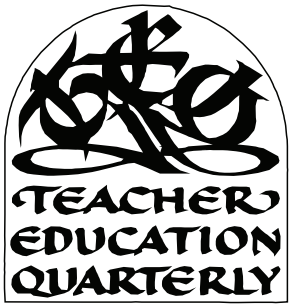

Effects of Loving Kindness Meditation on Student Teachers' Reported Levels of Stress and Empathy

Imre Emeric Csaszar,
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To be effective, teachers need to have empathic relationships with students based on respect, caring, and an overall understanding that relationships in schools are vital to a positive learning community (Cooper, 2003; Jennings & Greenberg, 2009; Ray, Lambie, & Curry, 2007). However, teacher stress may lead to negative consequences that undermine teachers' ability to sustain personal health and positive relationships with students. Thus teacher stress is of growing concern to researchers.

Teacher Stress

Stress is an ordinary part of everyday life. According to Selye (1978), stress is a condition that forces physical and/or psychological burden(s) on a person. Based on a definition of stress offered by Lazarus and Folkman (1984), stress occurs when the demands of an individual's environment extend beyond the resources the indi-

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vidual has immediately available for coping with the demands. Furthermore, some stressors influence physical and psychological health (Lazarus & Folkman, 1984).

Teachers often experience high levels of stress as they face the demands and expectations of students, parents, administrators, and society (Kyriacou, 2001; R. G. Lambert & McCarthy, 2006). Relationships may present stressors to teachers working with other teachers, paraprofessionals, administrators, and school staff (Montgomery & Rupp, 2005). Students' behavior (Admiraal, Korthagen, & Wubbels, 2000; Geving, 2007), teachers' perceptions of school climate and workload (Collie, Shapka, & Perry, 2012), scarce resources combined with high demands (R. G. Lambert, McCarthy, O'Donnell, & Want, 2009), and challenging needs of diverse learners (Jones, Bouffard, & Weissbourd, 2013) are all potential stressors for educators. As stressors compile, many teachers may use adaptive coping strategies to reduce the effects of stress (i.e., exercise, nutrition, spiritual practices, social support, etc.; Myers, Sweeney, & Witmer, 2000).

Conversely, if teachers do not possess skills to positively adapt to stress, they may experience increased stress. Increased stress might lead to more negative outcomes, most notably, the experience of a pattern of emotional exhaustion progressing to burnout, decreased empathy toward others, feelings of fatigue, loss of compassion, becoming experientially avoidant (avoiding internal thoughts, feelings, and experiences), and reduced effectiveness, which can further exacerbate the stress teachers feel (Csaszar, 2012; Hinds, Jones, Gau, Forrester, & Biglan, 2015; Yu, Wang, Zhai, Dai, & Yang, 2015). Beyond these effects, stress can contribute to negative affect and lower self-control (Hamama, Ronen, Shachar, & Rosenbaum, 2013); for teachers, these effects of stress might contribute greatly to a negative classroom environment. Moreover, if stress becomes too overwhelming, teachers may experience lower job satisfaction and career commitment and may seek other employment opportunities (McCarthy, Lambert, & Reiser, 2014).

Empathy

Young (2013) noted that the word empathy is "related to the German word Einfuhlung, which means 'feeling oneself into' another person's experience. Empathy means you grasp the facts, feelings, and the significance of another person's story" (p. 58). An empathetic teacher attempts to understand, and has an inclination to comprehend, the lived experiences of his or her students. An empathic teacher accomplishes the tasks essential to complete the curricular activities required in the classroom but also has an appreciation for students as whole people. The empathic teacher is cognizant that learning is a contextual process; therefore students' lives and lived experiences are seen as relevant to learning, growth, and development. Boyer (2010) noted that caring and empathy are at the very core of teaching, as learning cannot progress without them. As Roeser, Skinner, Beers, and Jennings (2012) aptly contended, the dispositional qualities of a teacher, beyond empathy and compassion,

include nonjudgement, problem solving with concern for the student, reasonable flexibility, and regulation of one's own emotions during difficult situations. Conklin (2008) asserted that empathy and genuine caring are necessary for a justice-oriented approach to teaching. Therefore it appears that empathy and compassion are the necessary building blocks to other meaningful attributes of a caring teacher.

Smith (2006) contended that the relationship between teachers and students is the basis for effective student learning outcomes. Empathetic behaviors include listening, understanding, and accepting others; equally, empathy can lead to acts of compassion (Whang & Nash, 2005). Displaying empathy through acts of compassion conveys a message of caring to students and may contribute to students' feelings of mattering, the belief that we are an important part of the world around us, that we are valued by others (Elliott, Kao, & Grant, 2004). A person may feel that he or she matters in a relationship (such as when a student feels that he or she matters to the teacher) when the person is acknowledged and believes that another person has a vested interest in his or her welfare (Elliott, Cunningham, Colangelo, & Gelles, 2005). Empathy and compassion promote feelings of mattering. Indeed, Bloch (2009) noted that when students feel they matter, they feel a greater sense of cohesion and belonging in the school environment. Tucker, Dixon, and Griddine (2010) found that when students feel they matter, they experience increased academic motivation, particularly when facing scholastic struggles. This motivation might translate into greater task attempts, performance accomplishment, and efficacy. In a study conducted by Conner, Miles, and Pope (2014), even high-performing, high-achieving students who believe teachers care for them have significantly lower academic anxiety, internalizing symptoms (e.g., hopelessness), and physical problems related to school stress (i.e., sleep difficulties, headaches) than students who do not perceive they have teacher support and caring.

Mitigating Stress: Meditation

Meditation is a practice that might promote empathy and reduce stress. It has been practiced for more than 5,000 years (Walters, 2002) and has been traditionally associated with religious or spiritual growth, enlightenment, personal transformation, or transcendental experience (Perez-de-Albeniz & Holmes, 2000). However, the practice of meditation is becoming increasingly popular as a strategy to address a variety of problems in health care, business, and education (Duerr, 2004). Yet, despite its varied uses, defining what meditation actually is can be somewhat complicated.

