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Long-term impacts of the CARE program on teachers' self-reported social and emotional competence and well-being☆

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ABSTRACT

Teacher stress is at an all-time high, negatively impacting the quality of education and student outcomes. In recent years, mindfulness-based interventions have been shown to promote well-being and reduce stress among healthy adults. In particular, mindfulness-based interventions enhance emotion regulation and reduce psychological distress. One such program specifically designed to address teacher stress is Cultivating Awareness and Resilience in Education (CARE). The present study examined teachers' self-reported data collected at three time points over two consecutive school years as part of a randomized controlled trial of CARE. The study involved 224 teachers in 36 elementary schools in high poverty areas of New York City. Teachers were randomly assigned within schools to receive CARE or to a waitlist control group. This study builds on previous experimental evidence of the impacts of CARE on teacher self-reported outcomes for this sample of teachers within one school year (Jennings et al., 2017). Results indicate that at the third assessment point (9.5 months after participating in the program), CARE teachers showed continued significant decreases in psychological distress, reductions in ache-related physical distress, continued significant increases in emotion regulation and some dimensions of mindfulness. Findings indicate that teachers who participated in mindfulness-based professional development through CARE reported both sustained and new

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benefits regarding their well-being at a follow-up assessment almost one-year post-intervention compared to teachers in the control condition. Implications for further research and policy are discussed.

1. Introduction

Teachers play a critical role in educating our nation's children and adolescents. They are tasked with creating and maintaining supportive learning environments, managing challenging student behavior and providing quality instruction within an uncertain and unpredictable context. Today, increasing levels of stress among teachers is impacting their health and well-being causing burnout, poor performance, growing turnover rates and negatively impacting the quality of education and student learning (Greenberg, Brown, & Abenavoli, 2016; Hoglund, Klingle, & Hosan, 2015; Kyriacou, 2011; von der Embse, Pendergast, Segool, Saeki, & Ryan, 2016). Many urban teachers report high levels of occupational stress due to the challenges they face including overcrowded classrooms, limited resources, students with chronic disruptive behavior and the demands of high-stakes accountability measures (Haynes, Maddock, & Goldrick, 2014; Shernoff, Mehta, Atkins, Torf, & Spencer, 2011). Research indicates that teacher stress has direct negative impacts on students' well-being (Milkie & Warner, 2011; Oberle & Schonert-Reichl, 2016), especially in urban high-need schools (Johnson, Kraft, & Papay, 2012).

Applying a systems approach to this issue, Jennings, Minnici, and Yoder (2019) reviewed the causes of teacher stress and ways to address them. They found that both organizational structures (school organization, job demands, and work resources) and individual level skills and competencies (teachers' social and emotional competencies to cope with occupational stress) impact stress levels of teachers and how teachers manage daily stressors. The present study focuses on the latter by examining the efficacy of a professional learning intervention designed to promote teachers' social and emotional competence (SEC).

When teachers lack the SEC to manage these high job demands, teacher performance diminishes and attrition rises (Montgomery & Rupp, 2005). Teacher SEC is defined in terms of the five competencies outlined by the Collaborative for Academic, Social and Emotional Learning (CASEL, 2019), e.g., self-awareness, self-management, social awareness, relationships skills and responsible decision-making. SEC is critical for teachers' successful classroom management, building supportive relationships with students, and teaching and modeling social and emotional skills to students (Jennings & Greenberg, 2009; Jones, Brown, & Aber, 2008). If teachers lack these competencies and cannot manage their occupational stress, their job performance will suffer along with their students' learning and well-being (Li Grining et al., 2010). Teachers' well-being can also impact the quality of the interactions in their classroom (Jennings, 2015; McLean & Connor, 2015). In contrast, teachers with high levels of SEC are aware of their emotions and emotional patterns and can manage their strong emotions, even when faced with challenging classroom situations. They know how to build strong, supportive relationships with their students and understand and can orchestrate positive social dynamics in the classroom. When making decisions, they reflect on how their decision may impact everyone involved and how to best support the needs of their students (Jennings & Greenberg, 2009).

Among the interventions developed to promote these skills, the approaches with the most promising evidence are workplace wellness programs, social and emotional learning programs that include professional learning for teachers, and mindfulness-based interventions (MBIs) (Jennings et al., 2019). While research is limited, there is initial evidence that engagement in workplace wellness programs improve physical and mental health of teachers (Lawrence, 2016; Merrill & Sloan, 2014); however, more research is needed to understand the influence such programs have on teacher stress, the promotion of SEC, and improvements in classroom interactions.

Researchers are beginning to recognize the importance of adult SEC in the implementation of SEL programs for students as teachers are important models of the SEC these programs aim to teach (Jennings & Frank, 2015). SEL programs have been found effective for promoting student outcomes such as SEC, positive attitudes, prosocial behaviors, and academic achievement, and decreasing negative attitudes and behaviors (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). In addition, some studies have found that teachers trained to deliver SEL programs report reduced anxiety and depression (Tyson, Roberts, & Kane, 2009), improved teacher engagement (Castillo-Gualda, Herrero, Rodríguez-Carvajal, Brackett, & Fernández-Berrocal, 2018), perceived job control (Zhai, Raver, & Li-Grining, 2011) and efficacy (Domitrovich et al., 2016).

1.1. Mindfulness-based interventions to promote teacher social and emotional competence

Another approach for reducing teachers' stress and promoting social and emotional competence is participation in mindfulness-based interventions (commonly referred to as MBIs). Mindfulness has been conceptualized as involving two primary processes: (a) the direction of one's attention to the present moment, and (b) the cultivation of a curious, open and accepting orientation toward one's experience (Bishop et al., 2004). One can cultivate mindfulness by engaging in a variety of formal practices including meditation, yoga, tai chi and qigong. Mindfulness can also be practiced informally by bringing present centered awareness to any task or experience, such as listening, eating and walking (Williams & Kabat-Zinn, 2011).

Research examining the efficacy of MBIs to promote well-being and reduce stress has grown considerably over the past 20 years. Reviews of research focused on general stress management with non-clinical adult populations suggest positive effects of MBIs (Pascoe, Thompson, & Ski, 2017). Examining effects of MBIs on occupational stress, Good et al. (2016) conducted a systematic review of the literature and found evidence that the mindfulness is associated with key dimensions of optimum occupational functioning.

They presented a theoretical framework to explain how MBIs promote attentional stability, control and efficiency. They proposed that these improvements in attentional functioning mediate improvements in cognitive, emotional, behavioral and physiological functioning associated with optimal work performance. This research suggests support for mindfulness as a possible intervention approach to address the specific emotional stressors teachers face (Jennings & Greenberg, 2009).

While extensive research has demonstrated positive impacts of MBIs immediately post-intervention, relatively few studies have examined whether short-term positive impacts are sustained over time. Meta-analyses provide evidence that reductions in depression and anxiety may continue over 3–6 months in clinical samples (Goyal et al., 2014; Hofmann, Sawyer, Witt, & Oh, 2010). However, evidence for longer-term effects on clinical populations is mixed. Some studies have shown sustained effects on mental distress and coping over two years (Chien & Thompson, 2014; Meadows et al., 2014). However, other research has demonstrated a general reduction of impacts over 1–2 years (de Vibe et al., 2017; Fjorback et al., 2013; Henderson et al., 2012). A few studies of MBIs of non-clinical samples involving follow-up periods of one year demonstrated sustained positive effects on positive psychological outcomes but not stress (Amutio, Martinez-Taboada, Hermosilla, & Delgado, 2015; Malarkey, Jarjoura, & Klatt, 2013). Solhaug et al. (2019) examined the impact of the Mindfulness-Based Stress Reduction (MBSR) program at four years post-intervention and found that the positive impacts of MBSR on mental distress, mindfulness, avoidance-focused coping and problem-focused coping observed 1-month post-intervention (de Vibe et al., 2013; Halland et al., 2015) persisted at 4-year follow-up.

Recently there has been a rapid growth of mindfulness-based interventions for teachers (Emerson et al., 2017) and evidence of these programs' promise is encouraging (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; Jennings et al., 2017; Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013; Roeser et al., 2013). However, the knowledge base on efficacy is often limited by small samples and inadequately powered designs to account for between-school effects. Additionally, they offer assessment of only short-term outcomes and point-in-time impact estimates rather than estimates of intervention-induced change over multiple time points. Furthermore, no studies to date assessing MBI-induced changes in developmental trajectories of teachers have examined impacts over more three months (Crain, Schonert-Reichl, & Roeser, 2017). Developing effective ways to support teachers' well-being over the long term is critical to maintaining a high performing teacher workforce. In response to this need, the current study examined the longitudinal impact of the Cultivating Awareness and Resilience in Education (CARE) professional development program at two time points post intervention.

1.2. CARE professional development

CARE is an MBI designed to promote the social and emotional competence teachers need to manage stress and promote positive classroom interactions and student learning. The CARE program is a comprehensive adult learning model that combines emotion skills instruction and mindful awareness and compassion practices taught sequentially over 30 h (five 6-hour days) delivered across the course of a school year. Several features of the program were intended to help maintain treatment effects. The high intensity of the program delivered over several months and the intersession individualized coaching and activities were intended to help teachers apply learning to their teaching and individualize a sustainable self-care program. Program activities included didactic and experiential practices to promote emotional awareness and emotion regulation in the context of the classroom, mindful awareness of breath, body, and emotion, mindful walking and stretching, and listening and caring practices (Jennings, 2016).

The CARE logic model (Fig. 1) proposes that the program has direct positive impacts on teachers' adaptive emotion regulation, teaching efficacy, mindfulness, psychological distress, physical distress, the quality of classroom emotional support and organization, and student learning behaviors. Furthermore, the model proposes that the program has direct and indirect impacts on student academic and social and emotional skills. The present study examines the impact of CARE on self-reported teacher outcomes over the course of a year.

