synergistic influences afforded by whole school implementation. While the chosen design posed a potential threat to the internal validity of the experiment due to possible contamination or spillover of program effects from intervention to control group teachers within a school, we decided that the within school randomization was still the preferable design choice and that contamination would be highly unlikely. Furthermore, sharing their experiences of CARE for Teachers program activities with nontrained colleagues would not be likely to provide the necessary detail, scaffolding of learning, and intensity afforded by the direct experience of group participation in the sequenced program activities to effect statistically significant changes in control group teachers. Therefore, we anticipated the risk of contamination would be well below the approximately 50% threshold at or beyond which the random assignment of schools instead of teachers within schools would be preferable (Rhoads, 2011).

Teachers assigned to the intervention condition received CARE for Teachers in the Fall/Winter of 2012–2013 for C1 and 2013–2014 for C2 immediately following initial data collection and randomization. These teachers also received standard professional development activities as assigned by their schools with the exception of one CARE for Teachers training day: on this day intervention teachers received the CARE for Teachers program rather than the standard professional development delivered to all other teachers, including control teachers. Teachers in the wait-list control condition only received standard professional development activities as assigned by their schools. With the exception of time spent in professional development related to stress reduction, mindfulness, or other meditative activities (e.g., CARE for Teachers), no statistically significant differences were found between groups on amount of professional development (i.e., curriculum/academic instruction, student/classroom behavior, and social and emotional learning) received during the intervention school year. Teachers in the control condition were offered CARE for Teachers following the completion of all research activities for their cohort. Of the control teachers, 51% completed the CARE training ($n = 54$).

Intervention/CARE for Teachers. The CARE for Teachers program model is a comprehensive system designed to reduce teachers' stress and to promote and support teachers' social and emotional competences over the course of one full school year. Following best practices in adult learning, CARE for Teachers introduces material sequentially, utilizing a blend of didactic, experiential, and interactive learning processes. The program presents a structured set of mindful awareness practices including breath awareness practice, mindful walking and stretching, listening and compassion practices, as well as didactic and experiential practices to promote emotion awareness and emotion regulation (see Jennings et al., 2011, 2013, and Jennings, 2016a, for more extensive descriptions of the CARE for Teachers program model).

CARE for Teachers was delivered in 30 hr over 5 in-person training days (6 hr each) between November and February; the first two training days were offered back-to-back in November (one of these days was a designated professional development day for all teachers), and then two training days were offered in the subsequent month separated by several weeks. The breaks in between sessions gave teachers an opportunity for practice, reflection, and application of the material to their teaching. Each CARE for Teachers training was presented by a team of three facilitators who met a standard set of requirements, including a minimum of a master's degree in education, psychology or related area, a minimum of two years' experience with the program, and a personal mindfulness practice.

Over 90% of the participants attended at least 4 of the 5 days ($M = 4.49$) of the program. All participants received a program workbook, along with an audio CD/MP3 of recorded mindful awareness practices to facilitate home practice. In addition to in-person sessions, teachers were scheduled to receive a series of three one-on-one phone coaching calls (DeWeese et al., in press). Each participating teacher was assigned to a specific coach for the duration of the program. Coaches were either facilitators or training fidelity coders who had completed at least one CARE for Teachers training. Coaching calls were offered during intersession breaks following Days 2, 3, and 4; on average the calls lasted 26 min (range = 9–60 min) and were intended to support teachers' development of personal mindful awareness practices and the application of CARE for Teachers skills and concepts to their teaching. Participants completed a CARE for Teachers practices questionnaire either before or during the coaching call. Coaches discussed with participants their use of practices, what they found helpful, and whether they had any questions or challenges for which they needed support. Coaching calls were conducted regardless of participants' attendance at sessions; a brief review of material was provided if a participant was absent for the session prior to a given call.

Teachers were compensated at the district approved training rate of $19.12 an hour for one 6-hr training day that occurred on the weekend. Schools were compensated for substitute teacher pay for two training days scheduled while school was in session. Schools covered the cost for one day of substitute teacher pay. No compensation was provided to schools or teachers for the one training day offered during the regularly scheduled in-service professional development day.

Fidelity and quality. Two aspects of implementation were assessed: fidelity and quality. Fidelity was assessed by two trained fidelity coders for all CARE for Teachers sessions using the CARE Daily Session Rating Forms (Doyle, Jennings, DeWeese, & Frank, 2014). The Daily Session Rating Form is an observational measure that assessed the completion of program components and how well the participant learning objectives were met. Codes were checked for reliability and disagreements were rectified by consensus with support from the coding supervisor. On average, 88% (range = 86–91%) of the facilitation activity components listed in the manual were completed. Interrater reliability for component measurement was acceptable ($\kappa = .67$; Cohen, 1960). Completion of participant learning objectives for each activity was rated on a 0–4 scale. Participant objectives were met at an adequate to exemplary level ($M = 3.43$, range = 3.29–3.65). Interclass correlation ratings for "objectives met" were excellent (.75).

The quality of facilitation skill was coded using the CARE Facilitator Rating Form, a modified version of the Iowa Strengthening Families Program Facilitator Delivery Ratings (Iowa State University Extension and Outreach, 2010). Coders provided ratings each day on 10 positive (e.g., engaging participants, explaining material well) and six negative (e.g., losing track of time, being critical of participants) facilitation skills (rated on a 0–4 scale). Overall, facilitators demonstrated a high level of positive and low level of negative facilitation skills ($M = 3.77$). Interclass correlation ratings for facilitation skill were excellent (.79).

Data Collection

Self-report and report on student assessments. Participants completed an online battery of self-report measures and assessments of the students in their class prior to the intervention in fall and again in spring of the same school year. Measure items were grouped by measure and were not randomized. Teachers were compensated for survey completion during afterschool hours equivalent to the district pay rate of $42 an hour. The questionnaires at each time point took approximately 45 min to complete.

Classroom observations. Observations of the overall quality of interactions between teachers and students were conducted by trained, independent observers in the classroom in both the fall (preintervention) and spring of the school year using CLASS (Pianta et al., 2008). The K–3 version of the CLASS was used for all classrooms (K–5) to maintain measurement consistency across all classrooms. Observations were conducted by 24 ethnically diverse certified coders who were blind to teacher intervention condition. In addition to required certification in the CLASS, observers also received live training, and participated in regular calibration meetings and midpoint reliability checks. Two observations of each participating teachers' classroom were conducted at both pre- and postassessment. Observations took place on two separate days within the same week for approximately one hour each day while the target teacher was instructing the class. Each observation day consisted of three 22-min cycles; each cycle was comprised of a 15-min interval of observing CLASS indicators and a 7-min coding period. Observers were randomly assigned to each observation day; different observers coded the first and second day at pre- and postassessment to control for coding bias due to prior exposure. Thirty-three percent of the 867 total observations were double-coded across pre- and posttest. No compensation was provided to teachers for classroom observations.

