

## RESEARCH ARTICLE

# The Benefits of Meditation Vis-à-Vis Emotional Intelligence, Perceived Stress and Negative Mental Health

Li-Chuan Chu\*<sup>†</sup>

School of Health Policy and Management, Chung Shan Medical University, Taiwan, ROC

### Summary

This paper evaluates the benefits of meditation in regard to emotional intelligence (EI), perceived stress and negative mental health with cross-sectional and experimental studies. It first studied 351 full-time working adults with different amounts of experience in meditation for these factors in order to test the hypothesis that their differences in them were based on differences in meditation experience, and found that those participants with greater meditation experience exhibited higher EI, and less perceived stress and negative mental health than those who had less or none. It then randomly divided 20 graduate students with no previous experience of meditation into a mindfulness meditation group ( $n = 10$ ) and a control group ( $n = 10$ ), and measured them for the same variable pre-treatment and post-treatment to test the hypothesis that meditation training improves people's state, and found that those who completed the mindfulness meditation training demonstrated significant improvements compared to the control group. Copyright © 2009 John Wiley & Sons, Ltd.

### Keywords

meditation; emotional intelligence; perceived stress; negative mental health; mindfulness

### \*Correspondence

Li-Chuan Chu, School of Health Policy and Management, Chung Shan Medical University, 100, Sec. 2., Da-Qing St, Taichung, 402, Taiwan, ROC.

<sup>†</sup>Email: lichuan@csmu.edu.tw

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## Introduction

Many studies have linked perceived stress, and other negative mental and emotional states to adverse health outcomes (Burns, Drayson, Ring, & Carroll, 2003). Researchers have recently begun examining the impact of emotional intelligence (EI) on people's mental health or as a factor moderating stress, and have found that people with higher EI suffer less subjective stress and experience better health and well-being (Ciarrochi, Deane, & Anderson, 2002; Donaldson-Feilder & Bond, 2004; Goldman, Kraemer, & Salovey, 1996; Mayer & Salovey, 1995; Slaski & Cartwright, 2002; Tsousis & Nikolaou, 2005).

Discovering methods for enhancing EI, reducing perceived stress and promoting mental health simultaneously has become a salient area of research. Meditation would seem to be one of the most effective coping strategies. A substantial amount of research has found that meditation is not only beneficial to mental health (Baer *et al.*, 2008; Carmody & Baer, 2008; Shapiro, 1992) and the regulation of cognitive and emotional functioning (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Segal, Williams, & Teasdale, 2002; Teasdale, 1999; Teasdale *et al.*, 2000), but is also effective in eliminating perceived stress and related symptoms (Carmody & Baer, 2008; Chang *et al.*, 2004). Other studies have found that practicing meditation

can enhance EI, tolerance, sociability, empathy, positive states of mind, positive values, happiness and joy and positive thinking (Baer *et al.*, 2006; Beddoe & Murphy, 2004; Block-Lerner, Adair, Plumb, Rhatigan, & Orsillo, 2007; Chang *et al.*, 2004; Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987; Griggs, 1976; Hanley & Spates, 1978; Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008a; Shapiro, 1992; Shapiro, Schwartz, & Bonner, 1998), or have found that it can decrease anger, anxiety, hostility and depression, and relapses into depression significantly (Dua & Swinden, 1992; Hayes, 2004; Segal, Williams, Teasdale, & Kabat-Zinn, 2007; Segal *et al.*, 2002; Shapiro *et al.*, 1998; Teasdale, 1999; Teasdale *et al.*, 2000).

These benefits of meditation may be attributed to its nature. Lutz, Slagter, Dunne and Davidson (2008b) found that meditation practices' potential regulatory functions on attention and emotional processes can cultivate such ends as well-being and emotional balance. Shapiro (1982) categorized meditation's attention strategies as being: (a) concentrative meditation; (b) mindfulness meditation; and (c) integrated meditation, which involves shifting back and forth between the first two.