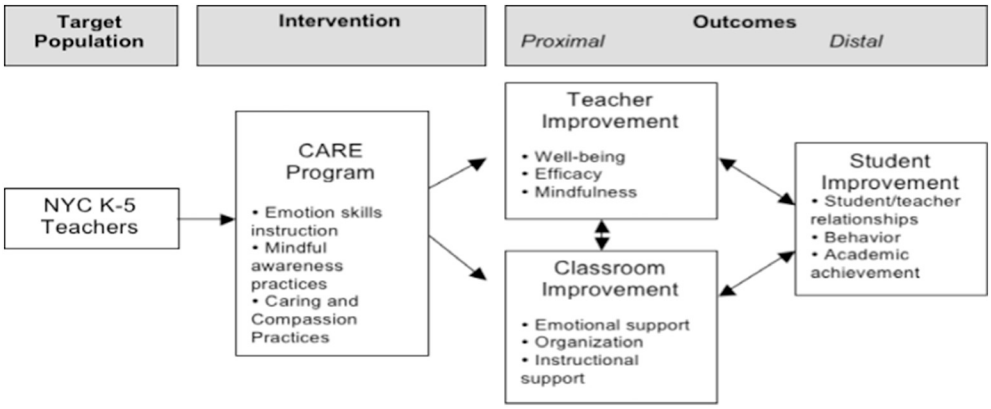

Fig. 1. CARE logic model.

1.3. Short-term impacts of CARE

The program's efficacy to impact teacher outcomes and classroom interactions was examined by Jennings et al. (2017) in a large randomized controlled trial. Teachers (n = 224) were randomly assigned within schools (n = 36) to receive the CARE program or to a waitlist control condition. Compared to teachers assigned to the control condition, they found teachers who received CARE reported significant reductions in psychological distress and time urgency, and significant increases in adaptive emotion regulation and mindfulness. No intervention effect was found on efficacy; however, baseline scores were high likely demonstrating ceiling effects. No significant intervention impacts were found for measures of physical distress (e.g., physical symptoms or medication use). Further, classrooms were observed and rated using a standardized measure of classroom interaction quality, the *Classroom Assessment Scoring System* (*K-3*) (CLASS; Pianta, La Paro, & Hamre, 2008). For classrooms of teachers who received the CARE program, interaction quality was rated as higher in emotional support (teacher sensitivity and positive emotional climate) and time for learning (e.g., productivity) when compared with control classrooms (Jennings et al., 2017).

1.4. Current study

Using data from the same sample described above, the current study examined teacher self-report data collected at three time points over the course of one year (fall-spring-fall) to determine long-term impacts of CARE on teachers' emotion regulation, mindfulness, psychological distress and time urgency. Classroom observation data was not collected at the third time point and therefore long-term impacts on these data could not be examined in the current study. The current study aimed to explore whether the positive impacts of CARE on adaptive emotion regulation, mindfulness, psychological distress and time urgency would continue over the course of one year. The study also aimed to explore whether there were changes in physical health over this time period. Further, this study explored whether CARE had a greater impact on teachers with higher levels of psychological distress at baseline.

2. Method

2.1. Procedures

2.1.1. Recruitment

School recruitment took place in spring of 2012 (Cohort 1) and 2013 (Cohort 2) among New York City public K-5 elementary schools located in high poverty areas of the Bronx and Upper Manhattan. Schools in these areas were chosen because results from a previous study of CARE suggested teachers working in such school contexts especially benefited from the program (Jennings, Snowberg, Coccia, & Greenberg, 2011). Schools were initially recruited by approaching principals. Subsequently, principals in each participating school agreed to: support enrollment and participation of at least four teachers, facilitate scheduling of research activities, and support distribution of study information to parents. Principals also agreed to release teachers for professional development days and to cover the cost of a substitute for one training day. The study enrolled 36 (49%) of the schools approached.

Teachers were identified for participation based on the following criteria: K-5, general education, lead teacher in the classroom, taught the same students for the entirety of the school day, and had classrooms that were not gender segregated. Of the 1084 teachers assessed, 525 (48%) were found to be eligible.[6]

2.1.2. Sample

Of eligible teachers, 224 teachers (43%) chose to participate; there was a median participation rate of six teachers per school (range = 2–10). Table 1 displays teacher and classroom characteristics. The first cohort included 53 teachers from eight schools. The second cohort consisted of 171 teachers from an additional 28 schools. The majority of participants were female (93%) with a median age of 40 (range = 22–73). Participants were ethnically and racially diverse: 33% White, 31% Hispanic, 26% African American/Black, 5% Asian, and 5% mixed racial background. Almost all teachers in this sample had a Master's/Specialist degree or higher (96%). Teachers reported an average of 12.5 years of experience (range = 0 to 32 years). Active consent was obtained from teachers in accordance with both the University's and district's Institutional Review Board procedures.

Teachers were distributed across the elementary grades: 17% Kindergarten, 18% 1st grade, 15% 2nd grade, 16% 3rd grade, 15% 4th grade, 18% 5th grade, and 1% in blended grade classrooms (K-1, 2–3 and 3–4 combo). The majority were general education teachers (85%); 13% endorsed teaching in combined language (bilingual, ESL, ELL or dual) classes, and 2% reported teaching in a special education inclusion classroom alone as a general education teacher (e.g., not co-teaching with a special education teacher).[7] On average, teacher classrooms contained 24 students (range = 13–33).

All participating schools were considered high poverty schools since > 75% of students qualified to receive free or reduced price lunch (Glander, 2015). On average these schools enrolled 628 students (SD = 228 range = 302–1225) and were located in

[6] A CONSORT flow diagram representing status of the sample through the phases of the randomized controlled trial and follow-up assessment and a table reporting on participant attrition are provided in the online supplement in Fig. S1 and Table S1, respectively.

[7] At the time of recruitment, the New York City schools were beginning to transition to a new model intended to support efforts to include students with disabilities in the general education classrooms by assigning special education teachers as co-teachers with general education teachers. The limitations of our research design did not allow us to include teachers working in classrooms with a co-teacher.

Table 1
Teacher and classroom characteristics by intervention and control status.

	Total (n = 224)			Intervention (n = 118)			Control (n = 106)		
	Valid n	%	Mean (SD)	Valid n	%	Mean (SD)	Valid n	%	Mean (SD)
Cohort	224			118			106		
Cohort 1		23.7			22.0			25.0	
Cohort 2		76.3			78.0			75.0	
Race/ethnicity	224			118			106		
White		33.4			34.8			31.1	
Non-White		66.6			65.2			68.9	
Grade level	221			116			105		
Grade K-3		67.0			62.1			72.4	
Grade 4–5		33.0			37.9			27.6	
Proportion of IEP students	224		0.10 (0.09)	118		0.10 (0.09)	106		0.10 (0.09)
Student-teacher ratio	224		17.89 (5.26)	118		17.81 (5.38)	106		17.99 (5.16)
Class type	224			118			106		
General ed		84.4			83.1			85.9	
Others		15.7			16.9			14.1	
Proportion of suspended	205		0.03 (0.07)	107		0.04 (0.08)	98		0.02 (0.04)
Avg. learning support at home	214		3.56 (0.53)	112		3.58 (0.49)	102		3.53 (0.57)

Manhattan (n = 25) or the Bronx (n = 11). Although the study only recruited from K-5 classrooms, 13 of the 36 participating schools were either K-6 or K-8.

2.1.3. Randomization

The RCT used a 2-level (teachers/classrooms, schools) multi-site cluster randomized trial design with intervention at level 2 (teachers) and schools serving as naturally occurring blocks (Jennings et al., 2017). After baseline data collection, teachers were randomized to CARE or waitlist control by school and grade for each cohort. A block randomization method was employed to ensure groups of approximately equal sample size within schools. 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). In this RCT, the CARE program was entirely focused on a limited number of teachers and did not assume impacts common to whole school curriculum implementation. Although randomizing teachers within schools posed a potential threat to the study's internal validity due to possible contamination effects from intervention to control group teachers within a school, within school randomization was still preferable as potential contamination was expected to be unlikely. The impact of teachers sharing CARE activities with their colleagues assigned to the control group was considered to be negligible due to the extensive training time and the effect sizes found in previous research. Consequently, the risk of contamination was expected to be well below the approximately 50% threshold at or beyond which random assignment of schools, rather than teachers within schools, would be preferred (Rhoads, 2011).

Teachers assigned to the intervention condition received the CARE program in the fall/winter of 2012–2013 for Cohort 1 (C1) and 2013–2014 for Cohort 2 (C2) immediately following initial data collection and randomization. Teachers in the wait-list control condition received standard professional development activities as assigned by their schools for the first school year and were offered CARE in the spring of the following school year after all data collection was complete. With the exception of time spent in professional development related to stress reduction, mindfulness, or other meditative activities (e.g., CARE), no statistically significant differences were found between treatment and control groups on amount of other forms of professional development (i.e., curriculum/academic instruction, student/classroom behavior, and social and emotional learning) received during the intervention school year.

2.1.4. CARE program delivery

CARE program implementations were provided over five six-hour session days (30 h total) between November and February. Each program was presented by a team of three facilitators who met requirements including a minimum of a master's degree, two years' experience with the program, and a personal mindfulness practice.

Almost all of the teachers (90%) attended at least four of the session days (M = 4.49). All participants received a workbook and audio recordings of mindful awareness practices to facilitate home practice. Teachers were offered a series of three one-on-one coaching phone calls during inter-session periods (DeWeese et al., 2017). Each participant was scheduled for three support calls over the course of program delivery following days two, three, and four; calls averaged 26 min (range = 9–60). Coaches were either

program facilitators or program fidelity coders familiar with the CARE program objectives. Coaches followed a scripted protocol designed as a semi-structured interview based in motivational interviewing (Miller & Rollnick, 2012) focused on three topics. The first call focused on how to establish a self-care practice. The second call focused on supporting teachers' maintenance of their practice and to apply their learning to challenging classroom situations. The third call focused on supporting teachers to sustain their practice and application of CARE skills and knowledge.

Teachers were compensated for 6 h of training for one weekend day at the district approved training rate of $19.12 an hour. Schools were compensated for substitute teachers for two program days that occurred during school hours; schools covered the cost for one day. There was no compensation for district professional development days.

Adherence to the curriculum and quality of the facilitation were monitored by a team of coders who had previously attended a CARE program and at least 4 h of coder training using fidelity observational tools (Doyle, Jennings, DeWeese, & Frank, 2014). During each program session, two trained coders observed and independently rated program facilitation. Coders were randomized across session days to minimize coder bias and codes were checked for reliability across coder pairs. Coding disagreements were resolved by consensus with help from the coding supervisor. Adherence was high with an average of 88% (range = 86–91%) of manualized facilitation activities completed. Learning objectives were completed at an adequate to exemplary level ($M = 3.43$, range = 3.29–3.65 on a 0–4 scale). Facilitation quality was also rated high ($M = 3.77$, range = 3.70–3.87 on a 0–4 scale). For more detail about the measures used to monitor the fidelity of implementation, please see Doyle et al. (2018).

