



# Effectiveness of Mindfulness-Based Social-Emotional Learning Program CARE for Teachers Within Croatian Context

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## Abstract

**Objectives** The initial results of mindfulness-based interventions (MBIs) designed for teachers have shown promise for promoting teachers' social and emotional competencies, their health, and well-being. The present study examined the effectiveness of CARE for Teachers program outside the USA in the country of Croatia, Europe, through self-report assessment and collection of physiological data.

**Methods** The sample included 54 teachers and other school personnel from public schools of which 25 were involved in the CARE for Teachers training. Participants completed a battery of self-report measures to assess mindfulness, burnout, self-compassion, and compassion. Non-ambulatory blood pressure and heart rate monitoring was also conducted.

**Results** At the post-test, intervention had significant positive effects on self-compassion ( $d = .35, p = .043$ ), and two of its subscales, common humanity ( $d = .49, p = .043$ ) and mindfulness ( $d = .66, p = .043$ ). There were no significant effects at post-test on other self-report measures. At the follow-up, participants reported significantly higher levels of observing, self-compassion (self-kindness, common humanity, and mindfulness), and compassion, and significantly lower levels of over-identification and disengagement than those in the control group, with medium-to-large effect sizes ranging from 0.50 to 0.73. There were no effects of the intervention at follow-up on burnout measures. Regarding cardiovascular measures, at post-test, CARE participants showed significantly lower average heart rates ( $d = -.60, p = .020$ ) than those in the control group. However, we found no significant intervention impacts on the blood pressure measures at post. The intervention impact showed no effect on the cardiovascular measures at follow-up.

**Conclusions** The introduction of the mindfulness-based intervention to a group of educators in Croatia had positive impacts on several indicators of their well-being and cardiovascular health.

**Keywords** Mindfulness-based intervention · Social-emotional learning · Self-compassion · Teachers · Cardiovascular health

There is substantial evidence that teachers' stress is a serious problem that can negatively impact not only teachers' and students' well-being but also the quality of instruction (Jennings et al. 2017; Katz et al. 2018). Various international studies have shown that up to one-third of teachers feel

stressed or extremely stressed with their job (Collie et al. 2012; Gardner 2010; Kyriacou 2011). A series of studies in the USA and other countries (Beshai et al. 2016; Franco et al. 2010; Roeser et al. 2013) have shown that teacher's stress can be reduced and their well-being can be enhanced by introducing mindfulness-based interventions (MBIs) that support teacher's coping abilities and emotion regulation skills.

Croatia is a European Union member state of 4.1 million residents. It became independent from the former Yugoslavia in 1991. Since independence, Croatia is struggling with a transition from socialism to a liberal capitalism and establishing a fair government and quality educational, health, and social system. At the end of 2019, the unemployment rate in Croatia was 6.4%, which was below than the EU average (Eurostat 2019). However, during the year 2018, 24.8% of Croatians lived at risk of either poverty or social exclusion

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or both while 8.6% experienced “severe material deprivation” (The World Bank 2019). The education in Croatia begins with preschools-kindergartens and is mandatory for children aged 6 to 15. The Teaching and Learning International Survey (TALIS Technical Report 2018) conducted within 30 countries of the Organisation for Economic Co-operation and Development (OECD) and 18 partner countries showed that Croatian teachers do not differ from the average in other countries when it comes to age and working conditions but are more educated than the EU average. The survey showed that over 90% of Croatian teachers are satisfied with their job, which is above the TALIS and EU average, but only 9% think that the teaching profession is appreciated by society, compared with the TALIS average of 32% and the EU average of 18%. During their career, teachers in Croatia are involved in different professional development programs that are rarely focused on the promotion of teachers’ well-being. Tomašević et al. (2016) examined stress intensity of 217 Croatian primary school teachers. The results indicated that over 50% of teacher expressed medium- or high-intensity stress. Foro (2015) conducted a multi-method study with 105 elementary school teachers in Croatia and found that lower social and emotional competence was a cause of teacher stress. Macuka et al. (2017) conducted a study on a sample of 1149 elementary school subject teachers in Croatia examining teacher emotional experiences as predictors of their mental health. Results indicated that certain emotions and emotional exhaustion significantly predicted symptoms of anxiety, depression, and somatization. The emotions detected were exhaustion, love, anger, and hopelessness experienced in relation to students; anxiety experienced in relation to parents; and disappointment with educational system. The obtained results emphasized the importance of investing into teacher’s emotional skills and well-being.

Teachers’ well-being can be defined as “a positive emotional state that is the result of a harmony between the specific context factors on the one hand and the personal needs and expectations towards the school on the other hand” (Petegem et al. 2005, p. 34). Teachers frequently experience a wide variety of intense emotions at their workplace including pleasant ones such as joy and happiness, pride, love and caring, compassion, enthusiasm, and excitement. However, teachers also experience unpleasant emotions such as anger and frustration, anxiety, hopelessness, sadness, and disappointment. Jennings and Greenberg (2009) noted that frequent unpleasant emotions may reduce teachers’ intrinsic motivation and feelings of self-efficacy, and consequently lead to their burnout. Burnout is a syndrome consisting of emotional exhaustion, depersonalization, and a lack of feeling of accomplishment in one’s work (Maslach et al. 2001). Chronic stress and burnout are associated with undesirable outcomes for teachers since they can cause physical and mental health problems such as anxiety and depression symptoms,

high blood pressure, or even cardiovascular disease (Dimsdale 2008; Gunnar and Quevedo 2007; Maslach et al. 2001; McEwen 2008). Fisher (2011) pointed out that teachers’ stress and burnout are significant predictors of their job dissatisfaction while Roeser et al. (2012) emphasized that these two can lead to work absenteeism and a diminished capacity to engage and effectively teach students. Briner and Dewberry (2007) confirmed that employees’ satisfaction with work, attitude towards their job, and their stress levels all impact their work performance. The teacher’s experience of stress and burnout may also directly impact students via “stress-contagion” (Oberle and Schonert-Reichl 2016).