Measures

Measures were selected based on our previous research (and other research on MBIs with teachers and other adult populations) and the CARE for Teachers logic model proposing that the program has direct effects on teachers' adaptive emotion regulation, teaching efficacy, mindfulness, psychological distress, physical distress and the quality of classroom emotional support and organization.

Self-report and assessment of students. Participants completed self-report measures to assess adaptive emotion regulation, teaching efficacy, mindfulness, psychological distress and physical distress. Teachers assessments of their students were collected at the same time via the same online system (e.g., proportion of students with IEPs or 504 plan, ever suspended, and average learning support at home). Coefficient alphas for self-report scales were computed for all measures at pre- and posttest. Ranges of coefficient alphas at both time points are provided for each measure below.

Adaptive emotion regulation. One measure, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), was used to assess teachers' adaptive emotion regulation. This 10-item scale assesses two emotion regulation strategies: cognitive reappraisal and expressive suppression. Respondents reported on emotional experience ("what you feel like inside") and emotional expression ("how you show your emotions in the way you talk, gesture, or behave") on a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*). Coefficient alphas ranged from .67 to .68.

Teaching efficacy. One measure, the Teachers' Sense of Efficacy Questionnaire-Short Form, was used to assess teaching efficacy (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). This short form is a 12-item measure of three dimensions of teaching efficacy: *efficacy for instructional strategies* (e.g., "How much can you use a variety of assessment strategies?"), *efficacy for classroom management* (e.g., "How well can you keep a few problem students form ruining an entire lesson?"), and *efficacy for student engagement* (e.g., "How much can you do to foster student creativity?"). Items asked teachers to indicate "how much they can do" in response to various classroom and instructional challenges; items were rated on a 9-point Likert scale (1 = *nothing* to 9 = *a great deal*). Coefficient alphas ranged as follows: efficacy for instructional strategies = 0.85, efficacy for classroom management = .83–.85, and efficacy for student engagement = .78–.83.

Mindfulness. Two measures assessed general mindfulness and mindfulness as it applies to classroom interactions. The first measure used was The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This 39-item instrument has five subscales: *observing* (e.g., "I pay attention to how my emotions affect my thoughts and behavior"), *describing* (e.g., "Even when I'm feeling terribly upset, I can find a way to put it into words"), *acting with awareness* (e.g., reverse item: "I find myself doing things without paying attention"), *nonjudgmental* (e.g., reverse item: "I tell myself I shouldn't be feeling the way I'm feeling"), and *nonreactive* (e.g., "When I have distressing thoughts or images, I feel calm soon after"). Respondents were asked to indicate the extent to which various

mindfulness-related statements are generally true for them; items were rated on a 5-point Likert scale (1 = *never or rarely true* to 5 = *very often or always true*). Coefficient alphas for the subscales ranged as follows: *observing* = .83–.85; *describing* = .89–.91; *acting with awareness* = .89–.91; *nonjudgmental* = .85–.92; and *nonreactive* = .74–.77.

The second measure used was the 5-item interpersonal mindfulness subscale of the Mindfulness in Teaching Scale (MTS; Frank, Jennings, & Greenberg, 2016). Items are focused on mindfulness as it applies to classroom interactions (e.g., reverse item: "I am often so busy thinking about other things that I am not really listening to my students"). Items are answered on a 5-point Likert-type scale indicating how true each statement is for the respondent (1 = *never true* to 5 = *always true*). The coefficient alphas for *interpersonal mindfulness* ranged from .66 to .72.

Psychological distress. Seven measures were used to assess teachers' psychological distress. The first measure used was the Patient Health Questionnaire 8-item Depression Scale (PHQ-8; Kroenke et al., 2009). This 8-item measure of depressive symptoms (e.g., "feeling down, depressed, or hopeless") is rated on a 4-point Likert-type scale (1 = *not at all* to 4 = *nearly every day*). The coefficient alphas for the PHQ-8 was .87 at pre- and posttest.

The second measure used was the Generalized Anxiety Disorder 7-item Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) from the Patient Health Questionnaire. It measures generalized anxiety symptoms (e.g., "feeling nervous, anxious, or on edge") on a 4-point Likert-type scale (1 = *not at all* to 4 = *nearly every day*). The coefficient alphas for the GAD-7 ranged from .92 to .93.

The third measure used for psychological distress was the International Positive and Negative Affect Rating Short Form (PANAS; Thompson, 2007). This brief 10-item measure asks participants to rate how they "felt during the past few weeks" on 10 emotions using a 5-point Likert-type scale (1 = *very little or not at all* to 5 = *extremely*). Coefficient alphas for the positive and negative affect subscales ranged from .75 to .92.

The forth measure used was the Patient Reported Outcomes Measurement Information System Sleep Disturbance Questionnaire (PROMIS; Buysse et al., 2010). This 4-item scale asks participants to rate the quality of their sleep and sleep patterns over the past 7 days (e.g., "My sleep quality was refreshing") on a 5-point Likert-type scale (1 = *not at all* to 5 = *very much*). The coefficient alphas for the PROMIS ranged from .85 to .87.

The fifth measure is the Emotional Exhaustion subscale of the Maslach Burnout Inventory–Educators' Survey (MBOI; Maslach, Jackson, & Leiter, 1997). This subscale measures burnout syndrome in teachers, (e.g., "I feel emotionally drained from my work") on a 7-point Likert-type scale (1 = *never* to 7 = *every day*). Coefficient alphas for the *emotional exhaustion* subscale were .91 at pre- and posttest.

The sixth measure of psychological distress used is the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The PSS is a 4-item scale that assesses how difficult stressors were to handle over the last month (e.g., "How often have you felt that you were unable to control the important things in your life?"). Items are rated on a 5-point Likert-type scale (1 = *never* to 5 = *very often*). The coefficient alphas for the PSS ranged from .77 to .78.

The final scale used is the Time Urgency Scale (TUS; Landy, Rastegary, Thayer, & Colvin, 1991). The TUS assesses the multidimensional construct of time pressure (e.g., time-related stress). The subscales measure *speech patterns* (five items such as "I talk more rapidly than most people"), *eating behavior* (five items such as "I eat rapidly, even when there is plenty of time"), *competitiveness* (six items such as "I go all out'"), *task-related hurry* (three items such as "I usually work fast"), and *general hurry* (five items such as "I often feel very pressed for time"). Respondents were asked to indicate the extent to which various descriptors applied to them personally on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). Coefficient alphas for the subscales ranged as follows: *speech patterns*, .70–.75; *eating behavior*, .85; *competitiveness*, .73–.74; *general hurry*, .73–.82; and *task-related hurry*, .54–.65.