Specifically, there is no consensus about the definition of meditation. The range of definitions reflects the complex nature of meditation as well as the varied historical traditions and perspectives from which the practice has evolved; these multiple perspectives have been used by many practitioners, scholars, theologians, and others to describe and explain characteristics of the practice (Shapiro & Carlson, 2009). From a psychological and cognitive perspective, meditation can be defined as "a family of self-regulation practices that focus on training attention and awareness

in order to bring mental processes under greater voluntary control and/or specific capacities such as calm, clarity and concentration" (Walsh & Shapiro, 2006, pp. 228–229). Most researchers agree that meditation implies a form of mental training that requires stilling or emptying the mind. All types of meditation practices seem to be based on (a) the concept of self-observation of immediate mental activity, (b) training one's level of awareness, and (c) cultivating an attitude of accepting the process rather than the content of an event (Shapiro & Carlson, 2009). There is growing evidence that this form of mental training can promote teacher well-being (Abenavoli, Jennings, Greenberg, Harris, & Katz, 2013; Anderson, Levinson, Barker, & Kiewra, 1999; Rockefeller, 2006; Sage, Adcock, & Dixon, 2012; Schuck & Haggerson, 1991) and effective teaching practices (C. Hill, Herndon, & Karpinska, 2006; Jennings, 2014; Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013).

Mindfulness and Loving Kindness Meditation

One form of meditation that can be particularly effective for teachers is called mindfulness. Kabat-Zinn (1994) described *mindfulness* as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience" (p. 145). Shapiro, Carlson, Astin, and Freedman (2006) developed a model describing three components of mindfulness: intention, attention, and attitude. The first, *intention*, refers to why someone is practicing meditation. The second is *attention*, defined as one's observing moment by moment internal and external experiences. The third component is *attitude*, a reference to how an individual participates in the practice (Shapiro et al., 2006).

A specific form of mindfulness, loving kindness meditation (LKM), includes those components, but adds the concept of *connectedness* (Leppma, 2012; Salzberg, 1995; Weibel, 2007). To be more pointed, while all meditations improve awareness of one's emotional states and emotion regulation, LKM is focused on the cultivation of positive emotion toward others (love, warmth, compassion). Therefore it has a more active component of gaining caring and goodwill for others than other forms of mindfulness (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Schneider & Keenan, 2015). During LKM, the meditator begins with thoughts of warmth, love, kindness, and compassion about himself or herself. From there, the practice is expanded to include people for whom the meditator feels gratitude; then to family, friends, and other loved ones. Next, the practice is generally expanded to include neutral people; next, people with whom the meditator has difficulty; and ultimately, all beings. This is how the component of connectedness is achieved. During the meditation, it is customary to silently repeat phrases or intentions of loving kindness (Fredrickson, 2002; Salzberg, 1995; Seppala, 2010; Weibel, 2007). Typical phrases are "may I be safe, may I be happy, may I be healthy, and may I live with ease." Other mindfulness practices focus on awareness of the present moment rather than the explicit cultivation of positive emotion, but both techniques

have been shown to decrease emotional distress (Baer, 2003; Beddoe & Murphy, 2004; Bishop et al., 2004; Brown, Ryan, & Creswell, 2007; Carson et al., 2005; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Hutcherson, Seppala, & Gross, 2008; Leppma, 2011; Shapiro, Brown, & Biegel, 2007).

The impact of meditation on teachers' stress symptomology. In a study of mindfulness-based stress reduction (MSBR) practice on the effects of stress for primary school teachers, E. Gold et al. (2010) found statistically significant improvements in anxiety, depression, and stress symptoms. Though the study sample was small (n = 11), the significance of the results are particularly noteworthy because none of the participants had prior experience with meditation practice before enlisting in the study. Furthermore, prior to participating in the study, the depression experienced by three of the participants met clinical criteria (severe or extremely severe) with numerous side effects presumably impacting their work as teachers, including impairment to self-confidence, concentration, and motivation (E. Gold et al., 2010).

Similarly, Roeser et al. (2013) conducted a randomized trial of the effects of mindfulness training (MT) on teacher stress. The researchers measured occupational stress, burnout, physiological stress, self-compassion, anxiety, and depression. The researchers assessed experimental and control group participants at baseline, postprogram, and follow-up. Participants in the experimental group participated in an 8-week, 11-session program, for a total of 36 contact hours. The intervention was held after school. All activities were designed to promote self-compassion and mindfulness and included two lectures, home practice activities, group discussions, and an emotions diary. The researchers found that for the experimental group, there was greater mindfulness, memory capacity, and occupational self-compassion as well as lower stress and burnout at postprogram compared with the control group. At follow-up, the experimental group had reductions in stress, burnout, symptoms of anxiety, and depression when compared to the control group, though no significant difference was found in physiological measures (Roeser et al., 2013).

Indeed, MT for teachers in reducing stress, mitigating burnout, improving mental health organization, and lowering anxiety and depression has been noted in recent studies as an emergent and promising practice (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; E. Gold et al., 2010; Roeser et al., 2013). However, none of the studies reviewed by the authors of the current study measured stress of *preservice* teachers in their student teaching. This research team conjectures that meditation and mindfulness practice could be paramount prior to leaving training programs as it might actually serve as a protective factor against stress for preservice teachers if implemented in training programs. The objective of this study was to evaluate the relationships between LKM and student teachers' reported levels of stress and empathy. Specifically, the researchers hypothesized that LKM would have a statistically significant positive relationship with teacher empathy and a statistically significant negative relationship with teacher stress.