Evidence suggests that teachers who lack social and emotional competence are more prone to emotional exhaustion. Teachers’ emotional exhaustion then impacts the classroom climate because their classroom management efforts are less effective, and they may experience a “burnout cascade” (Jennings and Greenberg 2009; Oberle and Schonert-Reichl 2016). In contrast, teachers who experience lower perceived stress and greater teaching efficacy and job satisfaction encourage greater achievement and self-efficacy in their students (Collie et al. 2012). Teachers who successfully manage their stress and effectively regulate their emotions can more frequently experience positive emotions that lead to enhanced resilience and enjoyment of teaching (Jennings et al. 2017), while enabling them to better cope with complex demands of teaching (Jennings and Greenberg 2009). Jennings and Greenberg (2009) proposed a model of the prosocial classroom that highlights the importance of teachers’ social and emotional competences and well-being. In the model, teachers with greater social-emotional competence and well-being were more likely to develop and maintain supportive teacher-student relationships and effective classroom management. Socially and emotionally competent teachers have the following qualities: greater self-awareness and social awareness, realistic understanding of their capabilities, recognition of their emotional strengths and weaknesses, good understanding of emotions of others, as well as prosocial values. Furthermore, these teachers are better at managing their emotions, behavior, and relationships with others, and can regulate their emotions in healthy ways that facilitate positive classroom outcomes without compromising their health.

When we think about teacher education and professional development programs in general, they do not assist teachers in developing skills such as mindful emotion regulation or attitudes such as self-compassion that can be used to address stressful aspects of teachers’ work (Roeser et al. 2012). A considerable body of evidence with adults indicated that mindfulness, defined as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn 1994, p. 4), can support emotion regulation, reduce stress, and consequently improve their health and well-being (Carmody and Baer 2008; Grossman et al. 2004).

Roeser et al. (2013) elaborated that mindfulness involves three interrelated mental skills and dispositions: (1) focusing attention intentionally on the here and now, (2) perceiving situations and engaging in actions with conscious awareness, and (3) experiencing each moment just as it is, in a nonjudgmental way. Moreover, mindfulness is sometimes described in terms of an attitude of warmhearted curiosity towards the present (Cullen 2011). Roeser et al. (2013) noted that self-compassion reflects an attitude of warmhearted curiosity towards self. Neff (2003) described self-compassion as (1) mindful self-awareness, (2) a suspension of self-judgment and criticism in favor of self-kindness and acceptance, and (3) an understanding of the universal nature of challenge, setbacks, and difficulty in human existence. Enhanced self-compassion can reduce negative self-appraisals of an individual's teaching competence and thus increase self-efficacy (Neff 2003). Similarly, greater self-compassion can act as an effective emotion regulation strategy by responding to negative affective states with kindness rather than criticism (Hölzel et al. 2011).

Recently, there has been growing interest in using MBIs to help teachers address job stress and burnout through intentional training in mindfulness and self-compassion (Roeser et al. 2012). The initial results of MBIs specifically designed for teachers have shown promise for promoting teachers' social and emotional competencies and reducing occupational stress. For example, Roeser et al. (2013) conducted a study of MBIs with elementary and secondary school teachers from Canada and the USA. Teachers randomized to the mindfulness intervention showed greater mindfulness, focused attention, working memory capacity, occupational self-compassion, and lower levels of occupational stress, and burnout at post-intervention and follow-up, than did those in the control condition. Furthermore, mindfulness and occupational self-compassion partially mediated the stress-reduction impacts over time. In previous studies of MBIs, significant effects also have been found on measures of self-compassion (Beshai et al. 2016; Flook et al. 2013; Roeser et al. 2013). Based on their review, Emerson et al. (2017) hypothesized that through participation in mindfulness training, teacher gains in both mindfulness (e.g., decentering, regulation of attention) and self-compassion (Hölzel et al. 2011) lead to more effective emotion regulation strategies and increased professional self-efficacy and ultimately reduced stress (e.g., Carmody and Baer 2009; De Vibe et al. 2012). However, interpretation and generalizability of results of MBIs designed for teachers have been limited by both small samples and lack of sufficient follow-up (Beshai et al. 2016; Flook et al. 2013; Franco et al. 2010; Frank et al. 2015; Jennings et al. 2013; Poulin et al. 2008; Taylor et al. 2016a, b).

In order to provide more objective measurement of the mindfulness interventions' impact on a level of stress, researchers are more frequently using physiological measures

of stress like blood pressure and heart rates (Harris et al. 2016; Roeser et al. 2013). Although stress has a psychological origin, it affects several physiological processes in the body. When a person is exposed to a stressor, the autonomic nervous system is triggered such that the sympathetic nervous system is activated and the parasympathetic nervous system is suppressed (Akselrod et al. 1981). This results in secretion of epinephrine and norepinephrine hormones into the bloodstream which leads to vasoconstriction of blood vessels, increased blood pressure, increased muscle tension, and changes in heart rate and heart rate variability (Taelman et al. 2009). Slow breathing contributes to the decrease of heart rate by decreasing activities of both sympathetic and parasympathetic nervous systems, which can affect blood pressure (Mourya et al. 2009).

Cultivating Awareness and Resilience in Education (CARE for Teachers program) is a specifically designed program focused on enhancing teachers' social and emotional competences (Jennings et al. 2017). The intervention model hypothesizes that increasing teachers' adaptive emotion regulation through an MBI will reduce psychological and physical distress and promote improved classroom interactions. To date, four quantitative studies on CARE for Teachers have been conducted in the USA. The first two studies were pilot studies of CARE for Teachers program feasibility, attractiveness, and efficacy (Jennings et al. 2011). The first study involved 31 educators from a high-poverty urban setting. The second study was conducted with student teachers and their mentor teachers working in suburban/semi-rural schools ( $n = 43$ ). Analyses showed that educators working in urban schools achieved significant pre-post improvements in mindfulness and time urgency after participating in a program. In a third study, teachers were randomly assigned to CARE ( $n = 23$ ) or a wait-list control group ( $n = 27$ ). Compared with controls, teachers who received CARE demonstrated significant improvements in emotion regulation, mindfulness, and teaching efficacy, and reductions in time-related stress, and physical symptoms associated with stress (Jennings et al. 2013). The most recent study of CARE involved a large cluster randomized trial design of 224 New York City teachers from 36 urban elementary schools (Jennings et al. 2017). Analyses showed that CARE had statistically significant effects on improving adaptive emotion regulation and mindfulness and reducing psychological distress and time urgency. The program also had a statistically significant positive effect on the emotional support domain of the CLASS-classroom observation measure of interactions between teachers and students (Pianta et al. 2008). The study showed that CARE for Teachers was effective in promoting teachers' social and emotional competence and increasing the quality of their classroom interactions. 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 (Jennings et al. 2019).