2.2. Data collection

Teachers completed self-report measures prior to the intervention in fall and then twice post-intervention, once during the spring of the same school year and again in fall of the following school year. Each assessment wave, teachers completed measures to assess well-being, efficacy, burnout, time pressure, mindfulness, and physical health. Teachers were compensated at the district's rate for per session work hours ($42 per hour).

2.3. Measures

Measures were selected based on previous research (and other research on MBIs with teachers and other adult populations) and the proximal teacher improvement constructs of the CARE logic model shown in Fig. 1.

2.3.1. Psychological distress

Teachers' psychological distress was measured using six scales. The first measure was the 8-item Patient Health Questionnaire Depression Scale (PHQ-8) which measures depressive symptoms (e.g., “Feeling bad about yourself — or that you are a failure or have let yourself or your family down”) on a 4-point Likert-type scale (1 = *not at all* to 4 = *nearly every day*) (Kroenke et al., 2009). Coefficient alphas were 0.87 at each assessment point.

The second scale used was the 7-item Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). Teachers reported on generalized anxiety symptoms (e.g., “Not being able to stop or control worrying”) using a 4-point Likert type scale (1 = *not at all* to 4 = *nearly every day*). Coefficient alphas for the GAD-7 ranged from 0.92 to 0.93.

The third scale used was the 5-item Negative affect subscale from the International Positive and Negative Affect Rating Short Form (PANAS; Thompson, 2007). Teachers rated how they “felt during the past few weeks” on five emotions using a 5-point Likert-type scale (1 = *very little or not at all* to 5 = *extremely*). Coefficient alphas ranged from 0.75 to 0.92.

The fourth scale used was the 4-item Patient Reported Outcomes Measurement Information System Sleep Disturbance Questionnaire (PROMIS; Buysse et al., 2010). Teachers rated the quality of their sleep and sleep patterns over the past 7 days (e.g., “I had difficulty falling asleep”) on a 5-point Likert-type scale (1 = *not at all* to 5 = *very much*). The coefficient alphas for the PROMIS ranged from 0.85 to 0.87.

The fifth scale was the 9-item Emotional Exhaustion subscale of the Maslach Burnout Inventory-Educators' Survey (MBI-ES; Maslach, Jackson, & Leiter, 1996). Teachers reported on their level of burnout related to emotional exhaustion, (e.g., “I feel used up at the end of the work day.”) on a 7-point Likert-type scale (1 = *never* to 7 = *every day*). The coefficient alphas for the subscale were 0.91 at each assessment point.

The sixth scale used was the 4-item Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). Teachers rated how difficult it was to handle stressors over the last month (e.g., “how often have you felt that things were going your way?”) on a 5-point Likert-type scale (1 = *never* to 5 = *very often*). Coefficient alphas for the PSS ranged between 0.68 and 0.78.

2.3.2. Physical health

Two measures employing count variables assessed teachers' physical health. Unlike the scales above, these measured employed counts of specific symptoms and medications used, were not expected to correlate and therefore the coefficient alpha statistic is not reported here (Hoyle, 2012; Treiblmaier, Bentler, & Mair, 2011). Teachers completed the 5-item *gastrointestinal* (e.g., constipation, stomach problems) and 4-item *general aches* (e.g., joint pain, backaches) subscales of the Daily Physical Symptom Checklist (DPS; Larsen & Kasimatis, 1991). Participants indicated (yes/no) whether they experienced each symptom “today”; sum scores were created for each subscale. The second measure focused on medication use. Teachers indicated (yes/no) whether they were taking medications for 12 common conditions (e.g., hypertension, heart condition, hormone replacement). A *medication use* sum score was created.

2.3.3. Time pressure

All five subscales from the 33-item Time Urgency Scale were used (TUS; Landy, Rastegary, Thayer, & Colvin, 1991) to assess time pressure including: *speech patterns* (e.g., "When I listen to someone talking and this person takes too long to come to the point, I actually "put words in his mouth."), *eating behavior* (e.g., reverse item "I eat more slowly than most people."), *competitiveness* (e.g., I am hard driving.), *task-related hurry* (e.g., reverse item "I often work slowly and leisurely."), and *general hurry* (e.g., "I am usually pressed for time."). Teachers reported how much each statement described their behavior on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). The coefficient alphas for subscales ranged as indicated: *speech patterns*, 0.70–0.75; *eating behavior*, 0.83–0.85; *competitiveness*, 0.73–0.75; *general hurry*, 0.64–0.82; and *task-related hurry*, 0.54–0.77.

2.3.4. Efficacy

Three scales from the Teachers' Sense of Efficacy Questionnaire-Short Form, were used to assess teaching efficacy (TSES; Tschannen-Moran & Hoy, 2001). This 12-item measure covers the following dimensions: *efficacy in student engagement* (e.g., "How much can do to motivate students who show low interest in school work?"), *efficacy in classroom management* (e.g., "How much can you do to control disruptive behavior in the classroom?"), and *efficacy in instructional strategies* (e.g., "To what extent can you provide an alternative explanation or example when students are confused?"). Teachers rated items on a 9-point Likert scale (1 = *nothing* to 9 = *a great deal*). Coefficient alphas ranged as follows: efficacy for student engagement = 0.78–0.84, efficacy for classroom management = 0.83–0.88, and efficacy for instructional strategies = 0.85–0.89.

2.3.5. Mindfulness

Six subscales were used to assess mindfulness. The first five subscales came from the 39-item Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2008) and included: *observing* (e.g., "When I take a shower or bath, I stay alert to the sensations of water on my body."), *describing* (e.g., "I'm good at finding words to describe my feelings."), *acting with awareness* (e.g., reverse item: "When I do things, my mind wanders off and I'm easily distracted."), *nonjudgmental* (e.g., reverse item: "I criticize myself for having irrational or inappropriate emotions."), and *nonreactive* (e.g., "I perceive my feelings and emotions without having to react to them."). Teachers indicated the how often the statements were 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* = 0.83–0.85; *describing* = 0.87–0.91; *acting with awareness* = 0.89–0.93; *nonjudgmental* = 0.85–0.92; and *nonreactive* = 0.73–0.77.

Additionally, the 5-item interpersonal mindfulness subscale of the Mindfulness in Teaching Scale (MTS; Frank, Jennings, & Greenberg, 2016) was used. Items from this subscale are focused on mindfulness in classroom interactions (e.g., reverse item: "When I'm upset with my students, I notice how I am feeling before I take action."). Teachers indicated on a 5-point Likert-type scale how true each statement was for them (1 = *never true* to 5 = *always true*). The coefficient alpha ranged from 0.66 to 0.75.

2.3.6. Adaptive emotion regulation

Two scales from the 10-item Emotion Regulation Questionnaire were used to assess teachers' emotion regulation (ERQ; Gross & John, 2003). Teachers reported on questions related to *cognitive reappraisal* (e.g., "When I want to feel more positive emotion, I change the way I'm thinking about the situation.") and expressive *suppression* (e.g., "I keep my emotions to myself.") on a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*). The coefficient alphas ranged from 0.67 to 0.77.

2.4. Preliminary analyses[8]

2.4.1. Descriptive and distributional properties of sample

Distributions, outliers, multicollinearity, homogeneity of variance, and unusual patterns of missing data were examined first. 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 alphas at baseline were in the acceptable range (0.54–0.93). To determine whether the sample was normative, we examined scores on measures with published cut points for percentage of teachers scoring within a diagnostic range. At baseline, the PHQ-8 and the GAD-7 scores were examined to check for clinical levels of anxiety or depression in teachers; scores ranged from 1 to 4 with average means under the clinical threshold (M = 1.76 and 2.07 respectively).

2.4.2. Attrition and missing data

There were low rates of attrition between pre- and post-test and between post-test and follow-up (approximately 6.5% each); the attrition rate between pre-test and follow-up was 12.9% (12 control, 17 intervention). We used *t*-tests or *chi*-square tests to check comparability of teachers with missing data points and those with complete data on a number of background characteristics and pre-test measures. Our analyses indicated no significant differences. Examination of possible intervention by attrition interactions using two-way ANOVA and three-way *chi*-square tests also yielded no statistically significant differences on background characteristics and most pre-test variables except psychological distress ($F = 6.255$, $p < .05$), time urgency ($F = 6.842$, $p < .05$), and ache-related symptoms ($F = 4.522$, $p < .05$). The results indicated that for teachers in the control condition, attrition was significantly higher for those with higher baseline levels of psychological distress, time urgency, or ache-related symptoms. In addition, we conducted Little's

[8] A power analysis was published in the online supplementary materials from Jennings et al., 2017.

Table 2
Descriptive statistics for all outcome measures across three measurement occasions.

	CARE (n = 118)						Control (n = 106)					
	Pre		Post		Follow-up		Pre		Post		Follow-up	
Measure	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)
Teacher emotional well-being												
Mindfulness	3.55	(0.43)	3.68	(0.49)	3.66	(0.46)	3.55	(0.42)	3.56	(0.46)	3.57	(0.45)
Psychological distress	2.57	(0.73)	2.37	(0.71)	2.16	(0.66)	2.67	(0.76)	2.51	(0.70)	2.45	(0.71)
Time urgency	3.24	(0.53)	3.16	(0.50)	3.20	(0.49)	3.37	(0.53)	3.31	(0.49)	3.30	(0.50)
Efficacy	7.15	(0.94)	7.31	(0.93)	7.29	(1.02)	7.01	(1.03)	7.22	(0.98)	7.13	(1.09)
Adaptive emotion regulation	4.85	(0.70)	5.00	(0.70)	5.12	(0.70)	4.81	(0.71)	4.75	(0.68)	4.71	(0.84)
Teacher daily physical symptoms & medication												
Ache-related symptoms	1.27	(1.27)	0.97	(1.11)	0.76	(1.11)	1.17	(1.25)	1.11	(1.18)	1.00	(1.20)
Gastrointestinal symptoms	0.29	(0.74)	0.21	(0.58)	0.12	(0.38)	0.36	(0.72)	0.37	(0.81)	0.35	(0.92)
Sum of medication	1.03	(1.10)	1.00	(0.92)	0.83	(0.94)	1.22	(1.10)	1.18	(1.19)	1.15	(1.26)

missing completely at random (MCAR) test (Little, 1988) to evaluate the patterns of missing data. The MCAR tests resulted in non-significant chi-square statistics for all outcome measures, suggesting that missing data could be considered as missing at random. Given these results and that the analyses controlled for pretest measures, we handled missing data using the Full Information Maximum Likelihood (FIML) estimation method under the assumption that missing is at random (Little & Rubin, 2002).