Physical distress. Two measures were used to assess teachers' physical distress. The first measure is the Gastrointestinal and General Aches subscales Daily Physical Symptom Checklist (DPS; Larsen & Kasimatis, 1991). Participants were asked to indicate (yes/no) whether they experienced each particular symptom "today." Symptoms included pain such as headache and backache and gastrointestinal problems such as nausea and diarrhea. A sum score was created for each subscale; coefficient alphas ranged as follows: gastrointestinal = .55–.58, aches = .56–.63.

The second measure of physical distress focused on participant medication use. Participants were asked to indicate (yes/no) whether they were currently taking medications for 12 different common conditions (e.g., hypertension, heart condition, hormone replacement). A sum score for medication use was created. Coefficient alphas ranged across pre- and posttest from .27–.28; low alphas are expected as most conditions were not expected to correlate.

Teacher reports on student assessments. To assess the proportion of students in each class with an IEP or 504 plan, teachers were asked to respond (yes/no) to the following question, "Does this child have an IEP or 504 plan?" To assess the proportion of students in each class who had ever been suspended, teachers were asked to respond (yes/no) to the following question, "Has this child ever been suspended from school because of misbehavior?" If data was found missing on either of these items, we substituted the missing data with data from school records. To assess the average level of home support for learning of students in each class, teachers were asked to respond to the following question about each of their students using a 4-point Likert-type scale, "How would you characterize the level of support for learning in this child's home?" Responses ranged from 1 = *very poor* to 4 = *very good*.

Classroom observations. The CLASS (Pianta et al., 2008) assesses interactions between teachers and students and can be grouped into three domains of quality: *emotional support* (comprised of four dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspective), *classroom organization* (comprised of three dimensions: behavior management, productivity, and instructional learning formats), and *instructional support* (comprised of three dimensions: concept development, quality of feedback, and language modeling). Although we hypothesized that CARE for Teachers would impact the domains of *emotional support* and *classroom organization*, we included all three domains in our coding protocol to maintain measure validity as previous research on the validity and reliability of the CLASS included all three domains in the coding protocol.

Observers rated the CLASS dimensions (1 = *very low* to 7 = *very high*) during the three observational cycles on two days at each data collection wave. Scores were averaged across the coding cycles within dimension and then within domain. Thus, a participant's observation score is based on the average of all 15-min observations collected at pre- and posttest; observers' scores from double-coded classrooms were averaged to create one score.

The internal reliabilities of *emotional support* and *classroom organization*, and *instructional support* were high (.87–.90) across pre- and posttest. The domain averages were moderately to highly correlated within wave (rs = .64–.81, $p < .01$). Interrater reliability (IRR) was calculated using the 867 (32.7%) observations that were double-coded across pre- and posttest. IRR was calculated using a one-way random intraclass correlation (ICC). ICCs fell in the good to excellent range (.60–.93) for all CLASS dimension and domain scores across pre- and posttest (Cicchetti, 1994).

Social validity assessment. To examine participants' perceptions of the social importance and acceptability of the CARE for Teachers program, participants completed the CARE Acceptability Questionnaire. Participants who attended the final booster session completed the form at the end of the training day along with their self-assessment. Those who did not attend the booster session received an online version of the survey via e-mail. This measure was expanded to 23 items from its original 10-item version used in previous research (Jennings et al., 2013). Participants rated their overall satisfaction with the program and specific components (program content, facilitator skill, program length, setting, program design, communication from facilitators and coaching calls) on a 5-point scale (1 = *highly unsatisfied* to 5 = *highly satisfied*). They also rated their agreement to a set of statements related to perceived changes in teaching effectiveness and stress (1 = *strongly disagree* to 5 = *strongly agree*), perceived effects on students' behavior and academic performance (1 = *much worse* to 5 = *much better*), and perceived impact on job performance in comparison to other professional development programs (1 = *much lower* to 5 = *much higher*).

Results

In this section we first report preliminary analyses including the distributional properties of our sample, our handling of attrition and missing data, the comparability of intervention and control groups, our data reduction approach to teacher self-report outcomes, and results from our training process evaluation. This is followed by a description of our primary outcome analysis strategy and results of the impacts of CARE for Teachers on teachers and classroom interaction quality.

Preliminary Analyses

Descriptive and distributional properties of sample. We first examined distributions, outliers, multicollinearity, homogeneity of variance, and unusual patterns of missing data. Results revealed no statistically significant deviations from normality, variance, or multicollinearity on any scale variables. No unusual missing item patterns were detected, and, as described above, all standardized alpha values at baseline were in the acceptable range (α = .67–0.96).

Attrition and missing data. A variety of strategies were used to minimize attrition and total attrition levels were low (n = 15; 7%). Examination of possible intervention by attrition interactions yielded no statistically significant differences on pretest variables. Missing data were handled using the full information maximum likelihood estimation method under the assumption that missing is at random (Little & Rubin, 2002).

Comparability of intervention and control groups. Table 1 summarizes teacher- and classroom-level descriptive statistics by intervention and control status. Teacher-level descriptive statistics

Table 1
Teacher and Classroom Characteristics by Intervention and Control Status

Teacher and classroom characteristics	Total			Intervention			Control		
	Valid *n*	%	*M* (*SD*)	Valid *n*	%	*M* (*SD*)	Valid *n*	%	*M* (*SD*)
Cohort	224			118			106		
Cohort 1		23.7			22.0			25.0	
Cohort 2		76.3			78.0			75.0	
Teacher race/ethnicity	224			118			106		
White		33.4			34.8			31.1	
Non-White		66.6			65.2			68.9	
Classroom grade level	221			116			105		
Grade K–3		67.0			62.1			72.4	
Grade 4–5		33.0			37.9			27.6	
Classroom type	224			118			106		
General ed		84.4			83.1			85.9	
Other		15.7			16.9			14.1	
Student:teacher ratio	224		17.89 (5.26)	118		17.81 (5.38)	106		17.99 (5.16)
Proportion of IEP students	224		.10 (.09)	118		.10 (.09)	106		.10 (.09)
Proportion of suspended	205		.03 (.07)	107		.04 (.08)	98		.02 (.04)
Avg. learning support at home	214		3.56 (.53)	112		3.58 (.49)	102		3.53 (.57)

Note. Student:teacher ratio is an average of the number of students and teachers in each classroom at the time observations occurred. Proportion of IEP or 504 plan students and proportion of suspended collected from teachers except for 17 cases where these data were missing and therefore replaced with data from the New York City Department of Education Records. Avg. learning at home data collected from teacher report. See Measures section for more information.

include cohort and race/ethnicity. Classroom-level statistics include grade level, classroom type, student-teacher ratio, proportion of students with an IEP or 504 plan, proportion of students ever suspended, and teacher report of students' average learning support at home. The analyses found no statistically significant differences in baseline demographic characteristics between the two conditions. There were also no differences between groups on baseline outcome measures even after controlling for multiple pairwise contrasts. Thus, at baseline, randomization was effective in ensuring intervention and control groups were well balanced.