Purpose of This Study

The difficulties student teachers experience are well documented (Chaplain, 2008). Among many contributing factors, stress is named as one of the primary concerns for student teachers. Indeed, there is some evidence that teacher burnout can be observed as early as the student teaching experience (Y. Gold & Batchelor, 1988). Stressors for student teachers include learning to adapt to the school culture (Feiman-Nemser, 2003), classroom management and fatigue (Fimian & Blanton, 1987), workload (Gardner, 2010), and role confusion (MacDonald, 1993). It is possible that meditation can reduce feelings of stress for student teachers. Furthermore, because the relationship between teachers and students has become recognized as a critical central component of teacher effectiveness (Clotfelter, Ladd, & Vigdor, 2006), this study also examines the relationship of LKM to student teacher levels of empathy.

Conceptual Framework

McCubbin and Patterson's (1983) double *ABCX model of family stressors and strains*, adopted from R. Hill (1958), served as the conceptual framework for this study. Within this framework, the *A* represents an initial stressor; *B* is the individual's or group's resources for meeting the demands of the stressor; and *C* stands for the individual's or group's perception of the stressor and the ability to cope with it. The ABC is considered precrisis if the individual or group has the coping resources to deal with the stressor and perceives that they can efficaciously deal with the stressor. The *X* is a person's or group's response to the stressor, which might include crisis if the demands of the stressors presented exceed available resources or the individual's or group's perception of their efficacy to deal with stressors (McCubbin & Patterson, 1983; Weber, 2011). In this study, preservice student teacher meditation is considered a resource at the precrisis stage, avoiding the development of a crisis and developing into an adaptive strategy, thus avoiding maladaptation and the compound effects of future crises. Alternatively, if the participants are already experiencing a crisis situation, meditation may provide them with a way of coping by altering their perception in a constructive and healthy way, adding to their bank of available resources. The basis of the current study was consideration of whether LKM might bolster precrisis resources within the context of the ABCX model. The following hypotheses were investigated using a randomized intervention trial:

H1: Is there a statistically significant difference in levels of reported stress between student teachers who participate in LKM and those who do not?

H2: Is there a statistically significant difference in levels of reported empathy between student teachers who participate in LKM and those who do not?

H3: Is there a correlation between the amount of time spent participating in LKM and the reported level of stress or empathy?

Research Design

This research was conducted using an experimental design with staggered multiple baselines and random assignment to control and experimental groups. Volunteers were assigned randomly to Group A, an experimental group, and Group B, a control group. Both groups participated in the intervention, but Group B began 6 weeks after Group A.

Sample

The sample was gathered from a population of student teachers at a large university in the southeastern United States (213 total student teachers) in the fall semester. The participants were enrolled in early childhood education, elementary education, and master's of arts in teaching programs. Initially, 73 student teachers volunteered to participate in the study, and 70 completed the study. These participants were randomly assigned to one of two groups, with 36 participants in Group A and 34 in Group B. The intervention began in the following spring semester.

Participant demographics. Of the 70 participants in the sample, 90% were women ($n = 63$) and 10% were men ($n = 7$). The mean age of participants was 24 years ($SD = 2.074$), with a range of 21–30 years. The reported racial composition of the overall sample included 78% White ($n = 55$), 9% Asian ($n = 6$), 6% African American ($n = 4$), 6% Latino/a ($n = 4$), and 1% Native American/Indian ($n = 1$). A majority of participants were student teaching in elementary ($n = 38$) and middle schools ($n = 28$); thus 89% were respectively placed at these grade levels. Furthermore, of the entire participant group, 5 % ($n = 3$) reported being placed in pre-K–3, and 6% ($n = 5$) reported placement in other grades (music, history, and physical education).

Intervention

After giving informed consent, Group A participants received training and materials. The training consisted of instruction about the history of meditation in general, including LKM, and a brief overview of the research about the benefits of meditation. During the training, participants were given a CD with six tracks of audio material from the University of California, Los Angeles's Semel Institute for Neuroscience and Human Behavior. One of the tracks provided step-by-step instructions for meditation, while the other tracks contained LKM meditations of varying lengths (approximately 6–30 minutes). Participants were asked to listen to any one of the tracks once a day and to record the time they spent meditating on the log sheet provided. In Week 6, Group B participants received the same training and materials and began the intervention. So Group A did the intervention for 12 weeks and Group B served as a control group until the first posttest (Week 6) and participated in the intervention for the second 6 weeks. All participants completed the Interpersonal Reactivity Index (IRI) and the Outcome Questionnaire 45.2 (OQ

45.2) at baseline (Week 0 preintervention), Week 6 (mid-intervention for Group A and preintervention for Group B), and Week 12 (postintervention for both groups). Thus Group A participated in the intervention for a total of 12 weeks; Group B participated in the intervention for the second 6 weeks only. This allowed comparisons of Group A and Group B with the intervention and without and then between groups with both receiving the intervention.

Instruments

Interpersonal Reactivity Index. The IRI measures two emotional factors and two cognitive factors: (a) fantasy, (b) perspective taking, (c) empathic concern, and (d) personal distress (Davis, 1980). The IRI is a 28-item questionnaire consisting of four discrete, 7-item subscales. Respondents indicated for each question how well the item described them on a 5-point Likert type scale ranging from 0 (*does not describe me well*) to 4 (*describes me very well*). The Fantasy subscale includes three items from Stotland's Empathy scale (Stotland, Mathews, Sherman, Hansson, & Richardson, 1978) and gauges the tendency to imaginatively transpose oneself into fictional situations (e.g., books, movies, daydreams). The Perspective Taking (PT) subscale measures the proclivity to shift perspectives when dealing with other people. The items composing this scale refer to "real-life" instances of PT. The other two subscales explicitly deal with individual differences in emotional responses to observed emotionality in others. The Empathic Concern (EC) subscale consists of items assessing the degree to which the respondent experiences feelings of warmth, compassion, and concern for someone else. The Personal Distress (PD) subscale measures feelings of fear, apprehension, and discomfort when witnessing negative experiences of others. This is a commonly used measure in psychological research, and reported alpha scores range from .73 to .83 for the scales, indicating good internal consistency (de Corte et al., 2007).

