Psychology Research and Behavior Management

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ORIGINAL RESEARCH

Calligraphy and meditation for stress reduction: an experimental comparison

This article was published in the following Dove Press journal:
Psychology Research and Behavior Management
13 February 2014
Number of times this article has been viewed

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Background: Chinese calligraphic handwriting (CCH) has demonstrated a new role in health and therapy. Meanwhile, meditation is an traditional and effective method for coping with stress and staying healthy. This study compared the effectiveness of CCH and meditation as distinctive and parallel stress reduction interventions.

Methods: Thirty graduate students and academic staff members in Taiwan who suffered from stress were selected by the General Health Questionnaire and randomly assigned to one of three treatment groups, ie, a CCH group, a meditation group, or a control group, for 8 consecutive weeks. Changes in physiological parameters were measured before, during, and after treatment.

Results: CCH and meditation showed their strength in the respective indices of stress. There was a significant difference in respiratory rate, heart rate, and electromyographic scores between the groups. Comparing pre- and post-effects, a decrease in heart rate and an increase in skin temperature was seen in subjects who practiced CCH. Increased skin temperature and decreased respiratory rate were also seen in subjects who practiced meditation, along with reduced muscle tension and heart rate.

Conclusion: CCH and meditation have good effects in stress reduction. CCH is a particularly promising new approach to reducing stress.

Keywords: calligraphic handwriting, meditation, stress reduction, intervention

Introduction

Chinese calligraphic handwriting (CCH) involves use of a soft-tipped brush to write special Chinese characters and is widely regarded as a unique art form. In the past, research on CCH has focused mainly on how to execute and appreciate it artistically by following the experiences of the great masters. During the last three decades, Kao et al have conducted systematic research on the bodily and mental processes involved in brush handwriting from a psychological perspective according to the psychogeometric theory of Chinese character writing.[1,2] Recently, some of this research has established CCH as having positive effects on cognitive enhancement in children with attention deficit hyperactivity disorder[3] and cognitive recovery in patients with Alzheimer's disease.[4–8] There is also some clinical evidence that CCH can help with behavioral change and emotional stability in patients with depression[1] or cancer.[8,9] In light of these findings, we suggest that practicing CCH has a further role in improving the practitioner's psychological and physical health through training, therapy, and rehabilitative delivery.

Meditation forms part of Asian religion and philosophy, and is a traditional and effective intervention for both mental and psychological conditions, such as depression, anxiety, and various stress-related physical symptoms.[10] Meditation essentially consists of a person sitting

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upright in a comfortable position and concentrating on a single point continuously with mindfulness and attention. Meditation has its origins in the religious practices of India, including Zen and yoga. It is considered to be an emotion-focused method of coping that does not aim to alter the sources of stress. Empirical studies of meditation have confirmed significant improvements in physiological and psychological functioning, such as body flexibility,[11] perceptibility,[12] cerebral activation, immune system function,[13,14] emotional calming,[15–17] and cognitive arousal and activation.[18–20]

Stress and strain are universal experiences in people's lives, and are of serious concern to psychologists and medical and health professionals. In a rapidly developing and globalizing world, the competitiveness and pursuit of material life contribute to the causation and extent of stress felt in daily life. The consequences of stress may be reflected in terms of behavioral, psychological, and physical symptoms.[21–24] Preventative measures, strategic interventions, and effective reduction of stress and strain are important issues in contemporary life. Common interventions for stress reduction include relaxation, meditation, biofeedback training, and emotional outlets. CCH is emerging as a further form of therapy for stress intervention. The main purpose of the present study was to compare the effectiveness of CCH and meditation as methods of stress reduction.

Materials and methods

Participants

Thirty graduate students and staff members were recruited from the National Central University in Taiwan and screened by the 28-item General Health Questionnaire (GHQ-28).[25,26] A cutoff of 4/5 was used to define the level of stress in this study according to the GHQ-28 manual.[25] Participants were randomly assigned to one of three groups, ie, a CCH group (n=10), a meditation (n=10) group, or a control group (n=10). Each participant reported normal or corrected-to-normal vision, and being right-handed with no prior experience of calligraphy or meditation. All participants gave their informed consent to participate in this study.