2.4.3. Comparability of intervention and control groups

Table 2 summarizes teacher descriptive statistics by intervention and control status at each data collection phase. Analyses found no statistically significant differences in baseline demographic characteristics between conditions. Further, no differences were found between groups on baseline outcome measures even after controlling for multiple pairwise contrasts (Jennings et al., 2017). Thus, at baseline, randomization was effective in ensuring intervention and control groups were well balanced.

2.4.4. Data reduction of teacher self-report outcomes

Jennings et al. (2017) examination of the pre-test and post-test data used a data reduction strategy to reduce the number of tests performed on several self-report measures of teacher stress and well-being to the most theoretically and empirically relevant distinct underlying constructs. Scale-level correlations were examined and exploratory and confirmatory factor analyses were employed to identify the primary meaningful higher-order constructs. Teachers' physical symptoms and medication usage were excluded from these analyses because they could not be meaningfully grouped with any of the other higher-order constructs. The exploratory factor analysis extracted a set of five cohesive factor constructs utilizing maximum likelihood estimation with promax oblique rotation (Lorenzo-Seva & ten Berge, 2006)[9]; the same factors were used for follow-up analyses.

The *Mindfulness* factor included all five subscales from the Five Facet Mindfulness Questionnaire and the interpersonal mindfulness scale from the Interpersonal Mindfulness in Teaching Scale. The *Psychological Distress* factor consisted of scales for depression, anxiety, negative affect, sleep disturbance, emotional exhaustion, and perceived stress. The *Time Urgency* factor consisted of all five subscales from the Time Urgency Scale. The fourth factor, *Teaching Efficacy*, included all three subscales Teacher Self-Efficacy Scale. Cronbach's alphas ranged from 0.68 to 0.78 for *Mindfulness*, 0.62–0.84 for *Psychological Distress*, 0.63–0.70 for *Time Urgency*, and 0.84–0.88 for *Teaching Efficacy*. Additionally a factor for adaptive *Emotion Regulation* was created from the averaged scales (cognitive reappraisal and expression suppression) from the ERQ after reverse-scoring suppression items.

2.5. Outcome analysis strategy

The data for this study had a hierarchical structure in which three repeated measures (pre-intervention baseline, post-intervention, and follow-up) were nested within teachers at level-2 and teachers were nested within schools at level-3. Thus, similar to Jennings et al. (2017), three-level hierarchical linear growth models were employed (Raudenbush & Bryk, 2002; Singer & Willett, 2003) to examine the effects of CARE on changes in teachers' well-being and social-emotional competence over three points in time (pre, post, follow-up). Prior to fitting a linear growth model, assuming a constant rate of change from pre to post and from post to follow-up, preliminary data analyses were conducted to determine whether a linear trend could adequately describe the data. Empirical growth plots were examined to visualize how teacher outcomes changed over time. Then repeated-measures mixed models were estimated with time as a categorical within-subject factor to avoid the assumption of a linear form of change and allow for point-in-time comparisons. These preliminary analyses indicated that a linear functional form would be appropriate for describing changes in each outcome.

As shown in Eq. (1), the 1evel-1 or within-teacher model specified repeated measures of each outcome as a linear function of time.

[9] A complete description of the factor analytic procedures and results can be found in the Jennings et al. (2017) online supplementary materials

The time variable was centered at the first measurement occasion (coded 0 for pre, 1 for post, and 2 for follow-up) so that the intercept (π_{0ij}) represented the initial status of teacher i in school j and the slope (π_{1ij}) represented the rate of change for teacher i in school j during each time interval.

$$Y_{tij} = \pi_{0ij} + \pi_{1ij}(Time)_{tij} + e_{tij} \quad (1)$$

The level-2 models were formulated to describe between-teacher variation in changes. As displayed in Eqs. (2a) and (2b), the level-1 intercept and slope parameters were allowed to vary across teachers as a function of teacher-level predictors. Given the multi-site cluster randomized trial design with teachers as the unit of randomization, intervention status was included as a teacher-level characteristic. Consistent with Jennings et al. (2017), analyses controlled for cohort. The coefficient of *CARE* (β_{01j}) in Eq. (2a) represents the expected differences in initial status between the CARE and control groups. Because Jennings et al. (2017) showed that randomization was successful in balancing the intervention and control groups in terms of demographic characteristics and baseline outcome measures, no significant impacts of the intervention assignment on initial status were expected. The coefficient of CARE (β_{11j}) in Eq. (2b) captures a cross-level interaction between time and intervention status that assesses whether the rate of change in each outcome differs for teachers participating in CARE, compared with those in the control group. At level-3, no school-level predictors were included, but initial status (β_{00j}) and change rate (β_{10j}) were allowed to vary randomly across schools to account for the nested structure of the data. The other level-2 coefficients were fixed to be same across all schools.

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}(CARE)_{ij} + \beta_{02j}(Cohort)_{ij} + r_{0ij} \quad (2a)$$

$$\pi_{1ij} = \beta_{10j} + \beta_{11j}(CARE)_{ij} + \beta_{12j}(Cohort)_{ij} + r_{1ij} \quad (2b)$$

Additionally, Poisson hierarchical generalized linear models (Raudenbush & Bryk, 2002) was used to examine the impacts of CARE on count outcomes (i.e., teacher reports of daily physical symptoms including ache-related symptoms, medication usage, and gastrointestinal-related symptoms) across three assessment time points. The modeling framework presented above can be easily extended to Poisson models via a log link function. Having detected significant over-dispersion, a Poisson model with an over-dispersion parameter for gastrointestinal-related symptoms was specified, which is equivalent to estimating a negative binomial model (Long & Freese, 2006).

We also conducted a set of interaction analyses to examine whether teachers' baseline levels of psychological distress and emotion regulation moderate the intervention impacts on the rate of change of each outcome. As shown in the Eq. (2c), a potential moderator (M) and an interaction term between the moderator and the intervention status ($M \times CARE$) were added to the main effects models described in the Eq. (2b) above.

$$\pi_{1ij} = \beta_{10j} + \beta_{11j}(CARE)_{ij} + \beta_{12j}(Cohort)_{ij} + \beta_{13j}(M)_{ij} + \beta_{14j}(M \times CARE)_{ij} + r_{1ij} \quad (2c)$$

All analyses were performed in HLM version 7.01 (Raudenbush, Bryk, & Congdon, 2013) using Maximum Likelihood (ML) estimation. There were missing observations at level-1 mainly due to attrition over time. The ML estimation procedure allowed for the inclusion of all teachers in the analyses, even those with only one data point, resulting in unbiased estimates of parameters under the assumption that data are missing at random (Little & Rubin, 2002). Statistical significance of the estimated coefficients was considered achieved at an alpha level of $p < .05$. Effect sizes to assess practical significance of findings are reported. For each continuous outcome, effect sizes were calculated as suggested by Feingold (2009) by dividing the model-estimated coefficients by the pooled within-group standard deviation of the outcome measured at baseline. For count outcomes, Incident Rate Ratio (IRR) are reported, i.e., exponentiated coefficients, to help substantive interpretation. As an additional measure of the practical importance of the intervention effects, we used an improvement index representing the difference in percentile rank between the average teacher in the CARE group and the average teacher in the control group. Following the procedure outlined in the What Works Clearinghouse (Institute of Education Sciences, 2017), we first obtained a U3 index by finding the area under the normal distribution below a value of z-score (i.e., effect size) and then calculated an improvement index by U3–50%.

3. Results

3.1. Impacts of CARE on teacher outcomes

Table 2 presents means and standard deviations for teacher outcomes at pre, post, and 9.5-month follow-up by intervention status.

3.1.1. Teachers' well-being and social-emotional competence

Table 3 presents the results from the three-level linear growth models for each of five factors measuring teachers' well-being and social-emotional competence. The impacts of CARE were estimated for the intercept (i.e., initial status) and linear slope parameters (i.e., change rate). The estimated group differences in initial status and change rate are reported in the columns labeled 'Intervention' and 'Time × Intervention,' respectively.

As expected, these analyses found no significant baseline differences between the CARE and control groups for any outcome measure. As shown in Table 3, for the rate of change over time, significant time-by-intervention interactions were found for psychological distress. As shown in Fig. 2, levels of psychological distress declined significantly over time for teachers in both groups ($b = -0.12, p < 0.01$; see Time column in Table 3) but declined at a significantly faster rate for intervention versus control teachers ($b = -0.12$, $p < 0.01$, $ES = -0.16$; see Intervention × Time column in Table 3). The effect size of −0.16 translates into an

Table 3
CARE impacts on teacher emotional well-being.