Outcome Questionnaire 45.2. The OQ 45.2 is a questionnaire designed to assess problems common to a wide variety of adult mental health concerns (M. J. Lambert, Gregersen, & Burlingame, 2004). The OQ 45.2 instructions direct respondents to answer the items on the basis of how they have felt over the past week. The instrument consists of 45 items with a 5-point Likert response scale ranging from 0 (*never*) to 4 (*almost always*). The OQ 45.2 has three subscales. The Symptom Distress subscale consists of 25 items that evaluate psychological symptoms associated with the most prevalent types of mental disorders among adults (e.g., anxiety disorders, mood disorders, depression). The Interpersonal Relations subscale consists of 11 items that attempt to assess functioning in interpersonal relationships. The Social Role Performance subscale consists of nine items that assess an individual's current level of social role performance. The test–retest reliability, internal consistency, and concurrent validity of this measure have been repeatedly shown to be robust (Hannan et al., 2005; Nebeker, Lambert, & Huefner, 1995; Vermeersch, Lambert, & Burlingame, 2000; Whipple et al., 2003).

Results

The IRI (Davis, 1980) evaluates the nature of empathy with prominence placed on two scaled emotional dynamics, PT and fantasy, and two scaled cognitive processes, EC and PD. The creator of the instrument, Davis (1980), has not recommended the use of a total composite score for this instrument. The IRI's four separate subscales measure each construct differently; thus having a total score would undermine the chief advantage of a multidimensional instrument. We begin our results analysis with a review of the reliability of the IRI, followed by a review of reliability of the OQ 45.2.

Instrument Reliability for This Study

IRI reliability results. Davis (1980) reported standardized alpha coefficients for the 7-item unit-weighted subscales: PT, .77; Fantasy, .77; EC, .71; and PD, .78. Leppma (2011) has reported an "overall Cronbach alpha coefficient" with an adequate score of .74. Other studies have attained comparable alpha coefficients on the 7-item subscales: PT, .64, .63, .56; Fantasy, .75, .68, .70; EC, .58, .64, .65; and PD, .69, .64, .64, respectively (Mestre, Frías, & Samper, 2004; Mestre, Pérez-Delgado, Frías, & Samper, 1999; Mestre, Samper, Tur, Cortés, & Nácher, 2006). Furthermore, Mestre et al. (2009) reported a composite alpha score of .71 in a longitudinal study. In this study, the reliability of the IRI instrument was investigated by implementing Cronbach's alpha scores on the four subscales of the IRI, yielding similar results (see Table 1).

OQ 45.2 reliability results. Reliability scores on the OQ 45.2 have demonstrated reasonable outcomes in numerous studies. The alpha coefficient was .93 in M. J. Lambert et al.'s (1996; creator of the OQ 45.2) original study. Those results were confirmed in a 2001 study with an alpha score of .91; of note, Lambert was again the principal investigator (M. J. Lambert et al., 2001). Similarly, Seong-Hyeon (2009) found the OQ 45.2 to have a Cronbach's alpha score of .93. LaFrance's (2013) work demonstrated a .92 internal reliability, and most recently, Gross et al. (2015) reported .82 and .92 alpha levels for Hebrew and Arabic populations participating in their research, respectively. In the current research, the reliability of the OQ 45.2, calculated by a Cronbach's alpha score, was .90.

Statistical Analysis

To test hypotheses about Group A and Group B at baseline (Time 1), at Posttest 1 (Time 2), and at Posttest 2 (Time 3), the researchers used two-way repeated-measures analysis of variance (ANOVA). Repeated-measures ANOVA should be used when all members of a random sample are measured under different conditions, as they are in this study. The measurement of the dependent variable is repeated; in this study, the participants were given a pretest at baseline, a test at 6 weeks, and a test again at 12 weeks. Therefore using a standard ANOVA in this case is not

appropriate because it does not model the correlation within the individual being assessed repeatedly; the data violate the ANOVA assumption of independence.

Hypothesis 1. The researcher used two measures to test this hypothesis: the PD (Tabachnick & Fidell, 2013) scale of the IRI and the composite score (CS) of the OQ 45.2. Both are designed to indicate levels of stress. Assumptions of equality of variance and covariance matrices were met; however, the assumption of sphericity was violated, and the Huynh–Feldt correction is reported. The result of the repeated-measures ANOVA indicated that there are significant differences in time with a within-subjects factor, $F(1.15, 78.3) = 176.6$ (Huynh–Feldt), $p < .001$, partial $\eta^2 = .72$. Examining post hoc tests indicated significant differences between Time 1 ($M = 22.4$, $SD = 1.9$), Time 2 ($M = 25.2$, $SD = 2.1$), and Time 3 ($M = 26.4$, $SD = 2.7$). The interaction of time and group was not found to be significant. There were no statistically significant differences between the treatment and control groups (the between-subjects factor), however. Examining Figure 1 indicates that the groups were very consistent on their self-reported levels of PD, with the control group showing slightly more distress, although this was not a significant difference.