Procedures

Participants in the three groups received standard treatment in separate rooms that were quiet, well lit, and free from interference. Each group engaged in its respective training activities. Each treatment session lasted 33 minutes and 26 seconds (see Figure 1), with one session per week for 8 consecutive weeks. Before the treatement, there was a 6 minute, 43 second preparatory process. All participants underwent baseline measurements of all physiological parameters in 43 seconds. They sat silently with their eyes open for 2 minutes. They then performed a color test for stress arousal (2 minutes), which was followed by closing their eyes for 2 minutes in preparation for treatment with calligraphy or meditation. After 20 minutes of treatment, the recovery process (6 minutes 43 seconds) was the same as that before treatment. We used the baseline measures (the first 43 seconds) before the treatment as the pre-test physiological parameters and the baseline measures (the second 43 seconds) after the treatment as the post-test physiological parameters. Each participant in the CCH group participated in a standard calligraphy training protocol led by a trained researcher. The content of the Chinese calligraphy characters was chosen at random from a handbook of classic calligraphy writing. All participants used the same sized brushes and normal rice paper. The meditation group was instructed on the details of the standard technique of meditation, which required the participants to mindfully control and focus on deep abdominal breathing with eyes closed. The procedure was the same as

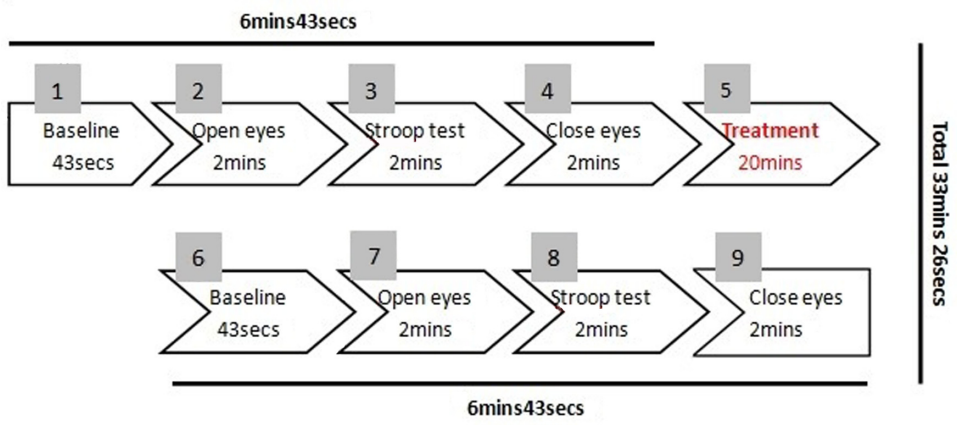

Figure 1 Standard treatment procedure for calligraphy and meditation.
Notes: Stroop test is a demonstration of interference in the reaction time of a task. When the name of a color (eg, "blue," "green," or "red") is printed in a color not denoted by the name (eg, the word "red" printed in blue ink instead of red ink). Participants are asked to identify the printed color. It will arouse some stress states after finishing the Stroop test.
Abbreviations: mins, minutes; secs, seconds.

in the CCH group. Participants in the control group received no particular training during sessions.

Physiological parameters

Changes in heart rate, electromyographic scores, skin temperature, and respiratory rate were measured before, during, and after each treatment session over 8 consecutive weeks. The BioGraph-Pro-Com+ system (Thought Technology Ltd, Montreal, Canada) was used to monitor indicators of stress. To avoid the influence of diurnal fluctuation on physiological parameters, the treatments and measurements were performed at fixed time periods across days.

Stress-related symptoms

The Chinese version of the GHQ-28[25,26] was used to measure the participants' stress symptoms, and consists of four subscales, ie, somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. The test was administered to each participant before the experiment to select participants. The validity and reliability of this test is established to be acceptable.[27–30] In our study, the GHQ-28 had satisfactory internal consistency (Cronbach's alpha 0.96).