The primary goal of this study was to assess the effectiveness of the CARE program implementation outside of the USA, in Croatia, using self-report measures and collection of physiological data. We hypothesized that educators and school personnel who were randomly assigned to receive the CARE for Teachers program would show statistically significant improvements in mindfulness, self-compassion, and compassion just as reductions in burnout, compared with those from the waitlist condition. We have also hypothesized that educators and school personnel trained in CARE for Teachers would show statistically significant improvements in their physiological health.

## Method

### Participants

The sample included 54 school personnel (81.5% female) from two public elementary schools in Zagreb, Croatia; 25 received CARE for Teachers training and 29 were in the control condition. The sample age ranged from ages 23 to 63 with a mean age of 42.55 ( $SD = 10.63$ ). Most participants were subject teachers (44.4%) while 29.6% were class teachers. A subject teacher is a teacher who teaches specific subject(s) like algebra, language, or geography from the fifth until the eighth grade of the elementary and during the secondary school education. A class teacher is a teacher who teaches children from the beginning of their first grade until the end of the fourth grade of the elementary school education.

The sample also included seven (13%) school counselors, five (9.3%) administrators, and two (3.7%) school cooks. Educationally, 68.6% reported having a master's degree, 18.5% bachelor's, and 5.6% post-bachelor's degrees, and 7.4% had high school diplomas. Half of the participants had more than 15 years of experience of working in education system, 13% from 10 to 15 years, 31.5% had 3 to 10 years' experience, while 5.6% had less than 3 years' experience. Only 4% of participants had previous experience with mindfulness or stress reduction programs. Regarding blood pressure medications, 11% reported taking them regularly.

### Procedures

The research was approved by the Institutional Review Ethical Board of the Faculty of Education and Rehabilitation Sciences at the University of Zagreb, Croatia, that confirmed that all ethical principles were considered. While obtaining written, informed consent from teachers and other school employees, they were introduced to the main aspects and

procedures of this study. The study has been planned and conducted in a way that it should not cause any harm to participants. Anonymity and confidentiality were important aspects of this study so the independent assessors have collected data; teachers' answers were coded and used only for the purpose of this study. During the non-ambulatory collection of cardiovascular data, teachers' privacy has been respected in a way that this part of the research has been conducted with each teacher individually. With support from the Education Department of the City of Zagreb, two elementary schools were selected to participate and were randomly assigned to intervention and control conditions. All employees from both schools were informed about the project during the school meetings organized by the research team and invited to voluntarily participate in the study. Altogether, 25 employees from intervention and 29 from control school gave their written consent to participate.

Baseline data were collected in September 2016. Participants completed the self-report measures in a group setting at each school while non-ambulatory blood pressure monitoring (non-ABPM) and heart rate monitoring were collected individually. Participants were compensated monetarily for their time completing assessments. During September 2016, participants from the intervention school were introduced to CARE training. Post-test was conducted in November 2016 using the same self-assessment measures ( $n = 22$  intervention;  $n = 27$  control) and repeated non-ABPM ( $n = 20$  intervention;  $n = 25$  control). In January 2017, a 1-day booster session was held with participants in the CARE condition. Follow-up data were collected 6 months after the intervention, in March 2017. The follow-up assessment can provide us the insight into the possible long-term effects of the intervention and maintenance of the effects. Considering the nature of most of the observed outcomes (Davidson and Kaszniak 2015; Hill et al. 2016) particularly those of teachers' cardiovascular health, it was expected that developing and building the skills that would lead to these changes required a certain period of teachers' usage of learned mindfulness practices in their life. More and more mindfulness studies with adults conduct follow-up assessments since there is a need to better understand the developmental pathways of mindfulness and related phenomena.

### Intervention

One of the program's developers (Christa Turksma) delivered the CARE for Teachers training in 30 h over five in-person training days (6 h each). The intervention began in September 2016 with a 2-day weekend session (12 h) followed by a 2-day session a week later. In January 2017, a trained facilitator (first author) presented a 1-day booster session. The program consisted of emotion skills instructions; mindful awareness and stress reduction practices; and compassion, caring, and

listening practices. Emotion skills instructions consisted of themes and practices including introduction to emotions (purpose, universal emotion expressions, relevant brain research), exploring bodily awareness of emotions, and practicing how to use mindful awareness and reflection to recognize and manage strong emotions. Mindful awareness practices included breath awareness practice, mindful walking and stretching, mindfulness of thought and emotions, maintaining mindful awareness in front of a group, and role plays to practice mindfulness in a context of classroom situations. Different caring practices and mindful listening partner practices were parts of the compassion component of this program (Jennings et al. 2011, 2013). CARE is a structured program in which material is introduced sequentially, utilizing a combination of didactic, experiential, and interactive learning processes. The time between sessions gave participants opportunity for reflection, practice, and application of the material to their teaching and interactions with others. Program attendance was high with 92% of the participants who attended at least 4 of the 5 days of the program.

It might be important to stress that Croatia is predominantly a Catholic country with 87% of the population identifying themselves as Catholic. Because of that, introducing the mindfulness practices has been done with the particular respect and attention in this study. During the intervention, it was important to stress and explain that the CARE program promotes mindfulness as a secular practice and that practicing it is not in a conflict with some of the teachers' religious beliefs. Furthermore, since mindfulness was a rather new term for most of the teachers involved, they preferred using more familiar terms like “anti-stress” or “relaxation” practices.

