

Acute Effects of Qigong Exercise on Mood and Anxiety

Mattias Johansson

Örebro University

Peter Hassmén

Stockholm University and University of Southern Queensland

John Jouper

Örebro University

Psychosocial stress may lead to increased rates of anxiety and depression. Aerobic exercise and mind-body therapies are frequently described as having positive effects on psychological well-being by enhancing mood and reducing anxiety. Few studies, however, have investigated the acute psychological effects of qigong exercise. Fifty-nine regular qigong exercisers (mean age 50.8 years) were randomized to a Qigong or Control group. Pre- and postmeasurements were then compared. POMS-Depression, Anger, and Fatigue, and STAI-State Anxiety scores decreased significantly in the Qigong group but not in the Control group. Results thereby suggest that qigong exercise can produce desirable psychological effects, and Qigong exercise may therefore be included among other activities performed to boost resistance to daily stressors.

Keywords: Qigong, Qi-training, anxiety, mood, emotion

Stress as a result of psychosocial and organizational factors causes widespread ill health in society, and is demonstrated by increasing prevalence rates of musculoskeletal disorders, anxiety, and depression (Bergdahl &

Mattias Johansson and John Jouper, Department of Health Sciences, Örebro University, Sweden; Peter Hassmén, Department of Psychology, Stockholm University, Sweden and University of Southern Queensland, Australia.

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Correspondence concerning this article should be addressed to Mattias Johansson, Department of Health Sciences, Örebro University, SE-701 82 Örebro, Sweden. E-mail: mattias.johansson@hi.oru.se

Bergdahl, 2002; Mellner, Krantz, & Lundberg, 2005; Ursin, 2000). Regular physical activity is frequently used for managing stress, and many studies have also described how exercise can improve mood and reduce anxiety (Berger & Motl, 2001; Ekkekakis & Petruzzello, 1999; Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991). In addition, the use of mind-body therapies, such as Tai Chi, yoga, Qigong, and meditation is frequently reported as a means of coping with anxiety and depression (Wolsko, Eisenberg, Davis, & Phillips, 2004). Increasing evidence suggest that mind-body therapies may alleviate the negative consequences of stress and promote psychological health (Granath, Ingvarsson, von Thiele, & Lundberg, 2006; Jin, 1989; Szabo, Meskó, Caputo, & Gill, 1998).

Slow deliberate movements, relaxed breathing, and deep mental focusing characterize Qigong. Qigong, which originated in ancient China, is a collective name for a number of exercises that, according to traditional Chinese medicine, allow the exerciser to gain control over *qi*, the life-energy, that flows in channels (meridians) in the body (Tsang, Cheung, & Lak, 2002). By performing regular Qigong exercise, the individual may increase the flow of *qi*, and consequently promote health. Research on Qigong indicates beneficial effects on hypertension (Mayer, 1999) and immune function (Ryu et al., 1995). Psychological benefits from regular Qigong training include antidepressant effects (Tsang, Fung, Chan, Lee, & Chan, 2006), self-efficacy (Lee, Lim, & Lee, 2004), and stress reduction (Lee, Ryu, & Chung, 2000).

One suggestion as to why mind-body therapies (e.g., Qigong) can produce beneficial psychological effects has focused on the *relaxation response* (Benson, Greenwood, & Klemchuk, 1975). Specifically, it has been suggested that these mind-body therapies share similar characteristics such as mental focusing, by using relaxed bodily positions or movements, encouraging a passive attitude, and requiring a quiet environment. These are characteristics that together may elicit the relaxation response; a state characterized by decreased sympathetic nervous system activity. The relaxation response has also been described as the opposite to the stress response, and is associated with reduced metabolism, lowered heart rate and blood pressure, and reduced respiratory rate (Benson et al., 1975).

Research on the acute psychological effects of Qigong is, however, limited. One study (Lee, Kang, Lim, & Lee, 2004) reported reduced anxiety after a 1-hr Qigong exercise in a group of Korean men. If exercise adherence is to be achieved long-term, it is likely that a shorter bout of exercise is more conducive than a longer bout. Although, not previously studied, our hypothesis was that even a short Qigong session would yield positive psychological benefits greater in magnitude than those occurring in a physically inactive control group. The purpose of this study was therefore to study the acute effects on mood and anxiety after 30 minutes of Qigong exercise, and to compare the active exercise group with a nonactive control group.

METHOD

Participants

The study was carried out at the annual Biyun summer school, a 4-day training camp held at a health center in central Sweden, and was conducted in accordance with requirements of the Swedish Central Ethical Review Board. We presented the aim of the study during the first day of the Qigong training camp to the 75 attendees, of which 61 subsequently agreed to participate (81%). After having received further information, a written informed consent was signed by those partaking in the study. In total, 59 individuals completed the inventories and were thereby included in the study (8 men and 51 women).