Statistical analysis

Effectiveness was tested using the Statistical Package for Social Sciences version 19.0 (IBM Corporation, Armonk, NY, USA). One-way Analysis of Variance (ANOVA) for quantitative variables or chi-square for qualitative variables was used to compare the demographic characteristics and the baselines or the pre-treatment among three groups. Two-way repeated-measures analysis of variance was used to evaluate physiological parameters, with a pre-post contrast effect being the within-group factor and the method of intervention methods as the between groups measure. Post hoc multiple comparisons were performed by using the Last Significant Difference (LSD) adjustment. The paired samples *t*-test was used only when the pre-post main effects were significant within groups.

Results

Sample characteristics

A total of 30 participants (13 males and 17 females, aged 19–35 years) meeting our inclusion criteria were recruited. The demographic and clinical characteristics of the three groups at baseline are shown in Table 1. Results of the ANOVA and the chi-square tests showed that none of the demographics, GHQ total and subscale scores, and physiological parameters had any significant differences among the three groups (all $P>0.05$), except for heart rate (HR) ($P=0.049$).

Table 1 Demographics and baseline measures by treatment group

	CCH group (n=10)	Meditation group (n=10)	Control group (n=10)	*P*-value*
Age, years mean (SD)	24.30 (4.76)	25.00 (4.47)	25.60 (4.88)	0.827
Sex	10	10	10	0.581
Male	5	5	3	
Female	5	5	7	
GHQ, mean (SD)				
Total	1.08 (0.41)	1.13 (0.60)	1.43 (0.66)	0.347
Somatic symptoms	1.13 (0.52)	1.40 (0.82)	1.72 (0.87)	0.223
Anxiety and insomnia	1.29 (0.62)	1.10 (0.87)	1.85 (0.88)	0.108
Social dysfunction	1.09 (0.29)	1.36 (0.48)	1.26 (0.46)	0.353
Severe depression	0.81 (0.47)	0.70 (0.67)	0.87 (0.61)	0.804
Physiological parameters				
HR	86.55 (9.39)	76.70 (7.72)	82.30 (8.24)	0.049*
EMG	7.14 (8.69)	3.75 (1.52)	3.54 (1.89)	0.239
ST	31.15 (4.90)	33.43 (1.40)	33.38 (1.79)	0.194
RR	12.99 (6.13)	17.08 (9.00)	15.76 (4.65)	0.405

Note: *P*$*<0.05.

Abbreviations: GHQ, General Health Questionnaire; HR, heart rate; EMG, electromyography; ST, skin temperature; RR, respiratory rate; SD, standard deviation; CCH, Chinese calligraphic handwriting.

Effects of intervention on physiological arousal

There was a significant difference in the pre-post comparison for heart rate ($F(1,27)=10.960$, $P=0.003$, effect size 0.289). The interaction effect between pre-post and the groups was also significant ($F(2,27)=5.436$, $P=0.010$, effect size 0.287). Paired-samples *t*-tests showed that both CCH ($P=0.003$) and meditation ($P=0.002$) significantly decreased the post-treatment heart rate, but no pre-post difference was found in the control group.

Table 2 Repeated-measures analysis of variance on significant physiological arousal parameters

Effects	*F*	*df*	*P*-value	Effect size
HR				
Pre-post	10.960	1.27	0.003	0.289
Pre-post × group	5.436	2.27	0.010	0.287
EMG				
Pre-post	0.838	1.27	0.368	0.03
Pre-post × group	3.620	2.27	0.04	0.211
ST				
Pre-post	10.540	1.27	0.003	0.281
Pre-post × group	3.981	2.27	0.031	0.228
RR				
Pre-post	18.887	1.27	0.000	0.412
Pre-post × group	16.383	2.27	0.000	0.548

Abbreviations: HR, heart rate; EMG, electromyography; ST, skin temperature; RR, respiratory rate.