	Fixed effect											Random effect: Variance component				
	Intercept		Intervention		Time		Intervention × Time					L-1 Residual, e_{tij}	L-2 Initial, r_{0ij}	L-2 Slope, r_{1ij}	L-3 Initial, u_{00j}	L-3 Slope, u_{t0j}
	b	SE	*b*	SE	*b*	SE	*b*	SE	ES	U3	Imp. Index					
Mindfulness	3.61***	(0.04)	0.01	(0.05)	0.02	(0.02)	0.05 †	(0.03)	0.12	0.55	4.78%	0.063	0.111***	0.006***	0.002	0.000
Describing	3.72***	(0.07)	0.00	(0.09)	0.02	(0.03)	0.02	(0.04)	0.03	0.51	1.20%	0.136	0.310***	0.018**	0.000	0.000
Non-judging	3.68***	(0.08)	−0.08	(0.09)	−0.07	(0.04)	0.15***	(0.04)	0.21	0.58	8.32%	0.173	0.328***	0.002	0.008	0.002
Awareness	3.74***	(0.07)	0.04	(0.09)	0.02	(0.03)	0.01	(0.04)	0.01	0.50	0.40%	0.148	0.306***	0.016*	0.015	0.002
Observing	3.35***	(0.07)	−0.06	(0.09)	0.02	(0.04)	0.14**	(0.05)	0.20	0.58	7.93%	0.183	0.278***	0.023**	0.000	0.000
Non-reactive	3.17***	(0.06)	−0.05	(0.07)	0.06	(0.04)	0.05	(0.05)	0.08	0.53	3.19%	0.196	0.133***	0.002	0.000	0.000
Interper. awareness	3.93***	(0.05)	0.09	(0.06)	0.03	(0.03)	0.01	(0.04)	0.02	0.51	0.80%	0.125	0.127***	0.013***	0.000	0.000
Psychological distress	2.64***	(0.08)	−0.08	(0.09)	−0.12**	(0.03)	−0.12**	(0.04)	−0.16	0.44	−6.36%	0.131	0.374***	0.003	0.046**	0.009**
Depression	1.78***	(0.07)	−0.13 †	(0.08)	−0.07*	(0.03)	−0.05	(0.04)	−0.08	0.47	−3.19%	0.134	0.244***	0.001	0.024*	0.006
Anxiety	2.08***	(0.10)	−0.10	(0.11)	−0.12*	(0.05)	−0.07	(0.05)	−0.08	0.47	−3.19%	0.254	0.444***	0.005	0.068**	0.026***
Panas - Negative	2.22***	(0.09)	0.07	(0.10)	−0.01	(0.04)	−0.17**	(0.05)	−0.21	0.42	−8.32%	0.275	0.293***	0.003	0.052**	0.005
Sleep	3.15***	(0.10)	0.20	(0.12)	0.03	(0.05)	0.11	(0.07)	0.11	0.54	4.38%	0.368	0.527***	0.052**	0.009	0.001
Emotional exhaustion	4.30***	(0.16)	−0.22	(0.18)	−0.09	(0.07)	−0.12	(0.08)	−0.09	0.46	−3.59%	0.615	1.199***	0.001	0.165**	0.025*
Perceived stress	2.53***	(0.09)	−0.02	(0.11)	0.00	(0.05)	−0.09	(0.06)	−0.11	0.46	−4.38%	0.260	0.402***	0.039**	0.008	0.006
Time urgency	3.34***	(0.05)	−0.13 †	(0.07)	−0.02	(0.02)	−0.01	(0.03)	−0.02	0.49	−0.80%	0.053	0.219***	0.007*	0.000	0.000
Efficacy	7.17***	(0.10)	0.11	(0.12)	0.04	(0.06)	0.03	(0.07)	0.03	0.51	1.00%	0.474	0.432***	0.019	0.002	0.012
Emotion regulation	4.85***	(0.07)	0.04	(0.09)	−0.05	(0.04)	0.18 ***	(0.05)	0.26	0.60	10.26%	0.247	0.240***	0.008	0.001	0.006

Note:
*** $p < .001$.
** $p < .01$.
* $p < .05$.
† $p < .10$.

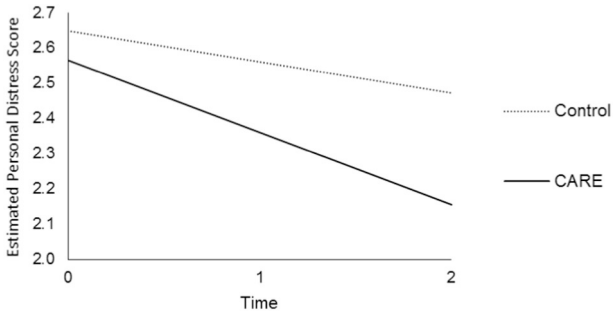

Fig. 2. Impact of CARE on psychological distress.

improvement index of −6.4%. The improvement index is the expected change in the percentile rank of the typical person in the control condition if he/she had been randomly allocated to the intervention condition (Institute of Educational Sciences, 2017). This result indicates that average teachers in the control group would have decreased approximately 6 percentile points on rates of change in psychological distress had they received the CARE intervention.

Additionally, post-hoc analyses were conducted to determine which subscales were responsible for the time-by-intervention effects observed on the psychological distress factor. The significant group difference in the rate of change was explained by one of its six subscales: PANAS-negative affect ($b = -0.17$, $p < 0.01$, $ES = -0.21$). The effect size of −0.21 corresponds to an improvement index of −8.32%, which indicates that if average teachers in the control group had received the CARE intervention they would have moved down approximately 8 percentile points on the rates of change in negative affect. As shown in Table 3, for mindfulness, two of seven subscales showed significant intervention effects: non-judging ($b = 0.15$, $p < 0.001$, $ES = 0.21$) and observing ($b = 0.14$, $p < 0.01$, $ES = 0.20$). The effect sizes were small, with improvement indices of 8.32% and 7.93% for non-judging and observing, respectively.

A significant impact on linear change in adaptive emotion regulation was found ($b = 0.18$, $p < 0.01$, $ES = 0.26$). The result indicated that CARE teachers' emotion regulation skills increased, on average, at a per time unit rate of 0.18 points higher than those of their control counterparts. As illustrated in Fig. 3, the CARE participants showed a significant increase in emotion regulation skills over the three measurement occasions while a slight decline was observed for the control teachers. The effect size of 0.26 translates to an improvement index of about 10.3%, which indicates that being assigned to the CARE condition would have led to improvements of 10.3 percentile points on the emotion regulation growth rates.

3.1.2. Teachers' daily physical symptoms and medication use

The results of three-level Poisson models for repeated count outcomes are presented in Table 4 and illustrated in Figs. 4, 5, and 6. HLM produces unit-specific and population-average results for hierarchical generalized linear models using nonlinear link functions. Given that the primary interest in the current study is on how CARE participation (a level-2 predictor) made a difference in the pattern of changes in a given outcome over time (level-1 processes), unit-specific estimates are reported rather than population-average estimates (Raudenbush & Bryk, 2002).

No significant baseline differences between the control and CARE-treated groups were found for any of three count outcomes. The number of ache-related symptoms, gastrointestinal-related symptoms and medication use tended to decrease over time for both control and intervention groups, as shown in Figs. 4, 5, and 6. However, the time-by-intervention interaction was statistically significant only for ache-related symptoms. The result indicates that for each time interval, reduction in ache-related symptoms was about 18% more for the CARE-treated group than the control group ($b = -0.20$, $p < 0.05$, $IRR = e^{-0.20} = 0.82$). Compared to the control group exhibiting a steady downward trend, the intervention group showed a significantly steeper reduction in ache-related symptoms over the three time points.

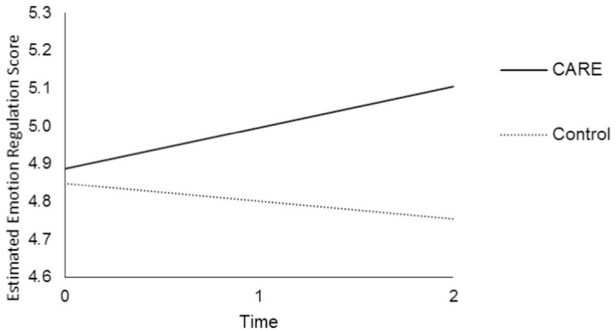

Fig. 3. Impact of CARE on adaptive emotion regulation.

Table 4
CARE Impacts on Teacher Physical Symptoms and Medication Use.

	Fixed Effect										Random Effect: Variance Component			
	Intercept			Intervention		Time		Intervention × Time			L-2 Initial, r_{0ij}	L-2 Slope, r_{1ij}	L-3 Initial, u_{00j}	L-3 Slope, u_{i0j}
	b		SE	*b*	SE	*b*	SE	*b*		SE				
Ache-Related Symptoms	0.08	***	(0.12)	0.09	(0.14)	-0.08	(0.09)	-0.20	*	(0.10)	0.289*	0.009	0.079*	0.035
Gastrointestinal Symptoms	-2.10	***	(0.26)	-0.28	(0.32)	-0.25	(0.19)	-0.33		(0.23)	3.284***	1.028***	0.178	0.145
Sum of Medication	0.14		(0.11)	-0.14	(0.14)	-0.09	(0.07)	-0.07		(0.10)	0.306	0.002	0.025	0.002

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

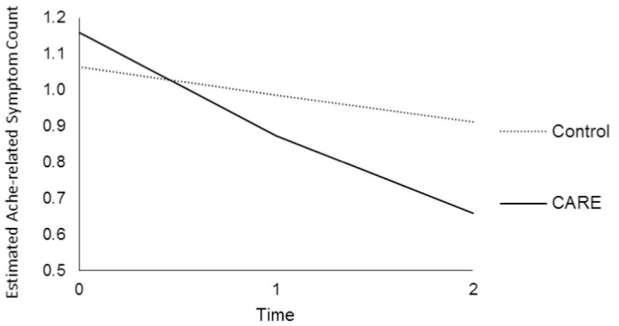

Fig. 4. Impact of CARE on ache-related symptoms.

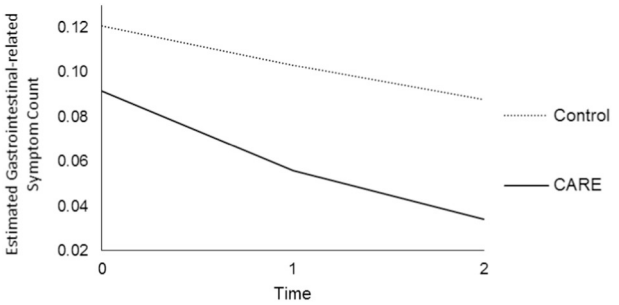

Fig. 5. Impact of CARE on gastrointestinal-related symptoms.

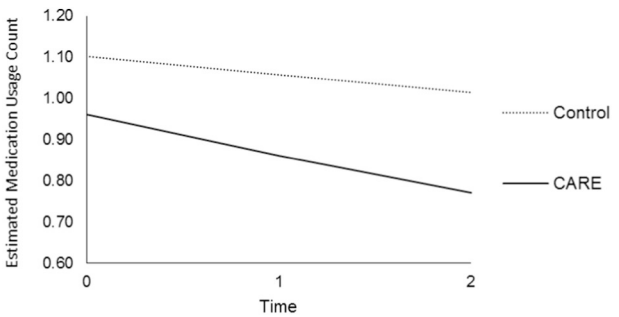

Fig. 6. Impact of CARE on medication usage.