This distribution between men and women is approximately representative of the population because there is a majority of women in the Swedish Biyun Qigong Association (102 men & 1348 women; G. Jacobsson, personal communication, January 23, 2007). The mean age was 50.8 ($SD = 12.9$) years and the participants had been practicing Qigong for an average of 4.8 ($SD = 3.1$) years. There were 35 Qigong exercisers (individuals who had taken the basic Qigong course, Jichu Gong) and 24 Qigong instructors (individuals who had taken several Qigong courses) in the group.

Instrumentation

To measure mood, we used the Swedish version of the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992). The POMS consists of 65 items assessing six mood states: Tension/Anxiety, Depression/Dejection, Anger/Hostility, Vigor/Activity, Fatigue/Inertia, and Confusion/Bewilderment. The respondents rate their feelings on a 5-point (0–4) intensity scale. The response set “How are you feeling right now?” was chosen in this study. The POMS is one of the most frequently used mood measures in sport and exercise psychology (LeUnes & Burger, 1998).

We also used the Swedish version of the State and Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). To measure state anxiety, the Y1-form, which consists of 20 statements, was used. Respondents rated their level of anxiety on a 4-point (1–4) intensity scale from *not at all* to *very much so*. The STAI has strong psychometric qualities (Gauvin & Spence, 1998). We chose the STAI to allow for comparisons with the Lee et al. (2004) Qigong study.

Procedure

A randomized controlled repeated-measures design was employed in this study with participants assigned randomly to either a Qigong or Control group after matching for age, instructor versus exerciser, and gender. On the morning of the study (second day of the Qigong training camp), the entire group first completed the two inventories (POMS & STAI-Y1). Subsequently, those assigned to the Qigong condition did Jichu Gong, the basic Qigong form of the Biyun School for 30 minutes. Jichu Gong consists of a short relaxation phase, then Qigong exercises, and finally self-massage for a few minutes. During the Qigong session, the exerciser uses slow movements and mental concentration while systematically going through their body, with a focus on the joints, inducing relaxation in the whole body (Fan, 2000). A tape recording with instructions and Chinese music directed the Qigong training. The Control group listened to a 30-min lecture with Fan Xiulan (Biyun founder and Qigong master) about traditional Chinese medicine. Immediately after the Qigong exercise, the participants of the Qigong group joined the Control group to again complete the POMS and STAI-Y1.

Analyses

To rule out possible preintervention differences between the Qigong and Control group, independent *t* tests were performed including all dependent variables. Subsequently, separate Time (Pre – Post) \times Group (Qigong – Control) mixed ANOVAs were carried out to detect differences between the groups over time. Bonferroni corrections were used to reduce the risk for Type I-errors because of multiple tests, resulting in an alpha level of $p < .007$ (that is, $.05/7$).

RESULTS

Two of the 61 individuals who volunteered to participate were excluded from the Qigong group because of incomplete data. This resulted in a total of 59 participants (28 in the Qigong group and 31 in the Control group). Independent *t* tests revealed no significant gender differences for years of training (Men, $M = 3.8$, $SD = 3.0$; Women, $M = 5.0$, $SD = 3.1$), Age (Men, $M = 53.8$, $SD = 16.0$; Women, $M = 50.3$, $SD = 12.4$), prescores on STAI-Y1 (Men, $M = 42.4$, $SD = 6.8$; Women, $M = 39.2$, $SD = 4.8$), or on any of the six POMS-subcales; Tension (Men, $M = 9.4$, $SD = 7.5$; Women, $M = 6.5$, $SD = 4.8$), Depression (Men, $M = 8.1$, $SD = 7.1$; Women, $M =$

Table 1. Means and Standard Deviations (\pm) for STAI-Y (State Anxiety) and the Six POMS Subscales for the Qigong ($n = 28$) and Control ($n = 31$) Group Before and After the Intervention

Group	Time	S-Anxiety	Tension	Depression	Anger	Vigor	Fatigue	Confusion
Qigong	Pre	39.5 \pm 5.4	6.7 \pm 5.1	6.8 \pm 8.6	2.8 \pm 4.2	14.8 \pm 7.0	6.0 \pm 5.5	5.5 \pm 3.0
	Post	34.8 \pm 5.0	2.4 \pm 2.7	2.7 \pm 5.2	0.6 \pm 1.3	18.8 \pm 7.9	2.5 \pm 4.0	2.9 \pm 2.2
Control	Pre	39.7 \pm 5.1	7.0 \pm 5.5	6.5 \pm 7.0	2.9 \pm 4.7	14.1 \pm 5.1	4.9 \pm 4.1	6.1 \pm 3.5
	Post	38.2 \pm 4.8	5.5 \pm 4.6	6.0 \pm 8.7	3.2 \pm 6.2	14.5 \pm 6.5	5.3 \pm 4.6	4.6 \pm 2.6