A repeated-measures ANOVA was conducted using the OQ 45.2 CS to compare stress levels of Group A and Group B at baseline (Time 1), at Week 6 (mid-intervention for Group A, pretest for Group B; Time 2), and at Week 12 (posttest for both groups; Time 3). The assumption of sphericity was violated, and the Huynh–Feldt correction is reported. The result of the repeated-measures ANOVA

Table 1
Alpha Coefficients for IRI Subscales

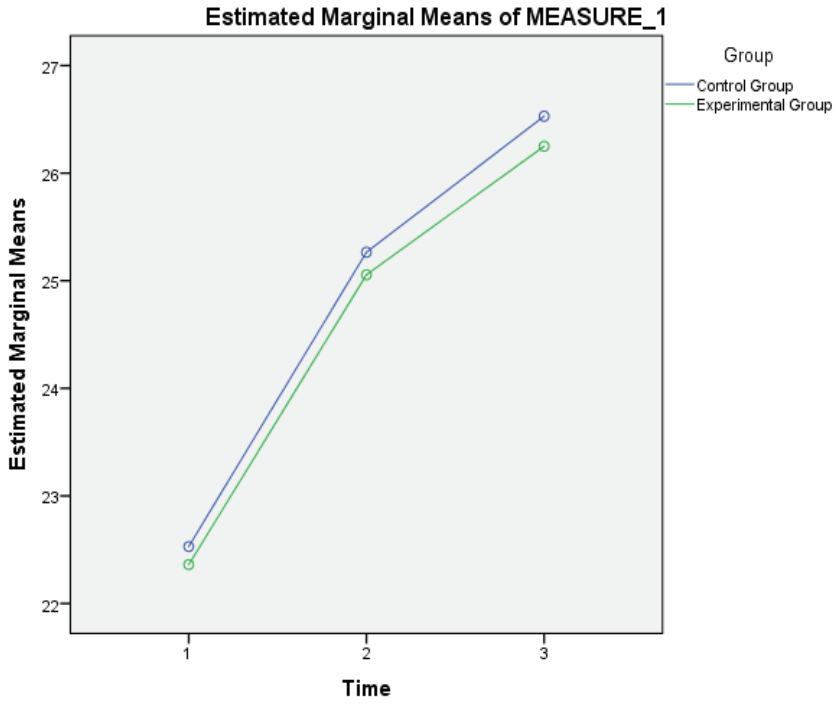
	Experimental group	*Control group*
Perspective Taking		
Time 1	.72	.71
Time 2	.74	.71
Time 3	.75	.74
Fantasy		
Time 1	.70	.72
Time 2	.71	.70
Time 3	.73	.74
Empathetic Concern		
Time 1	.68	.69
Time 2	.71	.70
Time 3	.74	.73
Personal Distress		
Time 1	.67	.68
Time 2	.69	.67
Time 3	.70	.69

Note. Time 1 = Week 0. Time 2 = Week 6. Time 3 = Week 12.

indicated that while the main effects of time are significant, so is the interaction of time and group, $F(1.5, 100.8) = 166.8$ (Huynh–Feldt), $p < .001$, partial $\eta^2 = .71$. This implies that the effects of the meditation were not the same for each group at each time period. Partial plots (see Figure 2) indicate that the groups were initially similar on the CS, with the control group showing slightly more distress at baseline (Week 0). Although the control group showed a higher level of stress at each time period, with the significant interaction of time and group, this difference depended on the time at which the participants were assessed, with the largest difference at Time 2 (Week 6; see Figure 2). The Time 2 measure constitutes mid-intervention for Group A and was still preintervention for Group B.

Hypothesis 2. A repeated-measures ANOVA was conducted on the IRI Fantasy subscale to compare the levels of empathy in imaginary situations between Group A and Group B at baseline (Time 1), at Week 6 (Time 2), and at Week 12 (Time 3). The assumption of sphericity was violated, and the Huynh–Feldt correction is reported. The result of the repeated-measures ANOVA indicated that although the

Figure 1
Profile plot of treatment versus control group on personal distress

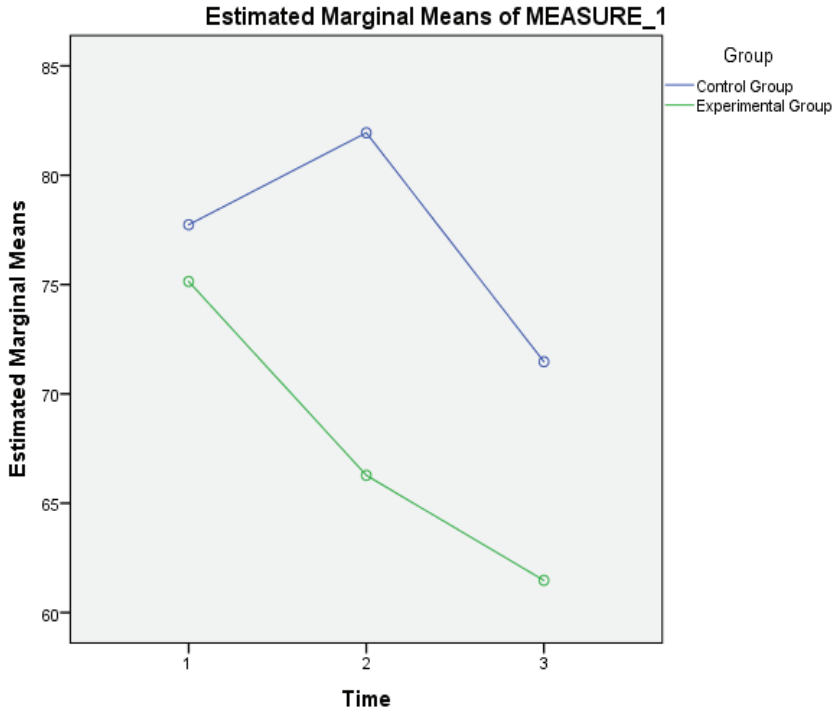


main effects of time are significant, so is the interaction of time and group, $F(1.6, 109.7) = 25.0$ (Huynh–Feldt), $p < .001$, partial $\eta^2 = .27$. This implies that the effects of the intervention are not the same for each group at each time period. Figure 3 indicates that while both groups started with low levels on the Fantasy subscale, with the significant interaction of time and group, this difference depended on the time at which the participants were assessed. Both groups ended the intervention with higher levels on the Fantasy subscale.