Data reduction of teacher self-report outcomes. To reduce the number of statistical tests across numerous teacher self-report assessments to the most theoretically and empirically relevant underlying constructs, we examined scale-level correlations and conducted exploratory and confirmatory factor analyses to identify a core set of meaningful higher-order constructs. In these analyses, we excluded teachers' physical symptoms and medication usage because they could not be grouped meaningfully into any categories. We utilized exploratory factor analysis using maximum likelihood estimation with promax oblique rotation to extract a set of cohesive factor constructs (Lorenzo-Seva & ten Berge, 2006).[4]

The first factor we identified as *mindfulness*, included all five mindfulness subscales from the FFMQ: observing, describing, acting with awareness, nonjudgmental and nonreactive; also included was the interpersonal mindfulness from the MTS. The second factor was labeled *psychological distress*, consisted of measures for depression (PHQ), anxiety (GAD), negative affect (PANAS), sleep disturbance (PROMIS), emotional exhaustion (MBI), and perceived stress (PPS). The third factor we identified as *time urgency* consisted of all subscales from the Time Urgency Scale: eating-related hurry, speech-related hurry, general hurry, task-related hurry, and competitiveness. We had originally included the TUS as a measure of psychological distress; however only task-related hurry cross-loaded on factor 2. The fourth factor, *teaching efficacy*, consisted of measures of teacher-reported self-efficacy in student engagement, instruction, and classroom management from the TSES.

We then subjected each derived factor to a confirmatory factor analysis to ensure adequate fit to our empirically derived measurement model. Examination of relative (CFI and TLI) and absolute overall model fit indices (RMSEA) suggested adequate fit of our measurement model to the data. Cronbach's alphas were .68 for *mindfulness*, .62 for *psychological distress*, .70 for *time urgency*, and .84 for *teaching efficacy*.

Three relevant measures—the cognitive reappraisal and expression suppression subscales of the ERQ and positive affect from the PANAS—were included in the initial exploratory factor analyses but did not load on any of the four empirically derived and theoretically consistent factors. In order to assess the construct of adaptive emotion regulation, assessed using cognitive reappraisal and expression suppression, we created a factor derived from averaging these measure items (after reverse scoring the expression suppression items). Cronbach's alpha was .67 for *adaptive emotion regulation*.

Social validity assessment. On the end-of-training CARE Acceptability Questionnaire, intervention teachers reported high levels of satisfaction ($M = 4.47$, $SD = .50$) with the program. Teachers also reported a high level of self-perceived improvement ($M = 4.00$, $SD = .49$). Specifically, teachers reported improvements in their well-being (88%) and self-awareness (96%) and many (63%) also indicated feeling less job stress as a result of the program. They also strongly agreed or agreed that as a result of CARE for Teachers they were "better able to promote awareness and concentration among their students" (87%), "manage classroom behaviors effectively and compassionately" (86%) and "better able to establish and maintain supportive relationships" with their students (91%).

Participants also reported seeing improvements in their students ($M = 3.87$, $SD = .56$). Specifically, teachers reported that their students were better or much better in regard to their pro-social behavior (78%), on-task behavior (75%), and academic performance (58%). Finally, teachers also were very willing to recommend the CARE program for other teachers ($M = 4.44$, $SD = .57$) Almost all teachers (95%) reported that they strongly agreed or agreed that this type of program should be integrated into preparation and in-service training.

Main Analyses

Outcome analysis strategy. Primary study outcomes were analyzed using two-level Hierarchical Linear Models for continuous outcomes or two-level Hierarchical Generalized Linear Models for count outcomes (e.g., physical symptoms and medication use) to account for the clustering of teachers within schools. For each model, only intercepts were allowed to vary randomly across schools. All analyses were performed in MPLUS, Version 7.2 (Muthén & Muthén, 1998-2012) using maximum likelihood estimation. We examined intervention impact on each outcome controlling for a set of covariates to maximize statistical power and precision of an intervention effect estimate. For self-report models, in the absence of baseline differences on demographic and baseline measures and/or preexisting hypotheses, only pretest scores and cohort were included. For classroom observational models additional covariates with known relationships to variations in teacher performance were included (grade level, classroom type, student-teacher ratio, teacher race, proportion of students with an IEP or 504 plan, proportion of students ever suspended, and teacher perceived average level of support for learning in the home). Pretest scores, student-teacher ratio, and average level of learning support at home were grand-mean centered. Effect sizes for statistically significant effects from the self-report and classroom observation models were calculated by dividing the adjusted mean difference by the unadjusted pooled standard deviation (Cohen, 1988). As recommended by the What Works Clearinghouse (Institute of Education Sciences, 2014), an improvement index (U3) was computed by calculating the difference between the percentile rank of the average teacher or classroom in the intervention condition and that of the average teacher or classroom in the control group.

As teacher medication usage and physical symptoms used count models, we first examined zero-count distributions and tested for

[4] A complete description of the factor analytic procedures and results can be found in the online supplementary materials. We have also compared the factor loading patterns between promax oblique rotation and varimax orthogonal rotation of the selected four-factor EFA model. The two factor loading patterns were consistent with a congruence coefficient = .95 (≥.90 is regarded as satisfactory similarity between two patterns; Lorenzo-Seva & ten Berge, 2006).

overdispersion using the overdispersion parameter, *alpha*. For medication usage and ache-related symptoms, the overdispersion parameters were not significantly different from zero ($ln(alpha) = 0.00$, $p > .99$ for both variables), satisfying the assumption of the Poisson distribution that the conditional mean and variance are equal (Long & Freese, 2006). We thus used a Poisson model for these outcome variables. As analyses of gastrointestinal-related symptoms did reveal significant levels of overdispersion ($ln(alpha) = 1.77$, $p < .05$), suggesting a departure from the Poisson distributional assumption, we used a Negative Binomial model, which corrects for overdispersion by adding a parameter that allows the conditional variance to be different from the conditional mean (Long & Freese, 2006).

Impact on teachers and classroom interaction quality. Below we report impact estimates of CARE for Teachers on teachers' self-report measures and observed classroom interaction quality. Table 2 presents means and standard deviations for teacher scales and classroom processes by intervention status.