3.2. Moderating effects of baseline psychological distress and emotion regulation

We found a significant moderating effect of teachers' baseline levels of psychological distress for emotion regulation growth rates ($b = 0.12$, $p < .05$, $ES = 0.17$). The effect of the CARE intervention was stronger for those with the higher levels of psychological distress at baseline. To ease interpretation of the moderating effect, we plotted the trajectory of emotion regulation for the CARE and

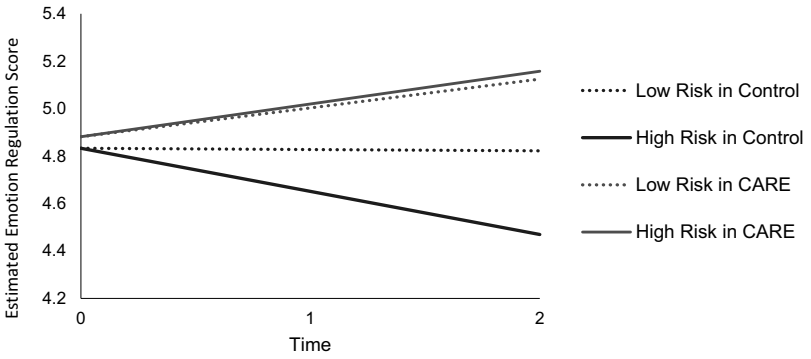

Fig. 7. Moderating role of baseline psychological distress in the CARE impact on emotion regulation.

control teachers at low (0.5 SD below the mean) versus high (0.5 SD above the mean) levels of baseline psychological distress. As illustrated in Fig. 7, the differences in the slope of emotion regulation between the CARE and control groups were much larger for high risk teachers than for low risk teachers. It was particularly notable that the control teachers starting with higher levels of psychological distress exhibited a marked decline in emotion regulation over time while their counterparts in the CARE condition displayed a modest improvement in emotion regulation from baseline to follow-up. As we found a significant moderating effect of baseline levels of psychological distress, we performed a separate analysis for a subgroup of teachers who had high levels of baseline psychological distress ($\geq$0.5 SD above the mean). The effect of the CARE intervention on emotion regulation growth rates was much greater for this subgroup (n = 70, b = 0.33, p < .01, ES = 0.47) than for the full sample (b = 0.18, p < 0.01, ES = 0.26). In contrast, the CARE group did not show significant differences in the growth of emotion regulation for the low-risk teachers (n = 77, b = 0.10, p = .220) and medium-risk teachers (n = 75, b = 0.12, p = .197).

4. Discussion

This study reports longitudinal findings of the effects of the CARE program on teacher self-reported experiences of stress, well-being, social-emotional competencies, and physical health between the fall of one school year and the fall of the following year. Teachers were randomly assigned within-schools to receive training in CARE or to a wait-list control group during one school year (September–June). Teachers in the intervention group received five days of training in the CARE program, which included didactic and experiential learning of mindfulness concepts and practices (totaling 30 contact hours) between November and February, and three rounds of inter-session calls by facilitators to encourage and support teachers' use of the practices and the application of skills to their teaching. Teachers were assessed in the fall of one school year prior to random assignment and intervention onset (pre-test), in the spring of the same year after the completion of intervention implementation (post-test), and in the fall of the following school year (follow-up).

While there have been a small number of randomized trials of mindfulness-based interventions for teachers that have shown promising results in follow-up assessments, these studies have been limited by the inclusion of primarily Caucasian samples, follow-up assessments at only 2 to 3 months post-intervention, and estimates of intervention impacts at follow-up (controlling for prior assessments) rather than intervention-induced group differences in changes in outcomes over time. The present study contributes to a growing body of work on MBIs for teachers by including a large, urban, racially/ethnically diverse sample, and by estimating intervention impacts on teachers' experiences from pre-test to post-test to follow-up, with follow-up assessment occurring approximately nine-and-a-half months post-intervention. This study extends the understanding of previously reported findings of the impacts of CARE for intervention teachers between the beginning and end of one school year when compared to controls (Jennings et al., 2017).

Jennings et al. (2017) found significant post-test differences in mindfulness at the end of the school year. In the current study examination of linear change over time found only trend level time X intervention effects for mindfulness. However, post hoc analyses indicated continuing significant intervention effects on the same two subscales, nonjudgment and observing, that explained post-test only impacts in the prior study. While intervention and control teachers reported no differences in mindfulness at baseline, teachers exposed to CARE not only reported higher average levels of mindfulness (non-judging and observing) at post-test, controlling for pretest scores (Jennings et al., 2017), but also greater gains in the non-judging and observing components of mindfulness over one full school year relative to control teachers.

In line with Jennings et al.'s (2017) findings, significant linear effects were also found for the psychological distress aggregate factor, with both results having similar magnitudes of intervention effect sizes (0.18 and 0.16, respectively). In contrast to Jennings et al., however, post hoc analyses indicated a different driver of the effects. At the post-test, Jennings et al. found that significant effects on psychological distress were accounted for by improved sleep and reduced emotional exhaustion among CARE teachers relative to control teachers; in this study no significant intervention differences were observed in linear change over time for sleep or emotional exhaustion, but greater reductions were found in negative affect. Indeed, Jennings et al. found the intervention effect in

negative affect at post-test to be in the expected direction with a small, but non trivial effect size ($\beta = -0.13, p < 0.13, ES = 0.16$). Certain aspects of teachers' psychological distress, such as sleep quality and emotional exhaustion, may require more intense and/or ongoing forms of intervention support to produce sustained improvements, while other aspects of psychological distress, such as negative affect, may be less sensitive to short-term change, with a period of latent sensitivity to the intervention preceding a detectable effect.

Consistent with findings from Jennings et al. (2017), significant linear increases over time in adaptive emotion regulation were observed for the CARE group compared to control teachers. While control teachers showed a slight decline in their adaptive emotion regulation from the beginning of school year one to the beginning of the second school year, CARE teachers increased in emotion regulation continued during this same period.

In addition, results of the moderation analyses indicated that beneficial impacts of the CARE intervention depended on baseline levels of psychological distress. Specifically, the effect of the CARE intervention on emotion regulation was much greater for teachers with higher reported psychological distress at baseline. This finding suggests that teachers with initially elevated levels of psychological distress benefit more, in terms of emotion regulation, from the CARE intervention than those with lower baseline levels of psychological distress.

One surprising result found in this study was a significant linear decrease in ache-related symptoms for CARE teachers compared to control teachers. While both groups decreased in symptoms reported at post-test and follow-up, teachers who received the CARE intervention had significantly greater reductions in symptoms over time. This reduction in physical distress is congruent with prior findings on the CARE program that also showed reductions in physical health symptoms (Jennings et al., 2013).

Previously, Jennings et al. (2017) found that CARE teachers reported significantly lower levels of time urgency than control teachers at post-test, accounted for by significant intervention differences in the speech-related hurry and time-related hurry; however, in the present study no significant intervention effect was found for time urgency. Although CARE teachers still reported lower levels of time urgency compared to control teachers, their scores at follow-up rebounded toward pre-test levels which reduced intervention differences to a non-significant level.

Although previous studies on the CARE program have shown differences in teaching efficacy (Jennings et al., 2013), neither the Jennings et al. (2017) analysis of post-test data, nor this study found significant differences in teaching efficacy between the treatment and control groups. Jennings et al. previously noted the high mean-level scores for the subscales when compared to previous studies. Follow-up scores for both treatment and control groups were even higher than baseline, possibly resulting in a ceiling effect and difficulty detecting differences.

Taken together, the current findings show continued impacts of CARE when examined in a longitudinal context over one full year. Two of the four main factors previously found to be significant between the fall and spring of one school year remained significant the following fall including dimensions of mindfulness, psychological distress, and adaptive emotion regulation. Further, while CARE teachers showed fewer physical symptoms at post-test relative to control teachers (Jennings et al., 2017), testing change over time through the follow-up period revealed significant reductions in teachers' ache-related symptoms. These findings are also largely consistent with findings to date from other rigorously designed tests of MBIs designed for teachers. For example, Roeser et al. (2013) found that teachers' randomly assigned to training in another MBI reported continued improvement in mindfulness and occupational self-compassion and reductions in occupational stress, burnout, anxiety, and depression symptoms assessed at a 3-month follow-up post-intervention. Another report involving the same sample found continued reductions in negative mood at the 3-month follow up but also improvement in sleep quality which was not found immediately post-intervention (Crain et al., 2017).

4.1. Limitations

The present study had several limitations. As noted by Jennings et al. (2017), schools and teachers in the study sample participated in the study and the CARE program voluntarily, so the findings reported here may not be generalizable to a sample of teachers mandated to participate in the program. Further, while these findings extend our understanding of the longer term significance of the CARE program for teachers, the magnitudes of these effects are generally small. However, given that CARE is a universal prevention program (rather than targeted), small effect sizes are expected (Greenberg & Abenavoli, 2017). Indeed, the sample of teachers scored below diagnostic ranges in both anxiety and depression suggesting the sample was normative (rather than at risk). Teachers who scored higher on psychological distress showed greater improvement on emotion regulation (ES = 0.47).

An important limitation of the present study is that the findings are based exclusively on teacher-reported outcomes. Unlike the Jennings et al. (2017), observational data of classrooms was not available at the third data collection time point. Finally, we were limited to the assessment of linear change over time rather than more complex patterns of change that would require more than three assessment waves.