A repeated-measures ANOVA was conducted of the IRI PT subscale to compare the groups' levels of perspective taking in social situations at baseline (Time 1), at Week 6 (Time 2), and at Week 12 (Time 3). The assumption of sphericity was violated, and the Huynh–Feldt correction is reported. The result of the repeated-measures ANOVA indicated that while the main effects of time are significant, so is the interaction of time and group, $F(1.5, 98.6) = 21.7$ (Huynh–Feldt), $p < .001$, partial $\eta^2 = .24$. This implies that the effects of the intervention are not the same for each group at each time period. Figure 4 indicates that both groups started with similarly low levels of PT. With the significant interaction, these differences must

Figure 2

Profile plot of treatment versus control group on OQ 45.2 composite score

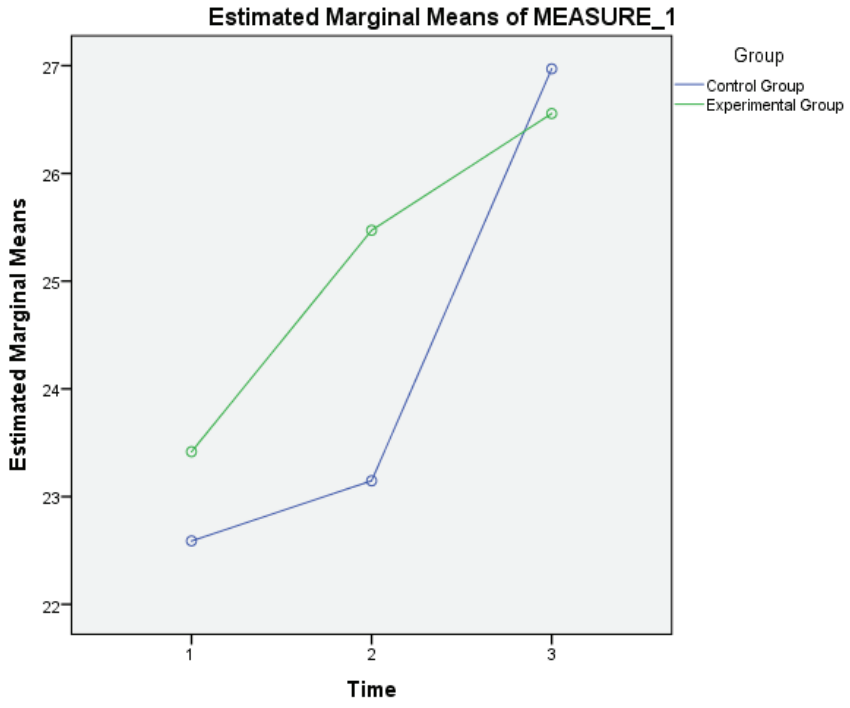


be viewed in relation to the time at which they were measured. Both groups ended the intervention with higher levels of PT, with the largest difference at Time 2.

A repeated-measures ANOVA was conducted with the IRI EC subscale to compare empathy levels of Group A and Group B at baseline (Time 1), at Week 6 (Time 2), and at Week 12 (Time 3). The assumption of sphericity was violated, and the Huynh–Feldt correction is reported. The result of the repeated-measures ANOVA indicated that while the main effects of time are significant, so is the interaction of time and group, $F(1.4, 96.1) = 22.7$ (Huynh–Feldt), $p < .001$, partial $\eta^2 = .25$. This implies that the effects of the meditation are not the same for each group at each time period. Figure 5 indicates that both groups started with similarly low levels of empathy, and again, with the significant interaction, this must be viewed in relation to the time at which they were assessed. Both groups ended the intervention with similarly high levels of empathy.

Hypothesis 3. To examine the direction and strength of the relationship between time spent doing LKM and reported levels of stress, a Pearson correlational

Figure 3
Profile plot of treatment versus control group on Fantasy subscale of the IRI.

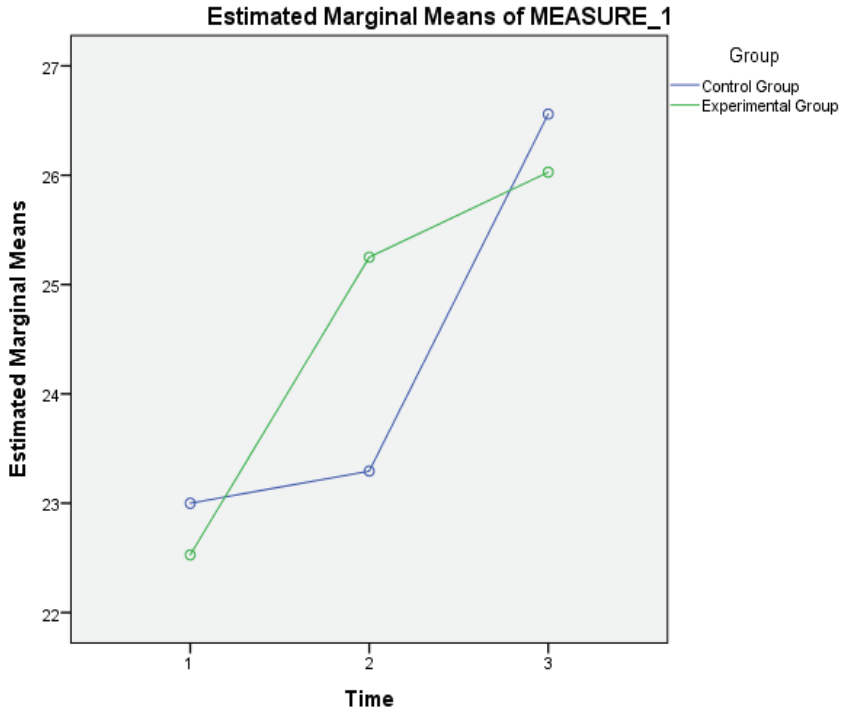


analysis was done on the participants' Posttest 2 score on the IRI PD scale and the OQ 45.2 CS. The results show that the PD scores are not significantly related to time spent doing LKM ($N = 70$, $r = -.084$), $p > .001$. However, time spent doing LKM and the CS of OQ 45.2 indicate a statistically significant, strong, and negative relationship ($N = 70$, $r = -.489$), $p < .01$. More time spent meditating is related to less stress, as reported on the OQ 45.2.