## Measures

Participants completed a battery of self-report measures to assess mindfulness, burnout, self-compassion, and compassion. Measures were selected based on previous CARE studies conducted in the USA and the CARE logic model that proposed that the program would positively impact mindfulness, psychological distress, and physiological regulation.

### Mindfulness

Mindfulness was assessed through the Five Facet Mindfulness Questionnaire—FFMQ (Baer et al. 2006). This 39-item instrument has five subscales: *observing* (8 items, e.g., “When I’m walking, I deliberately notice the sensations of my body moving”), *describing* (8 items, e.g., “I’m good at finding words to describe my feelings”), *acting with awareness* (8 items, e.g., reversed item: “When I do things, my mind wanders off and I’m easily distracted”), *nonjudgmental* (8 items, e.g., reversed item: “I tell myself I shouldn’t be feeling the way I’m feeling”), and *nonreactive* (7 items, e.g., “I perceive

my feelings and emotions without having to react to them”). Respondents were asked to indicate the extent to which various statements are generally true for them on a 5-point Likert scale (1 = “never or rarely true” to 5 = “very often or always true”). Higher score reflects higher level of the observed construct. Internal consistency for the subscales in this study was as follows:  $\alpha = .73$  for observing;  $\alpha = .87$  for describing;  $\alpha = .84$  for acting with awareness;  $\alpha = .73$  for nonjudgmental; and  $\alpha = .65$  for nonreactive.

### Burnout

The Maslach Burnout Inventory—MBI (Maslach et al. 1997) is a 17-item scale designed to assess burnout syndrome in teachers, as characterized by high levels of *emotional exhaustion* (9 items, e.g., “I feel burned out from my work”) and low levels of *personal accomplishment* (8 items, e.g., “I deal very effectively with the problems of my students”). All items were rated on a 7-point Likert scale, with response options ranging from “never” to “every day”. Higher scores indicate greater emotional exhaustion (and hence more burnout) and greater personal accomplishment (and hence less burnout). Internal consistency of the scale in this study was  $\alpha = .90$  for emotional exhaustion and  $\alpha = .81$  for personal accomplishment.

### Self-Compassion

The Self-Compassion Scale-Short Form—SCS-SF (Raes et al. 2011) consists of 12 self-report items on a 5-point Likert scale with 1 indicating almost “never” and 5 indicating “almost always.” This instrument measures three facets of self-compassion and their opposites, including *self-kindness* (2 items, e.g., “When I’m going through a very hard time, I give myself the caring and tenderness I need”), *self-judgment* (2 items, e.g., “I’m disapproving and judgmental about my own flaws and inadequacies”), *common humanity* (2 items, e.g., “I try to see my failings as part of the human condition”), *isolation* (2 items, e.g., “When I fail at something that’s important to me, I tend to feel alone in my failure”), *mindfulness* (2 items, e.g., “When something upsets me I try to keep my emotions in balance.”), and *over-identification* (2 items, e.g., “When I’m feeling down I tend to obsess and fixate on everything that’s wrong”). Higher scores on subscales indicate higher level of observed construct. Internal consistency in this study was high for the overall scale ( $\alpha = .81$ ) and acceptable for most subscales (ranging from  $\alpha = .62$  for isolation to  $\alpha = .76$  for self-judgment) but somewhat low for common humanity ( $\alpha = .53$ ) due to few items.

### Compassion

The Compassion For Others Scale—CS (Pommier 2011) is a 24-item measure which consists of six subscales: *kindness* (4

items, e.g., “I like to be there for others in times of difficulty”), *indifference* (4 items, e.g., reversed item “Sometimes I am cold to others when they are down and out”), *common humanity* (4 items, e.g., “Everyone feels down sometimes, it is part of being human”), *separation* (4 items, e.g., reversed item “I don’t feel emotionally connected to people in pain.”), *mindfulness* (4 items, e.g., “I notice when people are upset, even if they don’t say anything”), and *disengagement* (4 items, e.g., reversed item “I don’t think much about the concerns of others”). Participants respond to items on a 5-point Likert scale (1 = “almost never” to 5 = “almost always”) with higher scores indicating higher level of observed construct. In this study, internal consistency was high for the total scale ( $\alpha = .85$ ) and adequate for three of the six subscales ( $\alpha = .65$  for kindness and mindfulness;  $\alpha = .68$  for common humanity), but relatively low for three of the subscales ( $\alpha = .39$  for indifference;  $\alpha = .53$  for separation;  $\alpha = .44$  for disengagement).

### Physiological Health

We assessed participants’ blood pressure (BP) and heart rates (HR) since the high BP is found to be a correlate of stress (Dimsdale 2008). BP measures the pressure in the arteries at the beginning (systolic) and end (diastolic) of the cardiac cycle in millimeters of mercury (mmHG) (Perloff et al. 1993). Resting HR was measured as the number of beats per minute (bpm) of the heart when one is at rest, with higher scores potentially indicative of great stress and cardiovascular risk (Fox et al. 2007). For each participant, BP and HR were measured two times repeatedly on the same occasion (before the start of the school day) and averaged for more accurate measurement. A digital heart rate blood pressure monitor was used to assess these parameters.