Impact on teachers' self-report measures. Table 3 presents the results of the program impact on the five factors: four aggregate factors (i.e., teaching efficacy, mindfulness, psychological distress and time urgency); and the factor assessing teachers' adaptive emotion regulation. Statistically significant direct effects of CARE for Teachers were found for four out of the five factors. Participation in intervention led to statistically significant increases in adaptive emotion regulation, $t = 2.98$, $p = .005$ and mindfulness, $t = 2.71$, $p = .007$ and statistically significant reductions in psychological distress, $t = -1.99$, $p = .047$, and time urgency, $t = -2.32$, $p = .020$. The adjusted mean differences of 0.24 and 0.14 for adaptive emotion regulation and mindfulness correspond to effect sizes of 0.35 and 0.28, respectively. The adjusted mean differences of −0.13 and −0.10 for psychological distress and time urgency correspond to effect sizes of −0.18 and −0.20, respectively. There were no statistically significant effects on the factor assessing teaching efficacy.

The results of intervention impact on teachers' physical symptoms and medication use are displayed in Table 4. The program impact was not statistically significant for any of the three count outcomes, ache-related symptoms, gastrointestinal symptoms, and sum of medication; however, there was a tendency for CARE teachers to report fewer symptoms and medication use. The estimated incident rate ratios associated with the intervention were .805, .604, and .866 for ache-related symptoms, gastrointestinal symptoms, and medication usage, respectively. Effect sizes, measured as percentage change in expected count and calculated by subtracting 1 from incident rate ratio estimates and multiplying 100, indicated that CARE for Teachers reduced teachers' ache-related symptoms, gastrointestinal symptoms, and medication use by 19.5%, 39.6%, and 13.4%, respectively.

Impacts on classroom quality of interactions. Table 5 presents the results of the program impact on the CLASS domains and dimensions. The intervention had a statistically significant positive effect on the domain of emotional support ($t = 1.96$, $p = .051$, $ES = 0.22$), and positive effects on two of its associated dimensions, positive climate ($t = 2.15$, $p = .031$, $ES = 0.23$) and teacher sensitivity ($t = 1.99$, $p = .046$, $ES = 0.23$). There was also a marginally statistically significant positive effect of intervention on the domain of classroom organization ($t = 1.68$, $p = .093$, $ES = 0.19$) and a statistically significant positive effect on one of its associated dimensions, productivity ($t = 1.94$, $p = .052$, $ES = 0.23$). There was no statistically or marginally significant effect on the domain of instructional support or the associated dimensions.

Table 2
Teacher Scales and Classroom Processes by Intervention and Control Status

Teacher scales and classroom processes	Pre *M* (*SD*)		Post *M* (*SD*)	
	Intervention	Control	Intervention	Control
Teacher aggregate factors				
Adaptive emotion regulation	4.85 (0.70)	4.81 (0.71)	5.00 (0.70)	4.75 (0.68)
Teaching efficacy	7.15 (0.94)	7.01 (1.03)	7.31 (0.93)	7.22 (0.98)
Mindfulness	3.55 (0.43)	3.55 (0.42)	3.68 (0.49)	3.56 (0.46)
Psychological distress	2.57 (0.73)	2.67 (0.76)	2.37 (0.71)	2.51 (0.70)
Time urgency	3.24 (0.53)	3.37 (0.53)	3.16 (0.50)	3.31 (0.49)
Teacher physical distress				
Ache-related symptoms	1.27 (1.27)	1.17 (1.25)	.97 (1.11)	1.11 (1.18)
Gastrointestinal symptoms	0.29 (0.74)	.36 (0.72)	.21 (0.58)	0.37 (0.81)
Medication use	1.03 (1.10)	1.22 (1.10)	1.00 (0.92)	1.18 (1.19)
Quality of classroom interactions				
Emotional support	4.92 (0.80)	5.00 (0.70)	4.92 (0.76)	4.81 (0.74)
Positive climate	4.78 (1.10)	4.86 (1.01)	4.61 (1.02)	4.45 (0.98)
Negative climate	6.40 (0.70)	6.48 (0.60)	6.57 (0.56)	6.50 (0.58)
Teacher sensitivity	4.77 (0.97)	4.87 (0.89)	4.83 (0.98)	4.67 (0.98)
Respect for student perspective	3.73 (0.92)	3.81 (0.83)	3.69 (0.91)	3.64 (0.85)
Classroom organization	4.86 (0.90)	4.97 (0.80)	5.13 (0.86)	5.01 (0.88)
Behavior management	5.06 (1.06)	5.09 (0.88)	5.30 (1.02)	5.20 (0.99)
Productivity	5.13 (0.95)	5.28 (0.89)	5.45 (0.93)	5.26 (0.97)
Instructional learning formats	4.41 (0.97)	4.53 (0.93)	4.64 (0.86)	4.56 (0.93)
Instructional support	2.75 (0.67)	2.77 (0.71)	2.49 (0.65)	2.51 (0.65)
Concept development	2.38 (0.63)	2.54 (0.74)	2.18 (0.62)	2.25 (0.63)
Quality of feedback	3.03 (0.85)	3.01 (0.87)	2.82 (0.86)	2.76 (0.77)
Language modeling	2.83 (0.77)	2.76 (0.70)	2.47 (0.69)	2.53 (0.72)

Table 3
CARE for Teachers Impacts on Aggregate Factors

Aggregate factors	Estimate	*SE*	*t*	*p*	Effect size	U3	Improvement index %
Adaptive emotion regulation	.22	.08	2.98	.005*	.35	.64	13.68
Teaching efficacy	.07	.11	0.59	.556	.07	.53	2.79
Mindfulness	.13	.05	2.71	.007*	.28	.61	11.03
Psychological distress	−.13	.06	−1.99	.047*	−.18	.43	−7.14
Time urgency	−.10	.04	−2.32	.020*	−.20	.42	−7.93

* $p < .05$.

Post hoc analysis of subscales. For the three of four aggregate factors that showed statistically significant intervention impacts, we explored which subscales contributed to the overall effects (see Table 6).

Statistically significant program effects were found for 2 out of 6 subscales of mindfulness factor, nonjudging ($t = 2.04$, $p = .041$, Effect Size [*ES*] = 0.21) and observing ($t = 3.46$, $p = .001$, $ES = 0.41$); 2 out of 6 subscales of psychological distress, sleep ($t = 2.25$, $p = .024$, $ES = 0.26$) and emotional exhaustion ($t = -2.08$, $p = .037$, $ES = -0.22$); and, 2 out of 5 subscales of time urgency factor, speech ($t = -2.21$, $p = .027$, $ES = -0.18$) and task-related hurry ($t = -2.07$, $p = .038$, $ES = -0.22$).

Although we hypothesized that the intervention would have positive direct impacts on positive affect, as assessed using the PANAS positive affect subscale, it did not load with any conceptually appropriate aggregate factor. We therefore examined the program's direct impact on PANAS positive affect post hoc but found no statistically significant program effect.