Concentrative meditation fixes the mind on a specific object, such as the sensation of breathing. When people who are meditating notice that their attention has wandered away from the chosen object, they tell themselves that it is all right to be distracted, disengage their attention from the distracters and then return their attention to the chosen object. Novice meditators contend with more distractions, while advanced meditation practitioners have an especially acute ability to notice when their minds have wandered. They also invoke their regulative skills increasingly less frequently, and their ability to sustain focus therefore becomes progressively more effortless (Lutz *et al.*, 2008b). Such a path of concentration can lead to states of happiness and peace (Engler, 1984), a sense of physical lightness or vigour and a decrease in the need for sleep and emotional reactivity (Lutz *et al.*, 2008b) by decreasing interest in other thoughts and creating non-engagement with mental activity (i.e. meta-cognitive awareness).

Mindfulness meditation, however, does not focus on objects; non-reactive metacognitive monitoring; or non-reactive awareness of automatic cognitive and emotional interpretations of sensory, perceptual and endogenous stimuli (Lutz *et al.*, 2008b). People engaged in mindfulness meditation try to cultivate a new rela-

tionship with internal experiences by regulating such things as attention, awareness of present experiences, emotions and thoughts through non-judgmental acceptance of those emotions and thoughts without avoiding them or overengaging with them (Baer *et al.*, 2006; Bishop *et al.*, 2004; Kabat-Zinn, 1990; Kumar, 2005).

Mindfulness and EI, as defined by Salovey and Mayer (1990), are similar in that both are meta-cognitive and meta-mood constructs, that is, they both emphasize people's abilities to perceive, understand and regulate their thoughts and emotions (Donaldson-Feilder & Bond, 2004). Some studies supported the potential importance of mindfulness to EI more generally. Specifically, Ciarrochi, Blackledge, Bilich and Bayliss (2007) indicated that mindfulness-based EI training could improve EI. Kabat-Zinn (1993) and Welwood (1996) argued that mindfulness promotes attunement, connection and closeness in relationships. Baer, Smith and Allen (2004); Baer *et al.* (2006); and Brown and Ryan (2003) showed that the components of EI, which are social skills and perspective taking, interpersonal closeness, cooperative response patterns and marital partner satisfaction (Schutte, Malouff, & Bobik, 2001), are significantly related to mindfulness. Davidson and Harrington (2002) also suggested that the greater insight into self, others and human nature, along with an easing of ego-based concerns that is afforded by mindfulness, encourages a more compassionate concern for others. Consistent with the proposition, Beitel, Ferrer and Cecero's (2005) initial correlational evidence supported this notion (see Brown, Ryan, & Creswell, 2007, for review).

In addition, individuals can develop self-awareness, which is one of the major tenets of EI, by practicing mindfulness meditation. This means that they could be mindful about their environment and whatever is happening in the here and now, rather than focusing too much on the past and the future (Epstein, 1990).

This practice can destroy notions of a permanent, intact self, and is accompanied by the development of a mindfulness through the experience of meditation would become an increasingly effortless surrender to the flow of experience without any emotional disturbance (Epstein, 1990; Lutz *et al.*, 2008b). Ryan and Deci (2000) found that this mindfulness can capture a quality of consciousness from the clarity and vividness of current experience and functioning, and might effectively disengage individuals from automatic thoughts,

habits and unhealthy behavioural patterns, thus fostering informed and self-endorsed behavioural regulation, something which has long been associated with the enhancement of well-being.

According to self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), which posits that compared with automatic processing, controlled processing often precludes the consideration of options that would be more congruent with needs and values (Ryan, Kuhl, & Deci, 1997). Open awareness may effectively facilitate the choosing of behaviour that is consistent with one's needs, values and interests (Deci & Ryan, 1980). Mindfulness can therefore facilitate well-being through self-regulated activity and the fulfillment of the basic psychological need for autonomy, defined as self-endorsed or freely chosen activity (Brown & Ryan, 2003; Hodgins & Knee, 2002).

From the perspective of emotional regulation, substantial evidence exists that both the avoidance of emotions and overengagement with them are associated with poor physical and psychological health outcomes (Beevers, Wenzlaff, Hayes, & Scott, 1999; Gross, 2002; Nolen-Hoeksema, 2000; Ottenbreit & Dobson, 2004; Wenzlaff & Luxton, 2003). Thought suppression and avoidant coping attempt to regulate negative thoughts and emotions, but these strategies often exacerbate problems and contribute to depression (Beevers *et al.*, 1999; Ottenbreit & Dobson, 2004; Wenzlaff & Luxton, 2003).