### Data Analyses

We first conducted preliminary analyses to examine descriptive and distributional statistics, correlations, and attrition rates and missing data patterns. To test for differential attrition rates across the intervention and control conditions, we used chi-square tests. To examine attrition-by-intervention interactions on baseline outcome measures, we conducted a series of two-way analyses of variance (ANOVA). We also examined whether the intervention and control groups were equivalent in terms of baseline measures and demographic characteristics. For the primary analysis evaluating CARE impact, each outcome variable was checked for linearity, homoscedasticity, and normality of residuals by inspecting a plot of residuals versus predicted values and a normal probability plot. The results indicated that the required assumptions were not seriously violated in any instance; hence, a linear regression model was estimated for each post-test and follow-up outcome. The models included the intervention status as a predictor

and baseline score as a covariate. Any baseline characteristics that differed across the groups and might be related to the outcomes were also included as additional controls. Lastly, we conducted moderation analyses examining whether the impacts of the CARE intervention differ by participants’ baseline performance by adding an interaction term between the group status and baseline outcome scores. We used *Mplus* version 7.2 (Muthén and Muthén 1998-2012) for primary analyses. Maximum likelihood estimation was used to handle missing data assuming that the data are missing at random (Little and Rubin 2002). The statistical significance of results was determined at the level of  $p < .05$ . To determine practical significance of results, we calculated effect size, Cohen’s  $d$ , as the adjusted group mean difference divided by the pooled standard deviation (Cohen 1988). Absolute values of Cohen’s  $d \geq 0.2$ ,  $\geq 0.5$ , and  $\geq 0.8$  are interpreted as small, medium, and large effects, respectively. We also reported an improvement index as an additional indicator of practical significance. As described in the *What Works Clearinghouse Procedures Handbook* (Institute of Education Sciences 2020), the improvement index was calculated by first converting a given effect size to a U3 value, i.e., the proportion of the area under the normal distribution below the effect size, and then subtracting 50% from the U3 value. This index represents the difference in the percentile rank between an average CARE teacher and an average control teacher.

## Results

### Preliminary Analysis

The analysis of baseline equivalence indicated that the intervention and control groups did not significantly differ on any baseline self-report or cardiovascular measures. The groups were also comparable in terms of background characteristics (age, gender, marital status, education degree, work experience in education and in the current school) but differed on profession type with a higher number of class teacher in the intervention group and a higher number of subject teachers in the control group,  $\chi^2(4, n = 54) = 10.27, p < .05$ . Thus, we included dummy indicators of a professional type, i.e., class teacher and subject teacher (all others as a reference group, including counselor and administrator), as additional controls. Table 1 displays descriptive statistics of participants’ baseline demographic characteristics by group. Table 2 and Table 3 present descriptive statistics of participants’ self-reported well-being and burnout scales and cardiovascular measures at baseline, post, and follow-up by the intervention and control status.

Total attrition rates were low, 11.1% ( $n = 6$ ) at post-test and 16.7% ( $n = 9$ ) at follow-up. Of the 25 participants who initially engaged in the CARE intervention, 3 participants dropped out from the study prior to post-test assessments. Of the 29

**Table 1** Descriptive statistics of participants' baseline demographic characteristics by group

	Intervention ( <i>n</i> = 25)		Control ( <i>n</i> = 29)	
	Valid, <i>n</i>	% or mean (SD)	Valid, <i>n</i>	% or mean (SD)
Age	24	42.54 (10.62)	29	42.55 (10.82)
Gender				
Female	20	80.0	24	82.8
Marital status				
Married	15	60.0	15	51.7
Education degree				
High school	0	0.0	4	13.8
Some college	7	28.0	3	10.3
Bachelor degree	2	8.0	1	3.4
Masters	16	64.0	21	72.4
Profession type				
Class teacher	12	48.0	4	13.8
Subject teacher	7	28.0	17	58.6
Counselor	4	16.0	3	10.3
Administrator	2	8.0	3	10.3
Other	0	0.0	2	6.9
Working experience				
Less than 3 years	2	8.0	1	3.4
3 to 10 years	7	28.0	10	34.5
10 to 15 years	3	12.0	4	13.8
More than 15 years	13	52.0	14	48.3
Working in this school				
Less than 3 years	1	4.0	4	13.8
3 to 10 years	7	28.0	10	34.5
10 to 15 years	5	20.0	1	3.4
More than 15 years	11	44.0	14	48.3

participants who were randomized into the control condition, 3 did not complete any post-test assessments. At follow-up, 7 teachers from the intervention group and 2 from the control group did not complete follow-up assessments. The attrition rates did not differ between groups at post,  $\chi^2(1, n = 54) = 0.04, p = .847$ , but there was more attrition of intervention participants at follow-up,  $\chi^2(1, n = 54) = 4.31, p < .05$ . Examination of attrition-by-intervention interactions indicated no significant interaction between intervention conditions and attrition status at post on any of the baseline outcome measures. Significant interactions between intervention and attrition status at follow-up were found for only two baseline outcomes: appraisal of distress was higher among remainders than attritors within the control group while the opposite was the case for the intervention group,  $F(1, 50) = 6.16, p < .05$ ; and indifference (a subscale of compassion) showed the same pattern of interaction,  $F(1, 50) = 4.21, p < .05$ . Overall, the results suggest that the potential for bias due to differential attrition should be minimal. We found no other systematic patterns of missing data.

## Primary Analysis

**Main Effects of Intervention on Self-Report Outcomes** At post-test, CARE intervention had significant positive effects on self-compassion ( $p = .038, d = 0.35$ ) and two of its subscales, common humanity ( $p = .049, d = 0.49$ ) and mindfulness ( $p = .006, d = 0.66$ ). The effect size estimates of 0.35, 0.49, and 0.66 represent small-to-medium effects, and translate into improvements of 13.68%, 18.79%, and 24.54% for total self-compassion, mindfulness, and common humanity, respectively. The results indicate that if the typical teacher in the control condition had received the CARE intervention, they would have improved approximately 13.7, 18.8, and 24.5 percentile points on overall self-compassion, mindfulness, and common humanity, respectively. However, there were no significant effects on mindfulness, burnout, and compassion measures at post-test. Table 4 presents the results of the main effects of the CARE intervention on participants' self-reported well-being and burnout outcomes measured at post and follow-up.