Discussion

A growing body of evidence has demonstrated that teaching is a highly stressful profession and teacher stress has negative impacts on the quality of their classroom learning environment. Despite this evidence, little research has addressed ways to reduce teacher stress. The current study responded to this need by examining the efficacy of the CARE for Teachers program. The program was developed to promote the teacher social and emotional competencies described in Jennings and Greenberg's (2009) prosocial classroom model, proposing that when teachers lack certain social and emotional competences, their well-being erodes leading to a deterioration of the classroom climate and teacher stress. In contrast, teachers with high levels of social and emotional competencies are able to promote high quality classroom interactions that promote student learning.

The CARE for Teachers program elements of emotion skills instruction, mindful awareness and stress reduction, caring and listening practices were hypothesized to result in increases in adaptive emotion regulation, teaching efficacy and mindfulness and reductions in psychological and physical distress, as well as improvements in classroom interactions that promote learning (e.g., emotional support and classroom organization). In this discussion, we examine the practical importance of the impacts of CARE for Teachers on teacher and classroom outcomes and place these results within the context of the larger field of MBIs for teachers, including a review of study strengths and limitations, suggestions for future research and study implications.

Table 4
CARE for Teachers Impacts on Teacher Physical Distress

Impact	Estimate	*SE*	*t*	*p*	Effect size
Ache-related symptoms	−.22	.14	−1.59	.112	−19.5%
Gastrointestinal symptoms	−.50	.35	−1.46	.145	−39.6%
Medication use	−.14	.13	−1.08	.280	−13.4%

Practical Importance of Study Impacts

Here we review the study results and examine their practical importance in terms of the improvement index (What Works Clearinghouse; Institute of Education Sciences, 2014), and in relation to previous work.

Impact on teachers. Estimates of program impacts indicate that compared with control teachers, teachers who received CARE for Teachers reported significantly higher levels of functioning on four of the five factors that assessed broad domains hypothesized to be effected by the intervention. Compared with teachers in the control group, at the end of one school year intervention teachers showed higher levels of adaptive emotion regulation and mindfulness and lower levels of psychological distress and time urgency. These intervention effects were modest. In terms of the practical importance, on average, intervention teachers reported a 14% improvement in their ability to regulate their emotions ($U3 = 0.64$), an 11% increase in their overall mindfulness ($U3 = 0.61$), a 7% reduction in their reported psychological distress ($U3 = 0.43$), and 8% reduction in their sense of time urgency ($U3 = 0.42$) as compared with controls (see Table 3). These findings replicate previous work that has shown significant positive effects on similar outcomes (Crain et al., 2016; Flook et al., 2013; Jennings et al., 2013; Kemeny et al., 2012; Roeser et al., 2013; Taylor et al., 2016a, 2016b).

In addition to examining effects on the five broad domains of teacher-reported functioning, post hoc analyses on the psychological distress factor showed significant intervention effects on sleep disturbances (10% reduction; $U3 = 0.60$) and emotional exhaustion (9% reduction; $U3 = 0.41$; see Table 6). These results align with the results of the SMART program that found improvements in sleep and mood (Crain et al., 2016). Sleep problems have been negatively associated with well-being, job performance, and mental and physical health (Kuppermann et al., 1995). Emotional exhaustion, one dimension of occupational burnout (Maslach, Jackson, & Leiter, 1997), has also been negatively related to job performance, workplace satisfaction, teaching efficacy, and turnover (Collie, Shapka, & Perry, 2012; Klassen & Chiu, 2010; Wright & Cropanzano, 1998).

Table 5
CARE for Teachers Impacts on Quality of Classroom Interactions

Quality of classroom interactions	Estimate	*SE*	*t*	*p*	Effect size	U3	Improvement index %
Emotional support	.17	.08	1.96	.051*	.22	.59	8.71
Positive climate	.23	.11	2.15	.031*	.23	.59	9.10
Negative climate	.10	.06	1.53	.125	.17	.57	6.75
Teacher sensitivity	.23	.12	1.99	.046*	.23	.59	9.10
Respect for student perspective	.07	.11	0.67	.502	.08	.53	3.19
Classroom organization	.17	.10	1.68	.093	.19	.58	7.53
Behavior management	.13	.12	1.13	.258	.13	.55	5.17
Productivity	.22	.11	1.94	.052*	.23	.59	9.10
Instructional learning formats	.13	.11	1.23	.218	.14	.56	5.57
Instructional support	.00	.08	−0.03	.974	.00	.50	0.00
Concept development	−.03	.08	−0.36	.178	−.05	.48	−1.99
Quality of feedback	.07	.10	0.71	.478	.08	.53	3.19
Language modeling	−.07	.09	−0.80	.425	−.10	.46	−3.98

* $p < .05$.

Post hoc analyses revealed that the positive impacts on the broad construct of time urgency were due to significantly lower levels of speech- and task-related hurry. Intervention teachers reported a 7% reduction on the subscale of speech-related hurry (U3 = 0.43) and a 9% reduction in task-related hurry (*U3* = 0.41). The CARE for Teachers program applies mindful awareness practices to help teachers slow down their behavioral and thought patterns to gain a more realistic view of the time they have available for certain lessons and academic goals and to prioritize and plan accordingly. A reduction in time pressure may also lead to reporting less stress and exhaustion.

Intervention teachers reported a substantial 14% improvement (*U3* = 0.64) in adaptive emotion regulation compared with controls. This finding aligns with research that identified improved emotion regulation as a key to preventing teacher stress (Montgomery & Rupp, 2005). Adaptive emotion regulation involves both the ability to closely examine situations in which teachers experience difficult emotions and to be able to engage in cognitive reappraisal as well as to less often suppress their emotional expression. This finding is particularly important because CARE for Teachers specifically instructs teachers in how to recognize the physical sensations associated with the onset of emotion reactivity and to use mindful awareness practices and cognitive reappraisal to improve emotional self-regulation in the context of classroom. Emotion expression suppression has been shown to increase stress and impair well-being (Gross, 2002). It appears that CARE for Teachers supports teachers to use more adaptive ways of regulating, expressing, and coping with difficult emotions in the classroom.