Baer *et al.* (2006) found that most of the five principal facets of mindfulness, which are observing, describing, acting with awareness, not judging inner experiences and not reacting to inner experiences, are significantly related to meditation experience and well-being, unlike experiential avoidance and thought suppression. Mindfulness meditation can therefore prevent depression relapse by interrupting destructive cycles of avoidance and overengagement (Segal *et al.*, 2002; Teasdale, 1999; Teasdale *et al.*, 2000), and has therefore become a useful clinical intervention, non-clinical intervention or both for improving psychological and physical functioning by promoting emotional regulation (Arch & Craske, 2006; Brown & Ryan, 2003; Hayes & Feldman, 2004; Kumar, Feldman, & Hayes, 2008; Ramel, Goldin, Carmona, & McQuaid, 2004).

In light of the preceding review of the literature, meditation not only has a direct effect in terms of generating a relaxation response to balance the state of its practitioners' psychological health, but it also has an

indirect effect through the enhancement of their psychological well-being by storing up high EI and maintaining a positive attitude towards perceived stress.

Lutz *et al.* (2008b) suggested that an important area for future research into meditation practices is their observed ability to invoke an emotional state of empathy, affection and compassion for others. In line with this suggestion, this study's objective was to discover the benefits of meditation for EI, perceived stress and mental health through cross-sectional and experimental studies. To this end, we first examined the relationship between meditation experience and these dependent variables by employing a cross-sectional study. We then appraised the improvement effects in terms of these dependent variables after training in mindfulness meditation by conducting an experimental study.

## Study 1: a cross-sectional study

### Aims and hypotheses

According to the review of the literature, we hypothesized that meditation experience is positively associated with EI, and negatively associated with perceived stress and negative mental health. The participants who had greater meditation experience exhibited higher EI and less perceived stress, and negative mental health than those who had less or none.

### Method

#### Participants and procedure

We used a cross-sectional survey research design and convenience sampling to collect data. The study's participants were full-time working adults employed by public and private enterprises in Taiwan. We distributed 500 questionnaires, directing 250 mostly towards students of the Puzhong Meditation Center of the Chung Tai Chan Monastery who had jobs. The sample returned 351 responses, 156 from men and 195 from women, with a mean age of 36.83 years [standard deviation (SD) 8.28], an effective questionnaire rate of 70 per cent. In terms of position ranks, the majority of participants were from non-manager (60 per cent), and the rest were from manager (40 per cent) in organizations.

In addition, the participants had a wide range of meditation experience. Thirty-eight (10.8 per cent) had more than 5 years of experience meditating with the

Chung Tai Chan Monastery, 22 (6.3 per cent) had 3–5 years, 41 (11.7 per cent) had 1–3 years, 44 (12.5 per cent) had less than 1 year and 206 (58.7 per cent) had no meditation experience. The participants completed a battery of structured questionnaires that included items measuring meditation experience, EI (Schutte *et al.*, 1998), perceived stress (Cohen, Kamarck, & Mermelstein, 1983) and negative mental health (Goldberg & Hillier, 1979). They were employed in such industry sectors as high-tech, finance and insurance, business and professional services, traditional manufacturing and government (i.e. civil servants and teachers).

## Measures

### Meditation experience

We defined meditation experience as having at least 20 min regular daily practice of either concentrative, mindfulness or integrated meditation. It was an open-ended single item asking how many years the respondent had been meditating before receiving the questionnaire.

### EI

We assessed EI by using the emotional intelligence scale (EIS) (Schutte *et al.*, 1998). This 33-item self-report scale, based on the original model by Salovey and Mayer (1990), has been widely used to assess a variety of characteristics of EI, including the appraisal and expression, regulation and utilization of emotion. Schutte *et al.* (1998) found the scale to have high reliability, with a Cronbach's alpha coefficient of 0.9 for the 33-item scale, and high validity. Petrides and Furnham (2000a) identified four interpretable factors in the Schutte *et al.* measure, which were optimism and mood regulation, appraisal of emotions, social skills and the utilization of emotions. We measured each item on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The higher scores were indicative of higher EI.