**Table 2** Participants’ self-reported well-being and burnout scales by intervention and control status

	Alpha	Baseline				Post				Follow-up			
		Intervention		Control		Intervention		Control		Intervention		Control	
		<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)
<b>Mindfulness</b>													
Observing	0.73	3.24	(0.59)	2.99	(0.61)	3.40	(0.74)	2.95	(0.74)	3.41	(0.65)	2.93	(0.68)
Describing	0.87	3.62	(0.69)	3.97	(0.60)	3.68	(0.62)	3.92	(0.72)	3.63	(0.62)	3.84	(0.68)
Acting with awareness	0.84	3.47	(0.75)	3.74	(0.69)	3.42	(0.75)	3.65	(0.69)	3.39	(0.66)	3.57	(0.67)
Non-judging	0.73	3.19	(0.63)	3.48	(0.64)	3.16	(0.64)	3.54	(0.79)	3.21	(0.66)	3.48	(0.74)
Non-reacting	0.65	3.30	(0.44)	3.16	(0.63)	3.20	(0.64)	3.18	(0.62)	3.20	(0.50)	3.15	(0.61)
<b>Self-compassion</b>													
Total	0.81	3.31	(0.73)	3.47	(0.54)	3.55	(0.69)	3.41	(0.50)	3.55	(0.65)	3.33	(0.52)
Self-kindness	0.68	3.52	(0.78)	3.67	(1.13)	3.75	(0.84)	3.67	(0.80)	3.89	(0.72)	3.56	(0.70)
Self-judgment	0.76	2.84	(1.07)	2.60	(0.92)	2.70	(1.01)	2.60	(1.12)	2.83	(1.01)	2.70	(0.99)
Common humanity	0.53	3.50	(0.76)	3.40	(0.94)	3.82	(0.87)	3.23	(0.98)	3.92	(0.69)	3.37	(0.80)
Isolation	0.62	2.92	(0.83)	3.09	(1.16)	2.89	(0.90)	2.98	(0.85)	2.83	(1.00)	3.09	(0.90)
Mindfulness	0.67	3.80	(0.85)	4.21	(0.65)	4.09	(0.67)	3.90	(0.63)	4.00	(0.75)	3.89	(0.63)
Over-identified	0.66	3.16	(1.16)	2.79	(0.93)	2.75	(1.09)	2.77	(0.82)	2.86	(0.87)	3.04	(0.78)
<b>MBI</b>													
Emotional exhaustion	0.90	29.90	(11.12)	30.04	(11.32)	28.53	(10.16)	30.04	(10.07)	25.40	(10.18)	29.02	(8.50)
Personal accomplishment	0.81	42.73	(7.24)	43.56	(9.92)	43.53	(6.04)	44.68	(8.27)	44.83	(8.57)	45.00	(6.55)
<b>Compassion</b>													
Total	0.85	4.08	(0.42)	4.03	(0.49)	4.14	(0.43)	3.98	(0.49)	4.12	(0.38)	3.89	(0.50)
Kindness	0.65	4.13	(0.64)	4.21	(0.74)	4.26	(0.56)	4.23	(0.53)	4.35	(0.56)	4.00	(0.49)
Indifference	0.39	1.99	(0.58)	2.09	(0.50)	1.97	(0.57)	2.08	(0.65)	1.96	(0.50)	2.16	(0.72)
Common humanity	0.68	4.37	(0.60)	4.21	(0.69)	4.33	(0.53)	4.12	(0.71)	4.22	(0.58)	3.99	(0.89)
Separation	0.53	2.02	(0.65)	2.09	(0.76)	1.98	(0.67)	2.21	(0.88)	2.06	(0.50)	2.22	(0.81)
Mindfulness	0.65	4.08	(0.58)	4.16	(0.82)	4.15	(0.47)	4.08	(0.57)	4.10	(0.58)	4.12	(0.57)
Disengagement	0.44	2.11	(0.65)	2.20	(0.60)	1.98	(0.62)	2.24	(0.75)	1.92	(0.54)	2.39	(0.73)

No significant baseline differences between the groups were detected for any outcome variable

Effectiveness of the CARE intervention was generally more evident in the 6-month follow-up than at post-test. For example, CARE had significant impacts on overall self-

compassion and four of its six subscales at follow-up including self-kindness, common humanity, mindfulness, and over-identification. The effect sizes were moderate (0.50 to 0.73),

**Table 3** Participants’ cardiovascular data by intervention and control status

	Baseline				Post				Follow-up			
	Intervention		Control		Intervention		Control		Intervention		Control	
	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)	<i>M</i>	(SD)
<b>Blood pressure and heart rate</b>												
Systolic—average of the 1st and 2nd measurement	122.28	(14.83)	125.62	(20.02)	119.45	(10.20)	126.90	(17.77)	124.68	(9.34)	128.30	(21.08)
Diastolic—average of the 1st and 2nd measurement	76.48	(11.45)	79.24	(12.84)	71.13	(7.90)	76.98	(10.25)	75.95	(7.47)	77.85	(10.75)
Heart rate—average of the 1st and 2nd measurement	79.80	(10.56)	75.26	(11.48)	72.65	(7.64)	75.08	(9.97)	73.25	(10.35)	70.46	(8.05)

No significant baseline differences between the groups were detected for any outcome variable