To examine the direction and strength of the relationship between time spent doing LKM and empathy, a Pearson correlation was analyzed for the Posttest 2 IRI Fantasy subscale with the results indicating a statistically significant positive but moderate relationship ($N = 70$, $r = .447$), $p < .001$(Cohen, 1989). More time reported meditating is related to more empathy in imaginary situations. To examine the direction and strength of the relationship between time spent doing LKM and the Posttest 2 IRI PT scale, correlation analysis indicated a statistically significant but very weak negative relationship ($N = 70$, $r = -.104$), $p < .001$. More time reported doing meditation is related to less PT. To examine the direction and strength of the

Figure 4

Profile plot of treatment versus control group on Perspective Taking subscale of the IRI

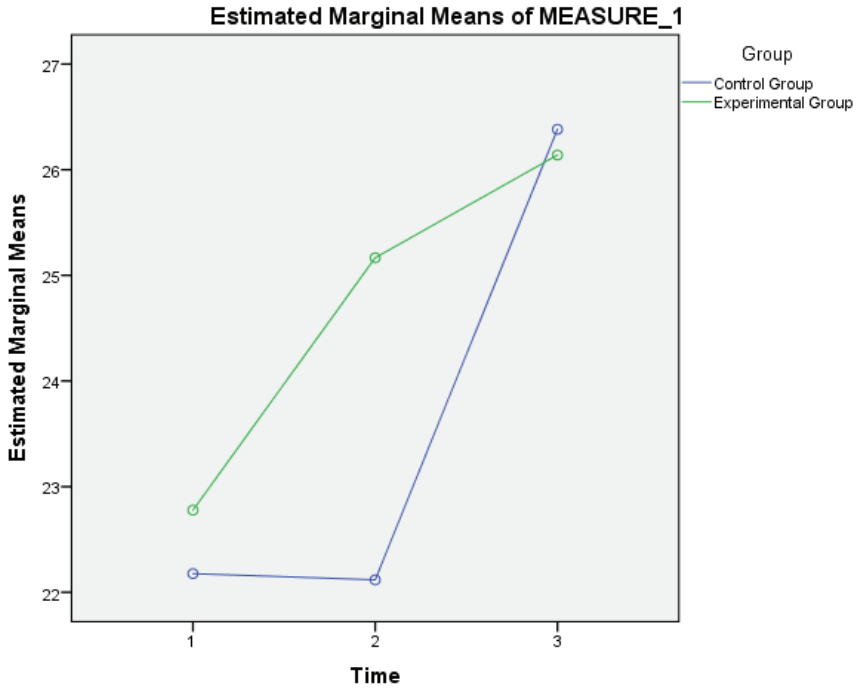


relationship between time spent doing LKM and participants' Posttest 2 EC, correlation analysis indicated a statistically significant positive, strong relationship ($N = 70$, $r = .551$), $p < .001$. More time reported doing meditation is related to more feelings of warmth and compassion for others.

Discussion

The results show statistically significant differences in levels of reported stress between student teachers who reported doing LKM (Group A) and those who did not do meditation (Group B) during the first 6 weeks of the study. Subjects who reported meditating also reported feeling less stress at Week 6 (mid-intervention), as measured by the OQ 45.2, than students who did not do meditation at Week 6. Students reported equivalent levels of stress before the intervention. Of note, those students who began meditating at Week 6 (Group B) reported decreased levels of stress at Week 12, indicating that for both groups, even those who started later and had less time meditating, LKM appeared to have a negative relationship to stress.

Figure 5
Profile plot of treatment versus control group on Empathetic Concern subscale of the IRI



This finding corroborates similar findings by other researchers that mindfulness practices may be effective for reducing teacher stress (i.e., Flook et al., 2013; E. Gold et al., 2010; Roeser et al., 2013); however, this study is additive to that body of work as it extends research to include preservice teachers. The students who meditated for 12 weeks (Group A) reported continued reduction in stress levels at Week 12. According to these findings, the meditation intervention served to lower stress after 6 weeks for both groups. The intervention appeared to increase effectiveness with time, as Group A's reported stress levels continued to decrease from Week 6 to Week 12. These findings are also consistent with those from previous studies (Abenavoli et al., 2013; Anderson et al., 1999; Fredrickson et al., 2008; Jennings et al., 2013; Weibel, 2007).

While the findings using the OQ 45.2 are robust, results from analysis of the IRI measures of stress show no statistically significant differences between groups. The OQ 45.2 is a clinical instrument with greater sensitivity to degrees of stress experienced by participants (social stress, work stress) measured with 45 items. Alternatively, there are seven particular questions in the IRI PD subscale. They focus on measuring the emotional responses of respondents particularly in times of distress. The PD subscale addresses the tendency to experience distress in stressful situations (e.g., "In emergency situations, I feel apprehensive and ill-at-ease"), whereas the OQ 45.2 assesses current stress symptoms, or state stress, experienced by the respondent within the past week.

This study also shows consistent and robust differences in reported levels of empathy between student teachers who reported doing LKM and those who did not. The groups reported equivalent levels of empathy at baseline (Week 1) and after 12 weeks at Posttest 2, but there were statistically significant differences between the two groups after the first 6 weeks, at Group A's mid-intervention. After meditating for 6 weeks, students in Group A reported feeling more empathy as measured by all 3 IRI subscales than students in Group B, who did not meditate during that time. Group A's reported levels of empathy rose steadily throughout the intervention. Similarly, after beginning LKM at Week 6, students in Group B reported increased levels of empathy at Week 12. According to these findings, the meditation intervention may help raise reported feelings of empathy. The intervention appears to increase in effectiveness over time, as reported empathy scores for Group A continued to increase from Week 6 to Week 12. These findings are consistent with the findings of Fredrickson et al. (2008) and Leppma (2011).