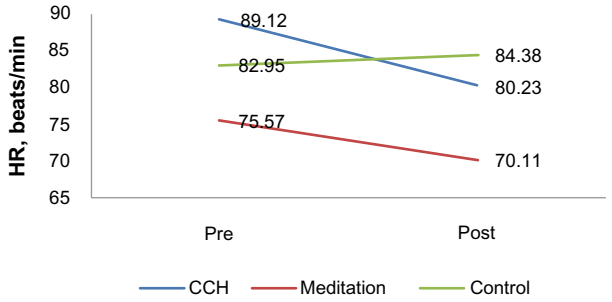

Figure 2 Heart rate pre- and post-treatment for the three groups.
Abbreviation: CCH, Chinese calligraphic handwriting.

There was a significant difference in pre-post scores between the CCH group and the meditation group (P=0.033), with the CCH group showing a greater decline on treatment than the meditation group (see Table 2 and Figure 2).

For the electromyographic data, the interaction effect between pre-post and the groups was significant (F(2,27)=3.620, P=0.040, effect size 0.211). However, there was no significant main pre-post effect (F(1,27)=0.838, P=0.368, effect size 0.030). The two active interventions had a different impact on post-treatment measures. Electromyographic scores in the CCH group increased, but not significantly so. However, the meditation group (P=0.000) and the control (P=0.036) group showed a significant decrease in electromyographic scores after treatment. There was also a significant difference in pre-post changes in scores between the CCH group and the meditation group (P=0.036, see Table 2 and Figure 3).

For skin temperature, both the main pre-post effect (F(1,27)=10.540, P=0.003, effect size 0.281) and the interaction effect (F(2,27)=3.981, P=0.031, effect size 0.228) were statistically significant. The CCH (P=0.019) and meditation interventions (P=0.005) significantly increased the participants' post-treatment skin temperature. Furthermore, the CCH group's ST (1.42) showed greater pre-post rise than ST increased of the meditation group (0.66) after the treatment, while no pre-post difference was found in the control group (see Table 2 and Figure 4).

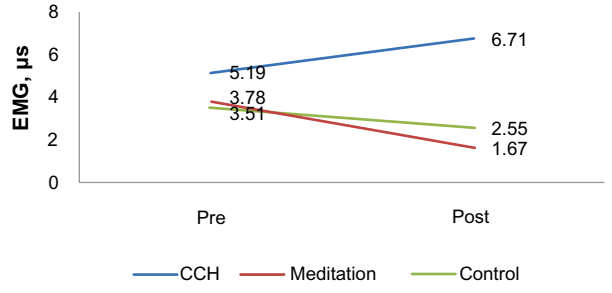

Figure 3 Electromyograghic (EMG) pre- and post-treatment for three groups.
Abbreviation: CCH, Chinese calligraphic handwriting.

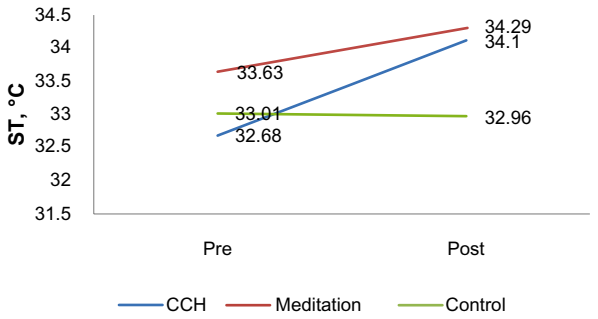

Figure 4 Skin temperature (ST) pre- and post-treatment for three groups.
Abbreviation: CCH, Chinese calligraphic handwriting.

For respiratory rate, the study groups showed different patterns of treatment effect as the intervention proceeded, which was indicated by a significant two-way interaction (F(2,27)=16.383, P=0.000, effect size 0.548). CCH training increased the post-treatment respiratory rate, but the change was not significant. The pre-post changes were significant (see Table 2 and Figure 5) in the meditation (P=0.000) and control (P=0.024) groups. The pre-post changes in the meditation group were significantly different to the changes in the other two groups (P=0.016 versus the CCH group and P=0.013 versus the control group).