6.4, $SD = 7.8$), Anger (Men, $M = 2.9$, $SD = 3.8$; Women, $M = 2.9$, $SD = 4.5$), Vigor (Men, $M = 13.5$, $SD = 7.9$; Women, $M = 14.6$, $SD = 5.8$), Fatigue (Men, $M = 4.9$, $SD = 5.0$; Women, $M = 5.5$, $SD = 4.8$), Confusion (Men, $M = 7.6$, $SD = 4.4$; Women, $M = 5.5$, $SD = 3.1$). Therefore, subsequent analyses were performed on data collapsed for gender. Mean and standard deviations for the seven dependent variables (STAI-Y1 and the six POMS-subscales) are presented in Table 1. No significant differences (all $ps > .05$) between the Qigong and Control group on any of the dependent variables were detected preintervention, indicating that matching/randomization was successful.

Statistical analyses on the scores on the STAI and all POMS-subscales, except Anger, revealed significant main effects of Time: State Anxiety, $F(1, 57) = 29.42$, $\eta^2 = .34$, power = 1.0, $p < .0005$; Tension, $F(1, 57) = 26.17$, $\eta^2 = .32$, power = 1.0, $p < .0005$; Depression, $F(1, 57) = 17.10$, $\eta^2 = .23$, power = .98, $p < .0005$; Vigor, $F(1, 57) = 8.49$, $\eta^2 = .13$, power = .82, $p < .005$; Fatigue, $F(1, 57) = 11.21$, $\eta^2 = .16$, power = .91, $p < .001$; and Confusion, $F(1, 57) = 33.12$, $\eta^2 = .37$, power = 1.0, $p < .0005$. No significant main effects of Group were detected.

Time by Group interactions were significant for: STAI, $F(1, 57) = 7.67$, $\eta^2 = .12$, power = .78, $p < .008$; Depression, $F(1, 57) = 10.61$, $\eta^2 = .16$, power = .89, $p < .002$; Anger, $F(1, 57) = 8.41$, $\eta^2 = .13$, power = .81, $p < .0005$; and Fatigue, $F(1, 57) = 18.06$, $\eta^2 = .24$, power = .99, $p < .0005$.

DISCUSSION

The aim of this study was to investigate the acute effects of a 30-min Qigong exercise on anxiety and mood using the Y1-form of the State and Trait Anxiety Inventory and the six subscales of the Profile of Mood States. The hypothesis was that reduced anxiety and improvements of mood would result in the Qigong group but not in the Control group. Our results partially support this hypothesis. Interaction effects show that State Anxiety, Depression, Anger, and Fatigue scores were significantly reduced in the Qigong group but not in the Control group. Mean scores were also reduced between

pre- and postmeasurements for Tension, Vigor, and Confusion in the Qigong group (and greater than those for the controls), but they were not significantly different from the Control group.

Qigong exercise was, as stated above, not more effective in reducing Tension and Confusion or increasing Vigor than listening to a lecture. Fan Xiulan, Qigong master and creator of the Biyun method, is an important person for the participants in this study. Perhaps the impact of her lecture was comparable to that of a bout of Qigong exercise on some POMS subscales. If this was the case, then it is not completely surprising that Confusion was reduced also in the lecture group, considering the rather cognitive content of the lecture. A second control group engaged in an alternative activity might have helped answer this question.

Previous Qigong research describes a reduction in anxiety by 26% when comparing pre- and postmeasurements separated by 60 minutes of exercise (Lee et al., 2004). The reduction detected in the present study, using the same inventory (STAI), was 12% after 30 minutes of Qigong exercise. This can clearly not be taken to indicate a dose—response relationship but warrants further research, not only to verify that Qigong exercise reduces anxiety but also to investigate whether greater effects can be expected after longer exercise periods. The results of this study (even when analyzed with caution) nevertheless point in the same direction as other articles describing positive effects on state anxiety from various types of physical activity (Petruzzello et al., 1991), including walking (Porcari et al., 1988), and Tai Chi (Jin, 1989).

Both the present study and the study performed by Lee et al. (2004) relied on experienced Qigong exercisers; participants in this study had been practicing Qigong for an average of 4 years. Consequently, it is difficult to conclude that the anxiolytic effect of a single bout of exercise described both in this study and in the study by Lee et al. will also occur in less experienced individuals. Some time may be needed for the exerciser to master the mental techniques and movements of Qigong to relax and elicit the relaxation response. The regular elicitation of the relaxation response is known to decrease sympathetic nervous system reactivity, thereby alleviating the effects of stress (Hoffman et al., 1981). Thus, our positive results on acute mood and anxiety are not surprising, provided that Qigong exercise is performed on a regular basis.