### Perceived stress

We assessed this using the perceived stress scale (PSS) (Cohen *et al.*, 1983). This 14-item self-report scale was designed to measure the degree to which people appraise situations in their lives as stressful. Specifically, Cohen *et al.* (1983) designed PSS items to provide a direct measure of the degree to which respon-

dents currently found their lives unpredictable, uncontrollable and overloaded. The PSS measure, which asks subjects to rate how often they have felt or thought a certain way during the preceding month, is measured using a five-point Likert scale ranging from 0 (never) to 4 (very often). Higher scores indicate higher levels of stress. This measure showed adequate reliability, with Cronbach's alpha coefficients of 0.84, 0.85 and 0.86 for two college student samples and one community smoking-cessation programme sample, and, as predicted, has been correlated with life event scores, depressive and physical symptomatology validity, the utilization of health services, social anxiety and smoking-reduction maintenance (Cohen *et al.*, 1983).

### Negative mental health

We assessed negative mental health by using the general health questionnaire-28 (GHQ-28) scale (Goldberg & Hillier, 1979). This 28-item self-report scale asks respondents about such recently experienced symptoms or behaviours as somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Each subscale contains seven items rated on a four-point Likert scale, with binary scoring (0–0–1–1) ranging from 0 (not at all) to 1 (much more than usual). The GHQ-28 is a commonly used instrument with plenty of evidence of reliability and validity. The higher scores indicate poorer mental health (Goldberg & Hillier, 1979).

### Control variables

Such demographic variables as gender, age, position and industry, however, influence EI (Atkins & Stough, 2005; Goleman, 1995; Mayer, Salovey, & Caruso, 2002; Palmer, Gardner, & Stough, 2003; Petrides & Furnham, 2000b; Schutte *et al.*, 1998; Shih & Susanto, 2007; Slaski & Cartwright, 2002; Van Rooy, Alonso, & Viswesvaran, 2005), perceived stress and mental health (Arber & Cooper, 1999; Baum & Grunberg, 1991; Chang & Lu, 2009; Farrer, Leach, Griffiths, Christensen, & Jorm, 2008; Liu, Spector, & Shi, 2008; Matthews, Manory, & Power, 1999). We controlled for these demographic variables before evaluating the predictive validity of meditation experience on the outcomes of interest.

Some of these control variables are set dummy variables for gender (1 = female, 0 = male), position (1 = manager, 0 = non-manager) and industry. We created

four dummy variables to represent five types of industry, industry D1 being the high-tech industry with code = 1, otherwise code = 0; industry D2 being the finance and insurance industry with code = 1, otherwise code = 0; industry D3 being the business and professional services industry with code = 1, otherwise code = 0; and industry D4 being the traditional manufacturing industry with code = 1, otherwise code = 0.

## Results

The results indicate that all of the measures had high internal consistency, such as Cronbach's alpha scores of 0.87 for the EIS, 0.85 for the PSS and 0.89 for the GHQ-28. To test the hypothesis that meditation experience is positively associated with EI and negatively associated with perceived stress and negative mental health, we adopt hierarchical regression for examination. We first input employee's gender, age, position and industry as control variables. Then, meditation experience was input to test its impact on the outcomes of interest. Table I shows the results of the hierarchical regression analyses. Models 1.1, 2.1 and 3.1 show that the control variables accounted for significant portion of the variance in EI (6 per cent), perceived stress (7 per cent) and negative mental health (6 per cent). Age was significantly positively associated with EI ( $\beta = 0.12, p < 0.05$ ), and negatively associated with perceived stress

( $\beta = -0.20, p < 0.01$ ) and negative mental health ( $\beta = -0.16, p < 0.01$ ), whereas position was significantly positively associated with EI ( $\beta = 0.13, p < 0.05$ ). As expected, older employees had higher EI, and less perceived stress and negative mental health than younger ones, whereas managers had higher EI than non-managers. In addition, industry D2 was positively associated with negative mental health ( $\beta = 0.15, p < 0.05$ ), whereas industry D4 was negatively associated with EI ( $\beta = -0.14, p < 0.05$ ). The finance and insurance industry had more negative mental health than the government (i.e. civil servants and teachers), whereas the traditional manufacturing industry had less EI than the government (i.e. civil servants and teachers).