Post hoc analyses of the intervention effects on mindfulness indicated significant improvements in the observing and nonjudging subscales of the mindfulness factor. CARE for Teachers par-

Table 6
CARE for Teachers Impacts on Subscales Within Aggregate Factors Showing Significant Effects

Subscales within aggregate factors	Estimate	*SE*	*t*	*p*	Effect size	U3	Improvement index %
Mindfulness	.13	.05	2.71	.007*	.28	.61	11.03
Describing	.10	.07	1.42	.155	.15	.56	5.96
Nonjudging	.17	.08	2.04	.041*	.21	.58	8.32
Awareness	.06	.07	0.83	.409	.08	.53	3.19
Observing	.29	.08	3.46	.001*	.41	.66	15.91
Nonreactive	.09	.08	1.11	.267	.15	.56	5.96
Interpersonal mindfulness	.10	.06	1.65	.100	.19	.58	7.53
Psychological distress	−.13	.06	−1.99	.047*	−.18	.43	−7.14
Depression	−.04	.06	−0.67	.503	−.07	.47	−2.79
Anxiety	−.10	.08	−1.15	.249	−.13	.45	−5.17
Negative affect	−.13	.09	−1.52	.130	−.16	.44	−6.36
Sleep disturbance	.24	.11	2.25	.024*	.26	.60	10.26
Emotional exhaustion	−.32	.15	−2.08	.037*	−.22	.41	−8.71
Perceived stress	−.17	.09	−1.82	.070	−.22	.41	−8.71
Time urgency	−.10	.04	−2.32	.020*	−.20	.42	−7.93
Hurried eating	−.09	.08	−1.06	.290	−.10	.46	−3.98
Speech-related hurry	−.14	.06	−2.21	.027*	−.18	.43	−7.14
General hurry	−.05	.10	−0.49	.627	−.05	.48	−1.99
Task-related hurry	−.14	.07	−2.07	.038*	−.22	.41	−8.71
Competitiveness	−.10	.06	−1.74	.082	−.16	.44	−6.36

* $p < .05$.

ticipants reported a substantial 16% improvement on the observing scale ($U3 = 0.66$) and an 8% improvement on the nonjudging subscale ($U3 = 0.58$). Together, these two dimensions of mindfulness may be particularly important for teachers. When a teacher can observe internal and external experiences with a nonjudgmental attitude, he or she may be better prepared to respond to classroom situations without making maladaptive attributions to events (e.g., perceiving student misbehavior as a personal affront). In this way, increases in mindfulness may support teachers' ability to reappraise emotionally provocative situations, reduce or prevent overreactions and feelings of burnout (Chang, 2009) and promote supportive classroom interactions (Roeser, 2016; Roeser, Skinner, Beers, & Jennings, 2012; Skinner & Beers, 2016).

It was somewhat surprising given the above findings that CARE teachers did not report higher levels of teaching efficacy compared with control teachers. It should be noted that in a previous study, CARE for Teachers demonstrated significant effects on teaching efficacy (Jennings et al., 2013). One factor that might explain this lack of replication is that baseline scores on teaching efficacy in the current sample were approximately one standard deviation higher than scores among teachers in the prior sample; thus, ceiling effects may have limited our capacity to detect significant intervention effects in this study.

Impact on classrooms. Compared with control teachers, intervention teachers provided higher levels of emotional support as observed by independent raters using the CLASS. Again, although significant, the effect was modest. On average, the intervention participants' CLASS scores improved by 9% on emotional support ($U3 = 0.59$; see Table 5). Within the emotional support domain, the performance dimensions of positive climate and teacher sensitivity both improved by 9% from pre to post ($U3 = 0.59$).

As reported by other investigators (Rivers, Brackett, Reyes, Elbertson, & Salovey, 2013), we found that teachers randomly assigned to the control group showed declines in emotional support from the beginning to the end of the school year. In contrast, the intervention showed a protective effect against this decline, with teachers trained in CARE for Teachers showing stable levels of classroom emotional support from pretest to posttest. The intervention showed similar protective effects for the positive climate dimension of emotional support, which reflects teachers' warmth, closeness and respect for students. The improvements in teacher's social and emotional competences may have contributed to this protective effect. When teachers experience less psychological distress, they are more likely to express positive emotions like smiling and laughter which promotes a supportive, positive climate (Pianta et al., 2008). In contrast to the above protective effects, the teacher sensitivity dimension of emotional support demonstrated statistically significant increases in the intervention group at post compared with a decline among controls. Teacher sensitivity reflects teachers' awareness and responsiveness to students' needs. Mindfulness, particularly the observing and nonjudging dimensions, may improve a teacher's ability to notice and respond to students' needs with more patience and understanding.

Although marginally statistically significant, an intervention effect was found on the domain of classroom organization, as evidenced by an 8% improvement ($U3 = 0.57$), with a statistically significant gain on the dimension of productivity (9% improvement, $U3 = 0.59$). Productivity represents how smoothly the classroom runs and how teachers maximize learning time. Improvements in productivity may result from the decreased time pressure CARE teachers reported. When teachers feel less pressure to meet daily and weekly goals, they may be better prepared and implement lesson plans effectively. Although these results are similar to those of a pilot study that showed improvements in classroom organization (Flook et al., 2013), the results here include a larger sample of teachers and use of more rigorous methods.

These findings are notable in that they are the first to demonstrate improvements in classroom interactions as a result of intervention efforts that do not explicitly focus on teachers' classroom management and instruction skills. In contrast to one widely used teacher coaching program that focuses on developing teacher's interactional skills with students based on CLASS dimensions (My Teaching Partner; Allen, Pianta, Gregory, Mikami, & Lun, 2011), CARE for Teachers primarily targets teachers' own social and emotional competencies through emotion skills instruction and mindful awareness practices. Explicit instruction in ways to promote teachers' emotional supportiveness and classroom organization is not part of the CARE for Teachers curriculum. However, following the prosocial classroom model improvements on these CLASS outcomes were hypothesized to follow from improvements in aspects of teacher social and emotional competences.

These demonstrated improvements at both the teacher and classroom levels provide support for key components of the CARE for Teachers logic model and the prosocial classroom model (Jennings & Greenberg, 2009) described above. They are also consistent with the theoretical model proposed by Roeser et al. (2012), Roeser (2016), and Skinner and Beers (2016) wherein mindfulness training promotes improved emotion regulation and coping which then leads to reductions in stress, burnout and distress, and increased energy and self-regulatory resources that can be invested in improving classroom interactions that support student learning.

Contextualization of Current Study Within Existing Evidence Base

Although the results of the current study are promising, it is useful to situate these findings within the context of prior research on teacher mindfulness. The present study has some notable methodological differences compared with prior studies. First, the present trial included a sample of 224 teachers which is substantially larger than any prior randomized trials examining the efficacy of teacher mindfulness programs conducted by Beshai et al. (2016; $n = 89$), Flook et al. (2013, $n = 18$), Franco et al. (2010; $n = 36$), Frank et al. (2015; $n = 68$), Poulin et al. (2008; $n = 44$), Taylor et al., 2016a, 2016b; $n = 56$), and Jennings et al. (2013, $n = 50$). Although these pilot investigations are critical for determining the feasibility and parameters of larger scale trial designs, estimates of effect size (d) become more precise in larger sample sizes (Leon, Davis, & Kraemer, 2011). As such, the present study provides a unique contribution to the literature in terms of the size, diversity, and scope of the population studied.

Second, the present study provided in-service to educators working in public school settings, as compared with teacher mindfulness studies that have examined outcomes for teacher trainees (Hue & Lau, 2015), teacher-assistant dyads (Gold et al., 2010), or parent-teacher dyads (Benn et al., 2012). Therefore, our study

results generalize to the common configuration of teacher-led elementary classrooms in diverse inner city settings.