4.2. Implications for practice, policy and future research

The present study represents an important step in reporting the results of a large cluster randomized controlled trial, providing evidence of continued impact of the intervention over one year. Findings from the present study and from Jennings et al. (2017) suggest that an intensive intervention (5 days of training during fall/winter) with coaching delivered in one school year can produce both short-term effects on teachers' stress and well-being at the end of one school year as well as sustained effects on these outcomes through the fall of the following year. The results also show that CARE is particularly helpful for teachers reporting higher levels of psychological distress. Next steps include examining teachers' reports of independent use of CARE practices to determine the impact

of levels of practice engagement on outcomes and examining potential differential effects by teacher subgroups based on demographic characteristics (e.g., age and years of experience). This will provide greater confidence that the overall impacts reported in this and other related studies are robust for teachers with varying levels of experience. Finally, additional research is needed to determine whether the CARE program is scalable for whole school or district wide implementation. While some coaching was provided to teachers in the present study, more extensive learning support might help teachers maintain and continue to show improvements (Opfer & Pedder, 2011). Additional booster sessions and integration into naturally occurring professional learning communities should be considered in future research to assess scalability and sustainability.

Recent evidence of modest per teacher costs for the implementation of the CARE program (Doyle, Brown, Rasheed, Jones, & Jennings, 2018), and other findings from randomized trials showing consistent sustained benefits to teachers (Crain et al., 2017; Roeser et al., 2013), suggest that pre-service and in-service opportunities for teachers to be exposed to and supported in the development and practice of mindful awareness could have substantial long-term benefits. There remain, however, a number of important questions for future research.

Additional studies examining longer-term follow-up effects of teacher mindfulness-based interventions are needed. Such studies should include not only teacher self-reported outcomes, but also outcomes derived from physiological measures of teacher stress and well-being, such as diurnal and longer-term variability in cortisol responses, heart rate variability, and actigraphy monitoring for better assessments of sleep quality. Impacts on outcomes more closely tied to potential cost benefits such as teachers' healthcare costs, across year mobility between schools and positions, and attrition from the profession may be of greater relevance to education policymakers. Further, while there is preliminary evidence that teacher-focused mindfulness interventions can have direct effects on teachers' reports of academic engagement among their students (Brown et al., 2017), additional research is needed to examine short- and long-term benefits of teacher mindfulness programs on students' academic and social-emotional outcomes through direct assessments and school records.

Declaration of Competing Interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jsp.2019.07.009.

References

Amutio, A., Martinez-Taboada, C., Hermosilla, D., & Delgado, L. C. (2015). Enhancing relaxation states and positive emotions in physicians through a mindfulness training program: A one-year study. *Psychology, Health & Medicine, 20*(6), 720–731. https://doi.org/10.1080/13548506.2014.986143.

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., & Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329–342. https://doi.org/10.1177/1073191107313003.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241. https://doi.org/10.1093/clipsy.bph077.

Blitstein, J. L., Hannan, P. J., Murray, D. M., & Shadish, W. R. (2005). Increasing the degrees of freedom in existing group randomized trials: The df* approach. *Evaluation Review, 29*(3), 241–267. https://doi.org/10.1177/0193841X04273257.

Brown, J. L., Jennings, P. A., Rasheed, D. S., Cham, H., Doyle, S. L., Frank, J. L., ... Greenberg, M. T. (2017). April*Direct and moderating impacts of the CARE for teachers intervention on student outcomes. Paper presented at the American education research association.* TX: San Antonio.

Buysse, D., Stover, A., Buysse, D. J., Yu, L., Moul, D. E., ... Germain, A. Dodds (2010). Development and validation of patient-reported outcome measures for sleep disturbance and sleep-related impairments. *Sleep, 33*(6), 29–33. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2880437/.

CASEL (2019). Core SEL competencies. retrieved from https://casel.org/core-competencies/.

Castillo-Gualda, R., Herrero, M., Rodríguez-Carvajal, R., Brackett, M. A., & Fernández-Berrocal, P. (2018). The role of emotional regulation ability, personality, and burnout among Spanish teachers. *International Journal of Stress Management. Advance online publication.*. https://doi.org/10.1037/str0000098.

Chien, W. T., & Thompson, D. R. (2014). Effects of a mindfulness-based psychoeducation programme for Chinese patients with schizophrenia: 2-year follow-up. *British Journal of Psychiatry, 205*(1), 52–59. https://doi.org/10.1192/bjp.bp.113.134635.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385–396. https://doi.org/10.2307/2136404.

Cornfield, J. (1978). Randomization by group: A formal analysis. *American Journal of Epidemiology, 108*(2), 100–102.

Crain, T. L., Schonert-Reichl, K. A., & Roeser, R. W. (2017). Cultivating teacher mindfulness: Effects of a randomized controlled trial on work, home, and sleep outcomes. *Journal of Occupational Health Psychology, 22*(2), 138–152. https://doi.org/10.1037/ocp0000043.

de Vibe, M., Bjørndal, A., Fattah, S., Dyrdal, G. M., Halland, E., & Tanner-Smith, E. E. (2017). Mindfulness-based stress reduction (MBSR) for improving health, quality of life, and social functioning in adults. *Campbell Systematic Reviews,* (11), 13.

de Vibe, M., Solhaug, I., Tyssen, R., Friborg, O., Rosenvinge, J. H., Sorlie, T., & Bjorndal, A. (2013). Mindfulness training for stress management: A randomised controlled study of medical and psychology students. *BMC Medical Education, 13*, 107. https://doi.org/10.1186/1472-6920-13-107.

DeWeese, A. R., Jennings, P. A., Brown, J. L., Doyle, S. L., Davis, R. T., Rasheed, D. S., ... Greenberg, M. T. (2017). Coding semi-structured interviews: Examining coaching calls within the CARE for Teachers program. *SAGE Research Methods Cases Part, 2*. https://doi.org/10.4135/9781473958319.

Domitrovich, C. E., Bradshaw, C. P., Berg, J. P., Pas, E. T., Becker, K. D., Musci, R., & Ialongo, N. (2016). How do school-based prevention programs impact teachers? Findings from a randomized trial of an integrated classroom management and social-emotional program. *Prevention Science, 17*, 325–337. https://doi.org/10.1007/s11121-015-0618-z.

Doyle, S., Jennings, P. A., Brown, J. L., DeWeese, A., Rasheed, D., Frank, J. L., ... Greenberg, M. T. (2018). Exploring the relationship between implementation quality and uptake of the cultivating awareness and resilience in education (CARE) for teachers program. *Mindfulness*. https://doi.org/10.1007/s12671-018-1034-9.

Doyle, S. L., Brown, J. L., Rasheed, D., Jones, D. E., & Jennings, P. A. (2018). Cost analysis of ingredients for successful implementation of a mindfulness-based professional development program for teachers. *Mindfulness*. https://doi.org/10.1007/s12671-018-0958-4.