Models 1.2, 2.2 and 3.2 indicate that meditation experience accounted for an additional 2 per cent ( $p < 0.01$ ) of the variance in EI, an additional 3 per cent ( $p < 0.01$ ) of the variance in perceived stress and an additional 2 per cent ( $p < 0.05$ ) of the variance in negative mental health. Besides, meditation experience was significantly positively associated with EI ( $\beta = 0.17, p < 0.01$ ), and negatively associated with perceived stress ( $\beta = -0.20, p < 0.01$ ) and negative mental health ( $\beta = -0.14, p < 0.05$ ). In other words, the participants who had greater meditation experience exhibited higher EI, and less perceived stress and negative mental health than those who had less or none. These findings provide support for our hypotheses.

**Table I.** Results of hierarchical regression analyses on emotional intelligence (EI), perceived stress and negative mental health<sup>†</sup>

Predictor	EI		Perceived stress		Negative mental health	
	Model 1.1	Model 1.2	Model 2.1	Model 2.2	Model 3.1	Model 3.2
Gender	0.04 (0.66)	0.02 (0.42)	0.04 (0.81)	0.06 (1.10)	0.10 (1.85)	0.11 (2.05)*
Age	0.12 (1.97)*	0.06 (0.87)	-0.20 (-3.29)**	-0.13 (-1.99)*	-0.16 (-2.67)**	-0.11 (-1.72)
Position	0.13 (2.17)*	0.16 (2.71)**	-0.07 (-1.16)	-0.11 (-1.80)	-0.01 (-0.10)	-0.03 (-0.54)
Industry D1	-0.08 (-1.03)	-0.06 (-0.89)	0.01 (0.10)	-0.01 (-0.07)	0.07 (0.97)	0.06 (0.86)
Industry D2	-0.11 (-1.67)	-0.09 (-1.38)	0.10 (1.58)	0.08 (1.24)	0.15 (2.31)*	0.14 (2.06)*
Industry D3	-0.05 (-0.73)	-0.04 (-0.67)	0.02 (0.31)	0.01 (0.23)	0.07 (1.15)	0.07 (1.10)
Industry D4	-0.14 (-2.20)*	-0.16 (-2.51)**	0.10 (1.61)	0.12 (1.97)*	0.09 (1.48)	0.11 (1.72)
Meditation experience		0.17 (3.01)**		-0.20 (-3.45)**		-0.14 (-2.41)*
R <sup>2</sup>	0.06	0.08	0.07	0.10	0.06	0.08
Adjusted R <sup>2</sup>	0.04	0.06	0.05	0.08	0.04	0.05
R <sup>2</sup> change	0.06**	0.02**	0.07**	0.03**	0.06**	0.02*
F	2.89**	3.72**	3.61**	4.75**	3.13**	3.50**

Gender was coded as 1, female and 0, male; position was coded as 1, manager and 0, non-manager; industry D1 was coded as 1, high-tech and 0, otherwise; industry D2 was coded as 1, finance and insurance and 0, otherwise; industry D3 was coded as 1, business and professional services and 0, otherwise; industry D4 was coded as 1, traditional manufacturing and 0, otherwise; \* $p < 0.05$ ; \*\* $p < 0.01$ .

<sup>†</sup> Standardized coefficients are exhibited.

In addition, gender was significantly positively associated with negative mental health ( $\beta = 0.11, p < 0.05$ ), whereas industry D4 was significantly positively associated with perceived stress ( $\beta = 0.12, p < 0.05$ ) after controlling for the main effect of the meditation experience. As expected, female employees had more negative mental health than male ones, whereas the traditional manufacturing industry had higher perceived stress than the government (i.e. civil servants and teachers).

## Study 2: an experimental study

### Aims and hypotheses

This study used an experimental study design to appraise improvement in terms of the three main dependent variables of EI, perceived stress and negative mental health after mindfulness meditation training. We hypothesized that participants who accepted 8 weeks of mindfulness meditation training would show significant improvement in terms of these variables compared with a control group who did not receive any intervention.