Discussion

The present study investigated the effects of CCH training and meditation (an established interventional approach), and compared these with a control group. The results of the present study show that 8 weeks of CCH training had a significant attenuating effect on physiological parameters of arousal (heart rate, electromyographic scores, skin temperature, and respiratory rate) in participants suffering from stress on a daily basis. The effectiveness of CCH compared favorably with that of meditation, which is a well established method for stress reduction. These findings are encouraging, in that CCH represents an equally useful technique for reducing stress.

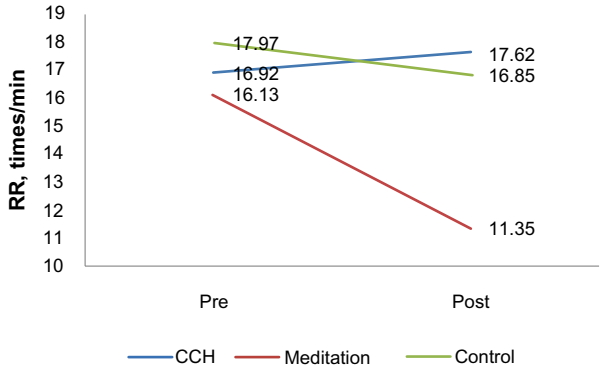

Figure 5 Respiration rate (RR) pre- and post-treatment for the three groups.
Abbreviation: CCH, Chinese calligraphic handwriting.

Specifically, CCH training slowed the heart rate, increased the skin temperature, and decreased the respiratory rate. These results are consistent with the findings of previous studies, ie, that participants experience relaxation and emotional calmness when performing CCH.[9,31] In 2006, Kao argued that the act of brushing required heightened attention and concentration on the part of the practitioner, and thus resulted in emotional stabilization and physical relaxation.[32] It seemed that their bodily activities were inconsistent with their calming mental state, which reflected convincingly that practicing the CCH integrates the mind and the body in this graphonomic process. Further, years of empirical research have found that the act of calligraphic handwriting is capable of improving the writer's cognitive activity.[3–8] A review of the literature on various art therapies, including dance, music, drama, and painting, shows that some of these practices have positive effects on relaxation and emotional expressiveness, but bring about little improvement in the practitioner's cognitive abilities.[33] However, the main difference between art therapies and CCH is that CCH considerably benefits the practitioner's cognitive and verbal scores, while at the same time promoting relaxation and expressiveness. Therefore, this treatment effect may be more significant in people who are particularly vulnerable to behavioral or cognitive impairment, such as adults with Alzheimer's disease and children with attention deficit hyperactivity disorder, as well as those suffering from stress or strain, eg, cancer patients. Further research should investigate whether practicing the writing of different typographical styles of Chinese characters will also bring about changes in physical state, mood, and cognitive ability. If empirically confirmed, we could identify different styles of characters targeting different groups of patients.

Meditation is rapidly becoming a contemporary brand of Oriental medicine. Consistent with other studies of meditation, the present study confirmed that practicing meditation can ameliorate several symptoms of psychological stress, ie, reduce heart rate, increase skin temperature, promote muscle relaxation, and slow the respiratory rate. However, this therapy is generally regarded as emotion-focused, and is not able to address the sources of stress. Recent meditative treatments are more oriented toward mindfulness-based interventions, eg, mindfulness-based cognitive therapy[34] and mindfulness-based stress reduction,[35–37] which are popular in contemporary psychotherapy.

In this regard, researchers have found that the cognitive aspects of mindfulness meditation, such as mindful breathing, may cause changes in the cognitive processes associated with stress management. Trait mindfulness may be predictive of a decreased frequency of negative automatic thoughts during the brief practice of mindfulness training.[38–40] This cognitive improvement enriches the therapeutic function of meditation, and thus establishes it as an effective form of complementary and alternative medicine.