**Table 4** Impacts of CARE on participants' self-reported well-being and burnout outcomes

	Post					Follow-up				
	<i>b</i>	(SE)	<i>p</i> value	<i>d</i>	Improvement index	<i>b</i>	(SE)	<i>p</i> value	<i>d</i>	Improvement index
<b>Mindfulness</b>										
Observing	0.32	(0.19)	0.096	0.43	17.00%	0.42	(0.18)	0.016	0.63	23.57%
Describing	−0.02	(0.16)	0.895	−0.03	−1.20%	0.08	(0.16)	0.609	0.12	4.78%
Acting with awareness	−0.04	(0.14)	0.788	−0.05	−2.00%	0.07	(0.16)	0.658	0.11	4.38%
Non-judging	−0.07	(0.16)	0.672	−0.09	−4.00%	0.05	(0.16)	0.742	0.08	3.19%
Non-reacting	−0.08	(0.14)	0.573	−0.13	−5.00%	0.05	(0.13)	0.709	0.09	3.59%
<b>Self-compassion</b>										
Total	0.21	(0.10)	0.038	0.35	13.68%	0.37	(0.12)	0.001	0.64	23.89%
Self-kindness	0.08	(0.19)	0.654	0.10	3.98%	0.39	(0.16)	0.015	0.55	20.88%
Self-judgment	−0.04	(0.25)	0.873	−0.04	−1.60%	−0.01	(0.29)	0.984	−0.01	−0.40%
Common humanity	0.46	(0.23)	0.049	0.49	18.79%	0.56	(0.20)	0.006	0.73	26.73%
Isolation	0.07	(0.20)	0.726	0.08	3.19%	−0.31	(0.24)	0.195	−0.33	−12.93%
Mindfulness	0.43	(0.16)	0.006	0.66	24.54%	0.38	(0.17)	0.025	0.56	21.23%
Over-identified	−0.14	(0.22)	0.510	−0.15	−5.96%	−0.41	(0.21)	0.047	−0.50	−19.15%
<b>MBI</b>										
Emotional exhaustion	0.02	(2.03)	0.990	0.00	0.00%	−3.12	(2.37)	0.188	−0.34	−13.31%
Personal accomplishment	−2.23	(1.44)	0.122	−0.30	−11.79%	−0.65	(1.84)	0.724	−0.09	−3.59%
<b>Compassion</b>										
Total	0.05	(0.10)	0.643	0.10	3.98%	0.18	(0.11)	0.094	0.39	15.17%
Kindness	−0.01	(0.15)	0.954	−0.01	−0.40%	0.32	(0.14)	0.018	0.62	23.24%
Indifference	0.08	(0.15)	0.603	0.12	4.78%	−0.08	(0.17)	0.644	−0.12	−4.78%
Common humanity	0.07	(0.17)	0.696	0.11	4.38%	0.06	(0.20)	0.778	0.07	2.79%
Separation	−0.28	(0.19)	0.134	−0.36	−14.06%	−0.15	(0.17)	0.384	−0.21	−8.32%
Mindfulness	0.03	(0.15)	0.868	0.05	1.99%	0.01	(0.15)	0.951	0.02	0.80%
Disengagement	−0.16	(0.17)	0.338	−0.23	−9.10%	−0.44	(0.18)	0.016	−0.67	−24.86%

*b* and SE indicate an unstandardized estimate of difference between conditions and its respective standard errors. *d* indicates Cohen's *d* effect size estimates

with improvement indices of 23.89%, 20.88%, 26.73%, 21.23%, and −19.15% for total self-compassion, self-kindness, common humanity, mindfulness, and over-identification, respectively. The results indicate that the average control teacher, if they had been assigned to the CARE group, would have experienced approximately 24, 21, 27, and 21 percentile point increase in total self-compassion, self-kindness, common humanity, and mindfulness, and over 19% decline in over-identification. We also found statistically significant effects of the CARE intervention on two of compassion subscales: kindness ( $p = .018$ ,  $d = 0.62$ ) and disengagement ( $p = .016$ ,  $d = -0.67$ ). These moderate effect sizes of 0.62 and 0.67 correspond to improvement indices of 23.24% and −24.86% for kindness and disengagement, respectively, indicating that if the average teacher in the control condition had been assigned to the CARE group, it would have led to about 23 percentile point improvement in kindness and almost 25 percentile point decline in disengagement. In addition, there was a significant positive effect of the intervention on one of mindfulness subscales, observing, with a

moderate effect size of 0.63 and an improvement index of 23.57%. No significant intervention effects were detected for burnout measures at follow-up.

**Main Effects of Intervention on Cardiovascular Measures** At post-test, CARE participants showed significantly lower HR ( $p = .020$ ,  $d = -0.60$ ) than those in the control group. Table 5 presents the results of the main effects of the CARE intervention on BP and HR measures. The effect size was moderate, with an improvement index of −22.57%, indicating that the typical control teacher would have experienced about 22.6 percentile point decline in HR had he/she been assigned to the CARE group. However, we found no significant intervention impacts on the values of systolic and diastolic BP at post. The CARE intervention produced no significant effects on the cardiovascular measures at follow-up.

**Moderating Effects of Baseline Performance** We found no significant moderation effects of baseline scores for any of

**Table 5** Impacts of CARE on participants' bio outcomes

	Post					Follow-up				
	<i>b</i>	(SE)	<i>p</i> value	<i>d</i>	Improvement index	<i>b</i>	(SE)	<i>p</i> value	<i>d</i>	Improvement index
Blood pressure and heart rate										
Systolic BP	−3.34	(3.22)	0.299	−0.22	−8.71%	1.16	(3.45)	0.736	0.07	2.79%
Diastolic BP	−2.41	(2.21)	0.276	−0.26	−10.26%	0.49	(2.32)	0.832	0.05	1.99%
Heart rate	−5.43	(2.33)	0.020	−0.60	−22.57%	−0.44	(2.52)	0.862	−0.05	−1.99%

*b* and SE indicate an unstandardized estimate of difference between conditions and its respective standard errors. *d* indicates Cohen's *d* effect size estimates

participants' self-report well-being and burnout measures and cardiovascular measures.

## Discussion

This study has shown that the introduction of the CARE for Teachers program to a group of educators in Croatia had positive impacts on several indicators of their well-being and cardiovascular health. The extent of the impacts varied across the post-test and the follow-up.

The post-test results indicated that CARE participants showed higher scores on self-compassion and two of its subscales, common humanity and mindfulness. Although this construct was not assessed within the previous USA CARE studies, it fits the logic model that mindfulness practice has positive impacts on teachers' tendency to be compassionate towards themselves, as have been found with other MBIs for teachers (Beshai et al. 2016; Flook et al. 2013; Roeser et al. 2013; Taylor et al. 2016b). Interestingly, no significant effects were found for mindfulness (on the FFMQ), burnout, or compassion at the post-test. The previous CARE studies showed positive effects of program on teachers' mindfulness (Jennings et al. 2013, 2017). Furthermore, Jennings et al. (2017) found significant positive effects of the CARE program on emotional exhaustion component of burnout ( $d = -.22$ ) in their USA study. In the USA study, there was a several weeks break in between sessions which may have given teachers greater opportunity for practice, reflection, and application of the material to their teaching while teachers in the Croatian study had only 1 week between training sessions which might have affected the program outcomes. From a perspective of cultural differences, it is important to stress that for most of the Croatian teachers, this study was their first experience with mindfulness practice. Also, meditation is often perceived as an Eastern religious practice and for that reason not promoted in Croatian society in general.