### Method

#### Participants and procedure

##### Participants

We first posted the meditation experiment information on the bulletin board system of the National Central University (NCU) in Taiwan. Twenty graduate students from the NCU with no previous experience of meditation practice volunteered to participate. They were students in management, economics, philosophy, physics, mathematics and electrical engineering. We assigned them randomly to either a mindfulness meditation group ( $n = 10$ ) or a control group ( $n = 10$ ). One person in the control group dropped out during the experiment. We therefore used data covering 19 subjects (10 males and 9 females) in the analysis. The participants' mean age was 24.42 years. At the baseline, a chi-square test revealed no significant differences between the meditation and control groups in terms of such demographic variables as gender and department. In addition, independent sample *t*-tests also indicated no significant differences between the meditation and control groups in relation to such demographic variables as age. Not one of the subjects who joined this study was ill at that time.

### Procedure

We conducted the meditation programme over an 8-week period. The participants were compensated NT\$800 cash for their participation. The meditation participants had to take part in this programme once a week and continue with it for the full 8 weeks. Each experimental participant engaged in an eight-session meditation programme, with each session lasting 20 min. One week before the training began, we instructed the participants in the meditation group how to perform the mindfulness meditative practices that we taught, which did not include the full package of Kabat-Zinn's mindfulness-based stress reduction (1982, 1990) programme or Segal *et al.*'s mindfulness-based cognitive therapy (2002) relapse-prevention programme. For example, we did not include exercises related to yoga and the body scan.

In brief, we instructed participants to sit upright and comfortably, close their eyes, breathe through their noses and attend to their breathing as a target of focused conscious experience. After approximately 2 min, we told the participants to count their breaths silently as a means of further entraining their attention towards the process of their breathing. The counting phase lasted 5 min. We then led the participants in a 15-min silent meditation in which we instructed them to attend towards their breathing without counting for the duration of the meditation. We also instructed them that if they were aware that their attention had wandered from their breathing, they should attempt to disengage their attention from distracters and return their attention to their breathing in a non-judgmental manner.

The control group subjects did not receive any relaxation training and were only told at the first session to sit down and simply relax their mood and body during periods of inactivity.

### Materials

We tested all participants in a psychology laboratory over an 8-week period. They answered questions concerned with such demographic characteristics as gender, age and department. In addition, they also completed a battery of self-report questionnaires which included the EIS (Schutte *et al.*, 1998), the PSS (Cohen *et al.*, 1983) and the GHQ-28 inventory (Goldberg & Hillier, 1979; GHQ-28) both before and after the experiment. These questionnaires were described in study 1.

## Results

Table II presents a summary of the means and SDs for the different groups in relation to the measures for three main dependent variables. Independent *t*-tests showed no significant differences between the meditation and control groups for the three main dependent variables, but did for the utilization of emotions variable [ $t(17) = 2.65, p < 0.05$ ] in the pre-test measure. The meditation group had higher scores in regard to the utilization of emotions than the control group in the pre-test measure. However, the results of the independent sample's *t*-tests indicated that significant differences existed in the main dependent variables between the meditation and control groups in the post-test measures.

Compared with the finding of no significant differences in the pre-test, the meditation group exhibited higher scores in relation to such aspects of EI as optimism/mood regulation [ $t(17) = 3.84, p < 0.01$ ], the appraisal of emotions [ $t(17) = 3.44, p < 0.01$ ] and social skills [ $t(17) = 3.74, p < 0.01$ ] than the control group in the post-test measures. Moreover, the meditation group also had lower scores in regard to perceived stress [ $t(17) = -4.86, p < 0.001$ ], such aspects of negative mental health as somatic symptoms [ $t(17) = -3.14, p < 0.01$ ], anxiety and insomnia [ $t(17) = -4.70, p < 0.001$ ], social dysfunction [ $t(17) = -3.07, p < 0.01$ ] and severe depression [ $t(17) = -3.19, p < 0.01$ ] than the control group in the post-test measures. As predicted, the findings indicate that a statistically significant

improvement existed in the subjective evaluation of the three main dependent variables of the meditation group after the 8 weeks of mindfulness meditation training.