These findings are critical because the Fantasy subscale of the IRI measures one's ability to imagine other scenarios or situations (a necessary skill for perspective taking), and the PT subscale measures one's ability to put oneself in another person's situation. These skills are critical to sustaining empathy for others. The empathetic teacher will be able to think beyond a student's behavior in the classroom and empathize with difficulties the child may be experiencing at home or in his or her community. This empathy might compel such a teacher to compassion

and kindness for the student within the learning relationship, which translates to caring and mattering, necessary conditions for the educational context (Bloch, 2009; Elliott et al., 2004; Tucker et al., 2010).

A further finding from this study is that the amount of time students reported spending in meditation was positively related to reported empathy, as measured by the IRI subscales of EC and Fantasy (see Table 2). Participants who reported doing more LKM also reported experiencing greater levels of actual EC and deeper emotions in imaginary situations. A weak negative relationship showed that participants who spent less time with LKM scored lower on the PT subscale. These findings are different from Leppma's (2011), who found no statistically significant difference between the amount of time spent with LKM and the subscale scores of the IRI. This sample consisted of undergraduate student teachers, while Leppma's consisted of master's-level preservice counselors. In addition to possessing more maturity than undergraduate students, the participants in Leppma's study were likely to have been predisposed to the practice of empathy skill (as part of their counselor training), resulting in a statistically nonsignificant finding.

Moreover, the results of this study show a correlation between the reported amounts of time spent participating in LKM and levels of empathy and stress reported by participants. The actual time students reported in this study (mean week/hour/participant = .78) was relatively small when compared with other studies (e.g., Carson et al., 2005). Still, these findings show that the amount of time students report spending in meditation is negatively related to their reported levels of stress, as measured by the OQ 45.2. Consistent with the group comparison results, the correlation between stress and the IRI measure of PD was not significant. The findings for the OQ 45.2 are consistent with previous studies conducted with adult students, participants in community settings, and clinical populations that provide evidence that meditation can reduce negative mental health symptoms and that the time spent in meditation and quality of meditation impact its effectiveness (e.g., Baer, 2003;

Table 2
Time Spent Meditating, Levels of Personal Stress, Perspective Taking, and Empathetic Concern

	Time	*Personal Distress*	*OQ 45.2 CS*	*Fantasy*	*Perspective Taking*
Personal Distress	−.08	–	–	–	–
OQ 45.2 CS	−.49**	.30*	–	–	–
Fantasy	−.02	.71**	.21	–	–
Perspective Taking	−.10	.80**	.32**	.86**	–
Empathetic Concern	−.03	.81**	.28*	.89**	.90**

Note. CS = composite score.
*Significant at $p < .05$ level. **Significant at $p < .01$ level.

Beddoe & Murphy, 2004; Brown et al., 2007; Murphy Donovan, & Taylor, 1997). The results of this study are consistent with findings by Fredrickson et al. (2008) that showed the amount of time spent in meditation to be a significant predictor of positive emotions. Weibel (2007) also found a significant relationship between amount of time spent in LKM between sessions and improvement in outcome measures in his study of 71 undergraduate psychology students. Shapiro et al. (2007) suggested there may be a critical threshold of practice time necessary to significantly affect psychological variables. However, we contend that this threshold may vary, depending on the mental health of the individual at the time the practice began. Thereby the threshold may be much lower for someone who is already relatively healthy.

Limitations

As with all research, studies are subject to limitations, and results should be interpreted with caution. In this study, student teachers participated in nonmandatory MT and practice. However, the results, including data from the IRI, the OQ 45.2, and hour logs, were all provided by participant self-report. When self-reporting, it is possible for participants to give answers that they feel are socially desirable. More than 200 students were invited to participate, but only 73 participated in and 70 completed this study. It is possible that the students who opted into this study as participants were those who already had an inclination and openness toward this type of meditative practice; therefore results were more likely immanent with this sample and not necessarily representative of the population.

Future Research

There appears to be much promise for the positive impact of mindfulness-based practices on the reduction of teacher stress, anxiety, and depression and the concurrent improvement in self-compassion, empathy for others, and overall positive emotions (E. Gold et al., 2010; Roeser et al., 2013; Roeser et al., 2012). Future areas of research might include considering how mindfulness-based practices improve teacher effectiveness. Some researchers have begun to look at how MT for teachers changes the behavior of students. For example, Singh, Lancioni, Winton, Karazsia, and Singh (2013) found that preschool teachers attending an 8-week mindfulness course did have students with fewer negative social interactions, increased isolate play, and increases in teacher request compliance, which the researchers attributed to more positive interactions within teacher–student relationships. However, the study was conducted with three preschool teachers and thus its results are not generalizable. There is much more work to do in exploring the complex nature of mindfulness and the dynamics between teachers, students, and the learning environment. Further research may also be conducted to determine

the effects of teacher mindfulness on teacher career satisfaction, commitment, and retention (Bernay, 2014; McCarthy et al., 2014).

A further dynamic from this study that the authors would like to explore is the relationship between actual time (in minutes) spent meditating based on participant logs and participant outcomes. This could be done for both groups as a within-group analysis. The analysis might yield further information about how much meditation is necessary to reduce the negative effects of stress, at a statistically significant level, as measured by the OQ 45.2, and to increase positive emotion, at a statistically significant level, as measured by the IRI.

Conclusion

This study was designed to investigative applications of LKM as a coping technique for preservice student teachers. Preservice teachers are under enormous amounts of stress and many times are not equipped with proper stress management skills. In addition, scholars have contended that the cultivation of empathy and compassion can have a positive impact on the relationship between students and teachers (Bloch, 2009; Cooper, 2003; Crippen, 2010; Tucker et al., 2010; Whang & Nash, 2005). Furthermore, this relationship influences the effectiveness of teachers and may impact student outcomes. The results of this study show that LKM resulted in lower levels of reported stress and higher reported levels of empathy among the student teachers who participated in this study.

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