Among randomized trials of a similar size and focus, the trial of SMART trial is most directly comparable (Roeser et al., 2013). Although both studies utilized similar measures, measurement strategies differed in important ways. For example, in the present study, emotional exhaustion, one factor of burnout, loaded on a broader aggregate factor of psychological distress, whereas the Roeser study combined the three subscales of the Maslach Burnout Inventory into a global measure of burnout. Roeser et al. (2013) found the SMART program significantly decreased teacher-reported levels of occupational stress ($d = -0.57$), burnout ($d = -0.76$), anxiety ($d = -0.71$), and depression ($d = -1.06$), whereas we found smaller effects for the emotional exhaustion component of burnout ($d = -0.22$) and no differences in anxiety or depression, despite significant differences in the aggregate of teacher psychological distress ($d = -0.18$). There may be several possible explanations for these somewhat discrepant findings. In terms of study sample characteristics, Roeser et al. (2013) utilized a sample of 113 elementary and secondary school teachers from Canada and the United States, whereas the current study sampled exclusively from inner city elementary level teachers in the United States. Although both studies had high levels of female participation (93% CARE for Teachers vs. 88% SMART), the present study sample had substantially more racial diversity (33% White) as compared with the Roeser et al. (2013) Canadian (67% White) and U.S. sample (93% White).

Aside from variations in sample demographic characteristics, other features related to the nature of implementation and measurement are other possible explanations for differences in observed outcomes. For example, in the present study CARE for Teachers was delivered during five in-service training days (30 contact hours) spread out across the entire school year, with baseline data collection occurring in fall and posttest collection in spring. In contrast, the SMART program implemented by Roeser et al. (2013) occurred during an 8-week period (11 afterschool sessions, 36 contact hours) during the spring semester, with baseline data collection occurring in February–March and posttest data collection in June. Although the total contact hours of these programs were quite similar, they differed with regards to the format (in-service vs. afterschool), number of sessions (five vs. 11), session duration (6 hr vs. 3–4 hr), and the timing of sessions during the school year (five sessions across the whole year vs. eight weeks during one semester only).

Study Strengths

The present study marks a promising step forward in the evaluation of MBIs for teachers. Among its strengths, it is the largest randomized controlled trial of a MBI for teachers to date and also the first to use both a randomized experimental design and accompanying analytic strategy that accounted for the clustering of teachers/classrooms within schools. Second, the trial showed effects on both teacher-self reports as well as independently observed outcomes and thus support the potential veracity of teacher reports. It is also the first rigorous trial of a MBI designed for teachers to demonstrate positive impacts on key aspects of the observed quality of classroom interactions. As such, it is the first demonstration that a MBI can have direct impacts on distal contextual factors that reflect positive social interactions. Another strength of the study is that the sample of teachers is racially and ethnically diverse (66.6% non-White) and the sample of classrooms observed covers the entire span of the elementary school grades (K-5).

Limitations

The present study had several limitations. The sample of schools and teachers participated in the study and the CARE for Teachers program voluntarily. For this reason, the results of the present study might not be generalizable to a sample of teachers mandated to participate in the program. Although CARE for Teachers demonstrated direct effects on four of five hypothesized teacher self-report factors and important dimensions of classroom interaction quality, these effects are small to moderate in magnitude. Another limitation is that this report only examined pre- and postintervention changes. It is likely that reductions in teachers' psychological distress and improvements in teachers' social and emotional competence and the quality of classroom interactions may change over time. Improvements could fade away in the absence of the intervention, or they may be augmented as teachers have more time to further develop their mindfulness and emotion skills to integrate them more comprehensively into their teaching practices and daily lives. The SMART program found continued improvement in mindfulness and occupational self-compassion and reductions in occupational stress, burnout, anxiety, and depression symptoms at 3-month follow-up (Roeser et al., 2013). Another report involving the same sample found continued reductions in bad mood at the 3-month follow up but also improvement in sleep quality which was not found immediately postintervention (Crain et al., 2016).

Suggestions for Future Research

Although the present study represents a promising advancement in the evaluation of MBIs for teachers and MBIs more generally, there is a need for further research to gain a more comprehensive understanding of the impact of MBIs on teacher, classroom and student outcomes. Understanding how geographic locale, grade level, and racial diversity may moderate the effectiveness of MBIs for teachers is an important area for future research. Furthermore, CARE for Teachers was delivered over 30 hr across 5 days and it will be important to study how variations in the intensity and duration of the program may be related to teacher outcomes. Reducing the time and intensity of the program, if findings were still positive, may affect the likelihood of school's adopting CARE for Teachers as an ongoing professional development program for all teachers within a school.

The improvements in dimensions in classroom interactions suggest that CARE for Teachers may improve student academic and behavioral outcomes not addressed in the present study but hypothesized in the prosocial classroom model (Jennings & Greenberg, 2009). Previous research has demonstrated that similar improvements in classroom emotional supportiveness and organization result in improvements in student-teacher relationships and student academic (Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008) and behavioral outcomes (Hamre & Pianta, 2005; Hoglund et al., 2015). Future research should examine student outcomes in relation to improvements in teacher and classroom outcomes.

MBIs for teachers may be most useful as a complement to social and emotional learning programs for students. Despite the modest effects found in the present study, such effect sizes are not uncommon in educational research (Hill, Bloom, Black, & Lipsey, 2008; Wilson, Lipsey, & Derzon, 2003). Combining such programs may have synergistic effects that boost the impacts of both programs.

Finally, cost–benefit analyses of programs such as CARE for Teachers and SMART could add to such programs' perceived value among school leaders and policymakers. Previous work has shown that MBIs may impact physical health in adult populations. In future studies, physiological measures (cortisol, blood pressure, immune function, etc.) could be assessed to examine effects on underlying physiological systems. In addition, it would be useful to assess teacher's health care utilization through study of insurance records as positive findings related to reductions in health care costs would be notable to school leaders and education policymakers.

Study Implications

Teacher stress and burnout is a critical issue in today's educational landscape, and only limited attention in policy and teacher training programs has been given to the matter (Greenberg et al., 2016). The results suggest that efforts to foster teachers' social and emotional competences may have significant impacts on both the cost and quality of education. In the long run, reducing teacher stress and burnout may reduce costs associated with teacher absenteeism, turnover, and health care, as well as lead to gains in classroom interaction quality and supportive teacher-student relationships that promote student positive social and emotional and academic development. The present study demonstrated CARE for Teachers to be a socially valid and well-received professional development program that can support the aforementioned goals.

In conclusion, this study provides the most rigorous evidence to date for the efficacy of a MBI to increase teacher social and emotional competence and the quality of classroom interactions. Additional research is needed to investigate whether this program shows longer-term effects on teachers and whether it is scalable to whole school or district-wide implementation.

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