## Discussion

This study has examined the nature of meditation to determine whether it helps to improve EI, perceived stress and mental health, its three main dependent variables. Firstly, its cross-sectional study found that meditation experience was significantly associated with these variables. As expected, meditation experience was positively associated with EI, which is in line with other studies' findings that practicing meditation can enhance EI (Baer *et al.*, 2006), sociability (Hanley & Spates, 1978), empathy (Beddoe & Murphy, 2004; Block-Lerner *et al.*, 2007; Griggs, 1976; Lutz *et al.*, 2008a; Shapiro *et al.*, 1998), positive states of mind (Chang *et al.*, 2004), positive values (Gelderloos *et al.*, 1987), happiness, joy and positive thinking (Shapiro, 1992).

In addition, this study also found that meditation experience was negatively associated with perceived stress and negative mental health, which is in line with other studies which have also found that meditation can significantly decrease perceived stress (Carmody & Baer, 2008; Chang *et al.*, 2004), anger (Dua & Swinden, 1992), anxiety (Hahn & Whalen, 1974; Shapiro *et al.*, 1998), hostility and depression (Hahn & Whalen, 1974), and relapses into depression (Hayes, 2004; Segal *et al.*, 2002, 2007; Teasdale, 1999; Teasdale *et al.*, 2000).

**Table II.** Means and standard deviations (SDs) for the meditation and control groups regarding emotional intelligence (EI), perceived stress and negative mental health before and after training

	Meditation group (N = 10)		Control group (N = 9)	
	Pre-test Mean (SD)	Post-test Mean (SD)	Pre-test Mean (SD)	Post-test Mean (SD)
<b>EI</b>				
Optimism/mood regulation	3.62 (0.83)	4.11 (0.73)**	2.95 (0.88)	2.83 (0.73)
Appraisal of emotions	3.82 (0.70)	4.19 (0.64)**	3.49 (0.62)	3.16 (0.66)
Social skills	3.72 (0.60)	4.09 (0.38)**	3.37 (0.65)	3.07 (0.77)
Utilization of emotions	4.33 (0.67)*	4.35 (0.61)**	3.39 (0.87)	3.17 (0.76)
Perceived stress	2.04 (0.93)	1.31 (0.69)***	2.36 (0.95)	2.75 (0.59)
<b>Negative mental health</b>				
Somatic symptoms	1.33 (0.91)	0.40 (0.29)**	1.38 (0.85)	1.29 (0.84)
Anxiety and insomnia	1.04 (0.90)	0.33 (0.34)***	1.51 (0.92)	1.63 (0.80)
Social dysfunction	1.17 (0.58)	0.80 (0.44)**	1.10 (0.46)	1.35 (0.32)
Severe depression	0.63 (0.71)	0.14 (0.18)**	0.70 (0.56)	0.81 (0.63)

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

These benefits of meditation experience may be attributed to meditation practices' regulatory functions on attention and emotional processes (Lutz *et al.*, 2008b). The development of concentration or mindfulness through the experience of meditation would become increasingly effortless in sustaining focus or surrendering to the flow of experience without emotional disturbance (Epstein, 1990; Lutz *et al.*, 2008b).

In order to measure the positive effects of meditation accurately in relation to the three main dependent variables, we took the study a step further and examined the improvement effects of mindfulness meditation training in relation to these variables with an experimental study. As predicted, the results indicated significant improvement in the meditation group's subjective evaluation of the variables after an 8-week period of training in mindfulness meditation techniques. Compared with no significant differences between the meditation group and a control group in the pre-test, the meditation group exhibited higher scores in relation to such aspects of EI as optimism/mood regulation, the appraisal of emotions and social skills in the post-test measures than did the control group. Moreover, the meditation group also exhibited lower scores in relation to perceived stress and such symptoms of negative mental health as somatic symptoms, anxiety and insomnia, social dysfunction and severe depression in the post-test measures than the control group. Overall, these findings supported this study's hypotheses.

This study's major contribution is that EI, perceived stress and negative mental health can all be improved simultaneously through the practice of meditation. It also found that extended meditation practice sessions appear to lead to higher EI, and less perceived stress and negative mental health. Therefore, the findings confirm that meditation not only generates a direct effect for balancing its practitioners' psychological state of health, but also has an indirect effect in terms of enhancing their psychological well-being by storing up high EI and maintaining a positive attitude towards perceived stress.