Although this study produced some encouraging results, it has some limitations. First, the sample size was small, and there was a significant difference in mean heart rate between the three groups at baseline. However, subjects in the CCH and meditation groups both showed a significant decrease in heart rate during the study. Secondly, the main pre-post effect was significant, and the mean change for the pre-post measure in the CCH group was pronounced. Thirdly, we undertook no training for participants in the control group. The 20-minute no-treatment regimen required subjects in the control group to sit quietly in a silent room, as for the meditation intervention. Therefore, electromyography scores and respiratory rates decreased significantly, which is also observed with the practice of meditation. Future research needs to consider designing more comprehensive and more efficacious components of CCH.

As traditional methods, both CCH and meditation have positive effects in terms of stress reduction. The main difference between CCH and meditation is that CCH integrates the mind and body during writing in the form of enhanced cognitive facilitation and verbal ability, while still maintaining a relaxed state and physiological slow-down.[8] The results of this study demonstrate that CCH training and meditation are both practical and effective methods for stress reduction.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Kao HSR, editor. *Chinese Calligraphy Therapy*. Hong Kong: Hong Kong University Press; 2000.
2. Xu M, Kao HS, Zhang M, Lam SP, Wang W. Cognitive-neural effects of brush writing of Chinese characters: cortical excitation of theta rhythm. *Evid Based Complement Alternat Med*. 2013;2013:975190.
3. Kao HSR, Chen CC, Chang TM. The effect of calligraphy practice on character recognition reaction time among children with ADHD disorder. In: Roth R, editor. *Psychologists Facing the Challenge of a Global Culture with Human Rights and Mental Health*. Presented at the 55th Annual Convention of the Council of Psychologists, Graz, Austria, July 14–18, 1997.
4. Kao HSR. Chinese calligraphy handwriting for health and rehabilitation of the elderly. Presented at the Second World Congress of the International Society of Physical and Rehabilitation Medicine. Prague, Czech Republic, May 18–22, 2003.
5. Kao HSR, Gao D, Wang M. Brush handwriting treatment of cognitive deficiencies in Alzheimer's disease patients. *Neurobiol Aging*. 2000; 21 Suppl 1:14.