Positive impacts of the CARE program on self-reported measures were greater at follow-up. Six months post-intervention, CARE participants reported significantly higher levels of overall self-compassion and its subscales: self-kindness,

common humanity, and mindfulness. They also reported significantly lower levels of over-identification. Thus, developing self-kindness and avoiding over-identifying with feelings of inadequacy required more time for expression. In a randomized trial of the SMART Program, improvements in teacher's occupational self-compassion also continued at 3-month follow-up (Roeser et al. 2013).

In the present study, at the follow-up, several additional effects of CARE were detected: a marginally significant positive effect on the overall compassion scale and significant effects on improvement on the subscales of kindness and decline in disengagement. Interestingly, participants' capacity to express compassion towards others also becomes more evident at 6 months of follow-up as compared with post-test. This study supports the idea that in order to be able to express compassion towards others, one needs to be compassionate towards himself/herself first.

Regarding the mindfulness outcomes at the follow-up, there was a significant positive effect of the intervention on one of the mindfulness subscales, observing. In the larger, 9.5-month follow-up study of CARE program conducted by Jennings et al. (2019), 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. Teachers exposed to CARE reported even greater gains in the observing and also in the non-judging components of mindfulness over one full school year relative to control teachers. In their systematic review of MBIs with teachers, Emerson et al. (2017) reported that the majority of studies consistently found significant effects on the subscale observing (Flook et al. 2013; Frank et al. 2015; Poulin et al. 2008). The same trend was found at the post-test in previous CARE studies from the USA (Jennings et al. 2011, 2013). It seems that Croatian school professionals needed certain time to further develop their tendency to notice internal and external experiences and to integrate it more comprehensively into their daily lives.

For cardiovascular measures at post-test and follow-up, CARE participants showed significantly lower average heart rates than those in the control group. No significant intervention impacts on the values of systolic and diastolic blood

pressure at post or at follow-up were found. The CARE program is designed to help teachers regulate their emotional reactivity in stressful situations through mindful awareness of their emotional experience, noticing the physical sensations and thoughts associated with their reactions and when needed, taking a few deep breaths (Jennings et al. 2013). Mindful breathing is one of the main techniques which teachers practice during the CARE program. The CARE had a beneficial impact on school personnel heart rates soon after the training which might have been the result of more quality breathing since breathing quality can decrease heart rate through sympathetic and parasympathetic nervous systems (Mourya et al. 2009). However, the impact was not sufficient to affect their blood pressure values or to maintain lower heart rates for 6 months following the intervention. Although the effects of different meditation techniques on stress relief and blood pressure reduction have been evaluated over the past 20 years (Shi et al. 2017), only recently researchers have examined MBI's impact on teachers' cardiovascular health. In the SMART trial, Roeser et al. (2013) found no significant impact on blood pressure and heart rates at post-test. However, Harris et al. (2016) who studied the CALM (Community Approach to Learning Mindfully) found that this daily school-based MBI had significant impact on educators' blood pressure. CALM participants showed a significant lowering of their DBP compared with controls ( $d = -0.52$ ), but the effect for SBP was non-significant. In their meta-analysis of the effects of different meditation practices on blood pressure, Shi et al. (2017) have stated several reasons that might explain mixed results of this interventions' impact on participants' blood pressure. Some of these were a quantity and quality of meditation practice during and after intervention, a type of blood pressure measurement (ambulatory vs. non-ambulatory blood pressure measurement), and the age effect (older participants might benefit more on the blood pressure reduction with non-ambulatory blood pressure measurement).

### Limitations and Future Research

Although participants of the CARE program demonstrated significant effects on several hypothesized self-report and cardiovascular health outcomes, small sample size of this study reduced the power and generalizability of the findings and may underestimate program impacts. Initiating larger sample size studies of MBIs for educators is very much needed. Another limitation of the presented study is that school personnel participated in the CARE program voluntarily; the results might be different if program participation was mandatory. Studies with more diverse samples of educators from Croatia and other countries and educational contexts could offer more understanding of the mechanisms affecting the impact of MBIs for educators. Also, another limitation is the reliance on self-reported measures. In the future, it would also

be worthwhile to include observations of teachers' behavior in the classrooms by independent observers as well as assessments of teachers by students (Jennings et al. 2017).

Additionally, although teachers' heart rates were reliably measured via digital heart rate blood pressure monitor, Shi et al. (2017) stressed the need for more of an ambulatory blood pressure monitoring to examine the benefit of meditation intervention on blood pressure reduction. Furthermore, in the present study, teachers' blood pressure was measured for each participant two times repeatedly on the same occasion (pre-post and at the follow-up) before a school day. Besides morning assessment of teachers' BP, afternoon measures of their BP would provide more information on possible BP changes due to work stress. Berntson et al. (1997) stressed that an even more reliable measure of parasympathetic nervous system activity would be the high-frequency heart rate variability (HF-HRV). For that reason, future studies of MBIs focused on cardiovascular health changes among educators might also consider including that measure. Additionally, measuring some other indicators of teachers' physiological stress, such as cortisol level, would provide more information on teachers' stress responses.

This study has shown that the implementation of the CARE program outside of the USA had a positive impact on some of the aspects of school personnel's well-being and that it could be considered a promising intervention to support teachers and other school professionals. Likewise, this study points to the possible benefit of this intervention on cardiovascular health of program participants. Given these promising results, further and more complex research of the mindfulness-based social-emotional learning interventions impact on educators is needed.

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**Compliance with Ethical Standards** All procedures performed in this study were in accordance with the ethical standards of the Institutional Review Ethical Board of the Faculty of Education and Rehabilitation Sciences, University of Zagreb, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Written consent was obtained from all individual participants included in the study.

**Conflict of Interest** CARE for Teachers training was conducted by Mark Greenberg's partner, Christa Turksma, program creator. No other authors have any conflicts of interest.

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