## Limitations and future directions

In spite of these encouraging results, this study does have a number of limitations.

Firstly, the experimental results do not make clear the long-term changes in the three main dependent variables, which were assessed only at pre-treatment

and at post-treatment 8 weeks later. Such results did not show whether the positive effects of higher EI, and less perceived stress and negative mental health could be maintained for a longer period after meditation training. This is in line with the suggestion from Lutz *et al.* (2008b) that future studies could be extended to examine whether meditation training affects behaviour outside of the laboratory, and transforms such basic mental functions as emotions and attention in everyday life.

Next, this study did not examine whether mindfulness is associated with its three main dependent variables, but focused instead on the benefits of meditation in relation to them. Based on mindfulness theory and related experimental studies, we hypothesized that the participants who had long meditation experience would exhibit higher EI, and less perceived stress and negative mental health than those who had little or no meditation experience. It is important that the discussion about mindfulness and its potential relationship to EI, perceived stress and negative mental health be extended in the future.

Thirdly, sole reliance on the use of self-reporting as a measure of psychological outcomes makes it difficult to avoid the problem of common method bias in cross-sectional studies. Although the problem of common method bias could be balanced by the results of experimental studies, it could also be solved by multi-raters or by rating multi-periods in the future.

Fourthly, although we instructed the members of the control group to attempt to relax their moods and bodies, this was unlikely to make much improvement on their states in regard to the three main dependent variables, because this resting state was a non-meditative state without specific cognitive content and with a lack of awareness or clarity of mind. If just sitting and resting allow a person to think more non-constructively, muddled thinking may still be the result of greater emotional, cognitive, physical or psychological tension.

Finally, the generalization of the experimental study's findings is limited because of the small sample size.

In addition, Slaski and Cartwright (2003) found that managers who participated in a developmental EI training programme did register significant increases in EI, morale and quality of working life, and significant reductions in psychological symptoms, distress and subjective stress. Therefore, future studies should compare and evaluate the relative effectiveness of a



variety of such stress interventions as training courses in meditation and stress prevention on EI, perceived stress and negative mental health.

Next, there are many styles of meditation that widely differ from one another in their procedures, contents, objects, beliefs and goals. Given these differences, it is important that the analysis of whether any styles of meditation was more predictive of EI be extended in the future.

Our final recommendation is that complementary evidence be obtained by adding such psycho-physiological measurements that could respond immediately and precisely to individuals' emotional states and stress levels as electroencephalographs, electrocardiograms, heart rate, electromyographs, skin conductance, skin temperature, blood volume and respiration to the self-report measures that we used.

## Practical implications

Stress is a serious and an inevitable reality in a rapidly globalizing world of international business and competitive organizations. Employee stress and emotional well-being have been identified as important determinants of organizational health, performance and productivity. For example, Burton, Conti, Chen, Schultz, & Edington (1999) found high levels of emotional distress to be among the most costly health problems employers face in terms of absenteeism, disability and failure to meet productivity standards. The effective prevention and management of stress are therefore an important issue for organizations.

As previous researchers have suggested, people who have higher EI have more coping resources that reflect their ability to respond directly to challenges rather than to feel threatened when confronted by stressful events. These emotional resources are able to protect people from the pathogenic effects of stressful events by altering stressor appraisal. People exhibit better mental health when they have less perceived stress (Burns *et al.*, 2003), so organizations could use EI measures as an effective tool in employee selection in order to reduce stress-related costs.

Next, because prevention is indeed better than cure, the development of EI has great significance for work forces. As previous researchers have suggested, meditation may be an activity that promotes better health by reducing people's perception of stress and enhancing their EI. Most importantly, meditation practice costs

little and is easily administered. The practice of meditation is therefore one of the most cost-effective coping strategies for organizations.

## Conclusion

This study showed that meditation is not only beneficial to the state of its practitioners' psychological health, but is also effective in enhancing their psychological well-being by storing up high EI and maintaining a positive attitude towards perceived stress. In addition, greater improvements in EI, perceived stress and negative mental health associated with longer durations of meditation practice. We suggest that meditation practice could be incorporated in one's daily routine career or family.

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