6. Kao HSR, Gao D, Wang M, Cheung HY, Chiu J. Chinese calligraphic handwriting: treatment of cognitive deficiencies of Alzheimer's disease patients. *Alzheimer's Reports*. 2000;3:281–287.
7. Kwok TC, Ba X, Kao HS, Li JC, Ho FK. Cognitive effects of calligraphy therapy for older people: a randomized controlled trial in Hong Kong. *Clin Interv Aging*. 2011;6:269–273.
8. Kao HSR. Calligraphy therapy: a complementary approach to psychotherapy. *Asia Pacific Journal of Counselling and Psychotherapy*. 2010;1:55–66.
9. Yang XL, Li HH, Hong MH, Kao HS. The effectiveness of calligraphy practice and relaxation training in Chinese nasopharyngeal carcinoma patients: a randomized controlled trial. *Int J Nurs Stud*. 2010;47:550–559.
10. Bohlmeijer E, Prenger R, Taal E, Cuijpers P. The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: a meta-analysis. *J Psychosom Res*. 2010;68:539–544.
11. Schure MB, Christopher J, Christopher S. Mind-body medicine and the art of self-care: teaching mindfulness to counseling students through yoga, meditation, and qigong. *J Couns Dev*. 2008;86:47–56.
12. Grant JA, Rainville P. Pain sensitivity and analgesic effects of mindful states in Zen meditators: a cross-sectional study. *Psychosomatic Medicine*. 2009;71:106–114. Available from: http://www.psychosomaticmedicine.org/content/71/1/106.short. Accessed December 3, 2013.
13. Davidson RJ, Kabat-Zinn J. Alterations in brain and immune function produced by mindfulness meditation: three caveats. (Response). *Psychosom Med*. 2004;66:149–152.
14. Austin JH. *Zen and the Brain: Toward an Understanding of Meditation and Consciousness*. London, UK: Massachusetts Institute of Technology Press; 1998.
15. Orme-Johnson DW, Zimmerman E, Hawkins M. Maharashi's vedic psychology: the science of the Cosmic psyche. In: Kao HSR, Sinha D, editors. *Asian Perspectives on Psychology*. New Delhi, India: Sage Publications Inc; 1997.
16. Ott MJ. Mindfulness meditation: a path of transformation and healing. *J Psychosoc Nurs Ment Health Serv*. 2004;42:22–29.
17. Tanner MA, Travis F, Gaylord-King C, Haaga DA, Grosswald S, Schneider RH. The effects of the transcendental meditation program on mindfulness. *J Clin Psychol*. 2009;65:574–589.
18. Brenner MJ, Homonoff E. Zen and clinical social work: a spiritual approach to practice. *Fam Soc*. 2004;85:261–269.
19. Wenk-Sormaz H. Meditation can reduce habitual responding. *Altern Ther Health Med*. 2005;11:42–58.
20. Moore A, Malinowski P. Meditation, mindfulness and cognitive flexibility. *Conscious Cogn*. 2009;18:176–186.
21. Compas BE, Connor-Smith JK, Saltzman H, Thomsen AH, Wadsworth ME. Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychol Bull*. 2001;127:87–127.
22. DeLongis A, Folkman S, Lazarus RS. The impact of daily stress on health and mood: psychological and social resources as mediators. *J Pers Soc Psychol*. 1988;54:486–495.
23. Reiche EM, Nunes SO, Morimoto HK. Stress, depression, the immune system, and cancer. *Lancet Oncol*. 2004;5:617–625.
24. Segerstrom SC, Miller GE. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. *Psychol Bull*. 2004;130:601–630.
25. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. *Psychol Med*. 1979;9:139–145.
26. Chan DW. The Chinese version of the General Health Questionnaire: does language make a difference. *Psychol Med*. 1985;15:147–155.
27. Chan DW, Chan TS. Reliability, validity and the structure of the General Health Questionnaire in a Chinese context. *Psychol Med*. 1983;13:363–371.
28. Shek DT. Reliability and factorial structure of the Chinese version of the General Health Questionnaire. *J Clin Psychol*. 1987;43:683–691.
29. Shek DT. Validity of the Chinese version of the General Health Questionnaire. *J Clin Psychol*. 1989;45:890–897.
30. Shek DT, Tsang SK. Reliability and factor structure of the Chinese GHQ-30 for parents with preschool mentally handicapped children. *J Clin Psychol*. 1995;51:227–234.
31. Guo NF, Kao HSR, Liu X. Calligraphy, hypertension and the type-A personality. *Ann Behav Med*. 2002;23:S159.
32. Kao HSR. Shufa: Chinese calligraphic handwriting (CCH) for health and behavioural therapy. *Int J Psychol*. 2006;41:282–286. Available from: http://www.tandfonline.com/doi/abs/10.1080/00207590544000059#.Upc3LEmS3IU. Accessed December 3, 2013.
33. Duncan AC. Art therapy with patients who have early-stage Alzheimer's disease and mild cognitive impairment. *Art Therapy and Health Care*. 2012:266.
34. Teasdale JD, Segal ZV, Williams JM, Ridgeway VA, Soulsby JM, Lau MA. Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *J Consult Clin Psychol*. 2000;68:615–623.
35. Kabat-Zinn J. *Wherever you go, there you are: Mindfulness Meditation in Everyday Life.* New York, NY: Hyperion; 1994.
36. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice*. 2003;10:144–156.
37. Kabat-Zinn, J, Lipworth L, Burney R. The clinical use of mindfulness meditation for the self-regulation of chronic pain. *J Behav Med*. 1985;8:163–190.
38. Feldman G, Greeson J, Senville J. Differential effects of mindful breathing, progressive muscle relaxation, and loving-kindness meditation on decentering and negative reactions to repetitive thoughts. *Behav Res Ther*. 2010;48:1002–1011.
39. Frewen P, Evans E, Maraj N, Dozois D, Partridge K. Letting go: mindfulness and negative automatic thinking. *Cognit Ther Res*. 2008;32:758–774.
40. Edenfield TM, Saeed SA. An update on mindfulness meditation as a self-help treatment for anxiety and depression. *Psychol Res Behav Manag*. 2012;5:131–141.