Doyle, S. L., Jennings, P. A., DeWeese, A., & Frank, J. (2014). Evaluating the fidelity of the Cultivating Awareness and Resiliance in Education (CARE) professional development program. *22nd annual Society for Prevention Research Conference* Washington, D.C.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*, 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x.
Emerson, L.-M., Leyland, A., Hudson, K., Rowse, G., Hanley, P., & Hugh-Jones, S. (2017). Teaching mindfulness to teachers: A systematic review and narrative synthesis. *Mindfulness, 8*, 1136–1149. https://doi.org/10.1007/s12671-017-0691-4.
Feingold, A. (2009). Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods, 14*(1), 43–53. https://doi.org/10.1037/a0014699.
Fjorback, L. O., Arendt, M., Ornbol, E., Walach, H., Rehfeld, E., Schroder, A., & Fink, P. (2013). Mindfulness therapy for somatization disorder and functional somatic syndromes - randomized trial with one-year follow-up. *Journal of Psychosomatic Research, 74*(1), 31–40. https://doi.org/10.1016/j.jpsychores.2012.09.006.
Flook, L., Goldberg, S. B., Pinger, L., Bonus, K., & Davidson, R. J. (2013). Mindfulness for teachers: A pilot study to assess effects on stress, burnout, and teaching efficacy. *Mind, Brain, and Education, 7*(3), https://doi.org/10.1111/mbe.12026.
Frank, J. L., Jennings, P. A., & Greenberg, M. T. (2016). Validation of the mindfulness in teaching scale. *Mindfulness, 7*(1), https://doi.org/10.1007/s12671-015-0461-0.
Glander, M. (2015). *Selected statistics from the public elementary and secondary education universe: School year 2013–14 (NCES 2015–151)*. U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved November 1, 2018 from http://nces.ed.gov/pubsearch.
Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Baer, R. A., et al. (2016). Contemplating mindfulness at work: An integrative review. *Journal of Management, 42*, 114–142. https://doi.org/10.1177/0149206315617003.
Goyal, M., Singh, S., Sibinga, E. M. S., Gould, N. F., Rowland-Seymour, A., Sharma, R., ... Haythornthwaite, J. A. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine, 174*(3), 357–368. https://doi.org/10.1001/jamainternmed.2013.13018.
Greenberg, M. T., & Abenavoli, R. (2017). Universal interventions: Fully exploring their impacts and potential to produce population-level impacts. *Journal of Research on Educational Effectiveness, 10*(1), 40–67. https://doi.org/10.1080/19345747.2016.1246632.
Greenberg, M. T., Brown, J. L., & Abenavoli, R. M. (2016). *Teacher stress and health: Effects on teachers, students, and schools.* Edna Bennett Pierce Prevention Research Center, The Pennsylvania State University1–12. Retrieved from http://www.rwjf.org/en/library/research/2016/07/teacher-stress-and-health.html.
Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348.
Halland, E., de Vibe, M., Solhaug, I., Tyssen, R., Friborg, O., Rosenvinge, J. H., ... Bjørndal, A. (2015). Mindfulness training improves problem-focused coping in psychology and medical students. *College Student Journal, 49*(3), 387–398.
Haynes, M., Maddock, A., & Goldrick, L. (2014). On the path to equity: Improving the effectiveness of beginning teachers. *Alliance for excellent Edcation. July*. Retrieved from http://all4ed.org/reports-factsheets/path-to-equity/.
Henderson, V., Clemow, L., Massion, A., Hurley, T., Druker, S., & Hebert, J. R. (2012). The effects of mindfulness-based stress reduction on psychosocial outcomes and quality of life in early-stage breast cancer patients: A randomized trial. *Breast Cancer Research and Treatment, 131*(1), 99–109. https://doi.org/10.1007/s10549-011-1738-1.
Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*(2), 169–183. https://doi.org/10.1037/a0018555.
Hoglund, W. L. G., Klingle, K. E., & Hosan, N. E. (2015). Classroom risks and resources: Teacher burnout, classroom quality and children's adjustment in high needs elementary schools. *Journal of School Psychology, 53*(5), 337–357. https://doi.org/10.1016/j.jsp.2015.06.002.
Hoyle, R. H. (Ed.). (2012). *Handbook of structural equation modeling.* New York, NY: Guilford Press.
Institute of Education Sciences (2017). *What Works Clearinghouse procedures and standards handbook (version 4.0)*. Washington, DC: Author. Retrieved from https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_standards_handbook_v4.pdf.
Jennings, P. A. (2015). Early childhood teachers' well-being, mindfulness, and self-compassion in relation to classroom quality and attitudes towards challenging students. *Mindfulness, 6*(4), 732–743. https://doi.org/10.1007/s12671-014-0312-4.
Jennings, P. A. (2016). CARE for Teachers: A mindfulness-based approach to promoting teachers' well-being and improving performance. In K. Schonert-Reichl, & R. Roeser (Eds.). *The handbook of mindfulness in education: Emerging theory, research, and programs* (pp. 133–148). New York, NY: Springer-Verlag.
Jennings, P. A., Brown, J. L., Frank, J. L., Doyle, S., Oh, Y., ... Davis, R. Greenberg (2017). Impacts of the CARE for teachers program on teachers' social and emotional competence and classroom interactions. *Journal of Educational Psychology,* 1–19. https://doi.org/10.1037/edu0000187.
Jennings, P. A., & Frank, J. L. (2015). In-service preparation for educators. In J. Durlak, R. Weissberg, & T. Gullota (Eds.). *Handbook of social and emotional learning* (pp. 422–437). New York: Guilford.
Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2013). Improving classroom learning environments by cultivating awareness and resilience in education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly, 28*(4), 374–390. https://doi.org/10.1037/spq0000035.
Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research, 79*(1), 491–525. https://doi.org/10.3102/0034654308325693.
Jennings, P. A., Minnici, A., & Yoder, N. (2019). Creating the working conditions to enhance teacher social and emotional well-being. In D. Osher, M. Mayer, R. Jagers, K. Kendziora, & L. Wood (Eds.). *Keeping students safe and helping them thrive: A collaborative handbook for education, safety, and justice professionals, families, and communities, Vol. 1, chapter 9* (pp. 210–239). Westport, CT: Praeger.
Jennings, P. A., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2011). Improving classroom learning environments by cultivating awareness and resilience in education (CARE): Results of two pilot studies. *The Journal of Classroom Interaction, 46*(1), 37–48 Retrieved from http://www.jstor.org/stable/23870550.
Johnson, S. M., Kraft, M. A., & Papay, J. P. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record, 114*, 0161–4681.
Jones, S. M., Brown, J. L., & Aber, J. L. (2008). Classroom settings as targets of intervention and research. In M. Shinn, & H. Yoshikawa (Eds.). *Towards positive youth development: Transforming schools and community programs* (pp. 58–77). New York, NY: Oxford University Press.
Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114*(1–3), 163–173. https://doi.org/10.1016/j.jad.2008.06.026.
Kyriacou, C. (2011). Teacher stress: From prevalence to resilience. In J. Langan-Fox, & C. L. Cooper (Eds.). *Handbook of stress in the occupations* (pp. 161–173). Cheltenham, UK: Edward Elgar.
Landy, F. J., Rastegary, H., Thayer, J., & Colvin, C. (1991). Time urgency: The construct and its measurement. *Journal of Applied Psychology, 76*(5), 644–657. https://doi.org/10.1037/0021-9010.76.5.644.
Larsen, R. J., & Kasimatis, M. (1991). Day-to-day physical symptoms: Individual differences in the occurrence, duration, and emotional concomitants of minor daily illnesses. *Journal of Personality, 59*(3), 387–423. https://doi.org/10.1111/j.1467-6494.1991.tb00254.x.
Lawrence, M. W. (2016). Preserving our greatest resources: A quantitative study to better understand the role that worksite wellness programs may have in mediating the symptoms of teacher burnout. Dissertation received from http://search.proquest.com/docview/1847984144.
Li Grining, C., Raver, C. C., Champion, K., Sardin, L., Metzger, M., & Jones, S. M. (2010). Understanding and improving classroom emotional climate and behavior management in the “real world”: The role of head start teachers' psychosocial stressors. *Early Education & Development, 21*(1), 65–94. https://doi.org/10.1080/10409280902783509.
Little, R. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198–1202. https://doi.org/10.2307/2290157.
Little, R. J. A., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). New York, NY: John Wiley & Sons.
Long, S. J., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata* (2nd ed.). College Station, TX: Stata Press.
Lorenzo-Seva, U., & ten Berge, J. M. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology, 2*, 57–64. https://doi.org/10.1027/1614-2241.2.2.57.
Malarkey, W. B., Jarjoura, D., & Klatt, M. (2013). Workplace based mindfulness practice and inflammation: A randomized trial. *Brain, Behavior, and Immunity, 27*(1),

145–154. https://doi.org/10.1016/j.bbi.2012.10.009.
Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach burnout inventory manual* (3rd ed.). Palo Alto.
McLean, L., & Connor, C. M. (2015). Depressive symptoms in third-grade teachers: Relations to classroom quality and student achievement. *Child Development, 86*(3), 945–954. https://doi.org/10.1111/cdev.12344.
Meadows, G. N., Shawyer, F., Enticott, J. C., Graham, A. L., Judd, F., Martin, P. R., & Segal, Z. (2014). Mindfulness-based cognitive therapy for recurrent depression: A translational research study with 2-year follow-up. *Australian and New Zealand Journal of Psychiatry, 48*(8), 743–755. https://doi.org/10.1177/0004867414525841.
Merrill, R. M., & Sloan, A. (2014). Effectiveness of a health promotion program among employees in a western United States school district. *Journal of Occupational and Environmental Medicine, 56*, 639–644. https://doi.org/10.1097/JOM.0000000000000153.
Milkie, M. A., & Warner, C. H. (2011). Classroom learning environments and the mental health of first grade children. *Journal of Health and Social Behavior, 52*(1), 4–22. https://doi.org/10.1177/0022146510394952.
Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change.* New York, NY: Guilford Press.
Montgomery, C., & Rupp, A. A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education, 28*, 461–488. https://doi.org/10.2307/4126479.
Oberle, E., & Schonert-Reichl, K. A. (2016). Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students. *Social Science & Medicine, 159*(c), 30–37. https://doi.org/10.1016/j.socscimed.2016.04.031.
Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376–407. https://doi.org/10.3102/0034654311413609.
Pascoe, M. C., Thompson, D. R., & Ski, C. F. (2017). Yoga, mindfulness-based stress reduction and stress-related physiological measures: A meta-analysis. *Psychoneuroendocrinology, 86*, 152–168. https://doi.org/10.1016/j.psyneuen.2017.08.008.
Pianta, R. C., La Paro, K., & Hamre, B. K. (2008). *Classroom assessment scoring system (CLASS) manual: K-3.* Baltimore, MD: Paul H. Brookes Publishing Company.
Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks: Sage Publications, Inc.
Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2013). *HLM for windows.* Skokie, IL.
Raudenbush, S. W., Martinez, A., & Spybrook, J. (2007). Strategies for improving precision in group-randomized experiments. *Educational Evaluation and Policy Analysis, 29*(1), 5–29. https://doi.org/10.3102/0162373707299460.
Rhoads, C. H. (2011). The implications of "contamination" for experimental design in education. *Journal of Educational and Behavioral Statistics, 36*(1), 76–104. https://doi.org/10.3102/1076998610379133.
Roeser, R. W., Schonert-Reichl, K. A., Jha, A., Cullen, M., Wallace, L., Wilensky, R., & Harrison, J. (2013). Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. *Journal of Educational Psychology, 105*(3), https://doi.org/10.1037/a0032093.
Schochet, P. Z. (2008). *Technical methods report: Guidelines for multiple testing in impact evaluations.* Washington, D.C: National Center for Education Evaluation and Regional Assistance. Retrieved from https://files.eric.ed.gov/fulltext/ED501605.pdf.
Shernoff, E. S., Mehta, T. G., Atkins, M. S., Torf, R., & Spencer, J. (2011). A qualitative study of the sources and impact of stress among urban teachers. *School Mental Health, 3*(2), 59–69. https://doi.org/10.1007/s12310-011-9051-z.
Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurence.* New York, NY: Oxford University Press.
Solhaug, I., Vibe, M., Friborg, O., Sørlie, T., Tyssen, R., Bjørndal, A., & Rosenvinge, J. H. (2019). Long-term mental health effects of mindfulness training: A 4-year follow-up study. *Mindfulness*. https://doi.org/10.1007/s12671-019-01100-2 Advance online publication.
Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine, 166*(10), 1092. https://doi.org/10.1001/archinte.166.10.1092.
Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227–242. https://doi.org/10.1177/0022022106297301.
Treiblmaier, H., Bentler, P. M., & Mair, P. (2011). Formative constructs implemented via common factors. *Structural Equation Modeling: A Multidisciplinary Journal, 18*(1), 1–17.
Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783–805. https://doi.org/10.1016/S0742-051X(01)00036-1.
Tyson, O., Roberts, C. M., & Kane, R. (2009). Can implementation of a resilience program for primary school children enhance the mental health of teachers? *Australian Journal of Guidance & Counselling, 19*, 116–130. https://doi.org/10.1375/ajgc.19.2.116.
von der Embse, N. P., Pendergast, L. L., Segool, N., Saeki, E., & Ryan, S. (2016). The influence of test-based accountability policies on school climate and teacher stress across four states. *Teaching and Teacher Education, 59*, 492–502. https://doi.org/10.1016/j.tate.2016.07.013.
Werthamer-Larsson, L. (1994). Methodological issues in school-based services research. *Journal of Clinical Child & Adolescent Psychology, 23*(2), 121.
Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: Diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and dharma. *Contemporary Buddhism, 12*(1), 1–18. https://doi.org/10.1080/14639947.2011.564811.
Zhai, F., Raver, C. C., & Li-Grining, C. (2011). Classroom-based interventions and teachers' perceived job stressors and confidence: Evidence from a randomized trial in head start settings. *Early Childhood Research Quarterly, 26*, 442–452. https://doi.org/10.1016/j.ecresq.2011.03.003.