In addition to enlisting experienced Qigong exercisers, the participants of this study were self-selected. This may have attracted those who are excessively optimistic about the effects of Qigong training resulting in them reporting extra positive effects, thereby constituting a self-fulfilling prophecy (Jin, 1989). Assessments of the participants' expectancies of the acute Qigong benefits could have been included when premeasures were taken. There is therefore a possibility that the benefits of Qigong exercise found in this study are not entirely accounted for by Qigong exercise per se (even

though it seems likely that the characteristics of Qigong exercise may elicit the relaxation response); participants' expectancies of positive outcomes may also play a part in affecting post measurements. A bias in favor of reporting beneficial responses in the Qigong group but not in the Control group may seem feasible because of unfulfilled expectations (the participants went to the camp to exercise Qigong, not to be part of a control group). However, as the camp-program includes Qigong exercise and lectures by the founder/Qigong master (an important person for the Qigong exercisers), the risk for disappointment because of unfulfilled expectations for those included in the Control group is most likely small. The fact that the two groups in this study were created through randomization from the same pool of subjects nevertheless suggests that Qigong exercise produces an additional effect over a nonactive pursuit such as listening to a lecture. It is particularly interesting, from an exercise adherence perspective, to see that even after several years of regular Qigong exercise (presumably having calming effects on the individuals), a single Qigong session still induces beneficial effects on mood and anxiety.

Other factors besides the relaxation response may be relevant in explaining the beneficial psychological responses in this study, as Qigong exercise includes a number of different components. Focusing on the internal body, repetitive tasks and slow breathing, all of which are activities associated with increased parasympathetic tone, may lead to restorative processes and recovery (Recordarti, 2003). Biyun Qigong also includes self-massage, an activity that has been shown to lead to secretion of the hormone oxytocin, and the *calm-and-connection response*, which results in attenuation of arousal and stress levels (Uvnäs-Moberg, Arn, & Magnusson, 2005). Finally, the *broaden-and-build theory* (Fredrickson, 2000) suggests that by engaging in relaxation techniques like Qigong, positive emotions (e.g., contentment) can be cultivated. Positive emotions may release the hold that negative emotions like depression and anxiety may have over the individual's psychological and physiological responses. Contentment may create an appreciation for the present moment and one's place in the world, and has been shown to shorten the duration of cardiovascular arousal produced by negative emotions (Fredrickson & Levenson, 1998). Thus, the multidimensional nature of Qigong exercise may affect the exerciser positively by different pathways, promoting health, wellbeing, and stress reduction.

In conclusion, the results of this study support the evidence of Qigong exercise for mental health benefits. Although more studies are needed to verify these findings, our results suggest that health professionals can include Qigong exercise among those activities that are recommended for psychological benefits.

REFERENCES

- Benson, H., Greenwood, M. M., & Klemchuk, M. M. (1975). The relaxation response: Psychophysiological aspects and clinical applications. *International Journal of Psychiatry in Medicine*, 6, 87–98.
- Bergdahl, J., & Bergdahl, M. (2002). Perceived stress in adults: Prevalence and association of depression, anxiety and medication in Swedish populations. *Stress and Health*, 18, 235–241.
- Berger, B. G., & Motl, R. (2001). Physical activity and quality of life. In R. Singer, H. A. Hausenblas, & C. Janelle (Eds.), *Handbook of sport psychology* (pp. 636–671). New York & Chichester: Wiley.
- Ekkekakis, P., & Petruzzello, S. T. (1999). Acute aerobic exercise and affect. Current status, problems and prospects regarding dose-response. *Sports Medicine*, 28, 337–374.
- Fan, X. (2000). *Qigong enligt Biyun. Låt livskraften återvända [Biyun Qigong. Letting the life-force return]*. Stockholm: Svenska Förlaget.
- Fredrickson, B. L. (2000). Cultivating positive emotions to optimize health and well-being. *Prevention & Treatment*, 3. Retrieved June 11, 2007, from <http://www.unc.edu/peplab/publications.html>
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion*, 12, 191–220.
- Gauvin, L., & Spence, J. C. (1998). In J. L. Duda (Ed.) *Advances in sport and exercise psychology measurement* (pp. 325–336). Morgantown, WV: Fitness Information Technology.
- Granath, J., Ingvarsson, S., von Thiele, U., & Lundberg, U. (2006). Stress management: A randomized study of cognitive behavioral therapy and yoga. *Cognitive Behaviour Therapy*, 35, 3–10.
- Hoffman, J. W., Benson, H., Arns, P. A., Stainbrook, G. L., Landsberg, L., Young, J. B., & Gill, A. (1981). Reduced sympathetic nervous system responsivity associated with the relaxation response. *Science*, 215, 190–192.
- Jin, P. (1989). Changes in heart rate, noradrenalin, cortisol and mood during Tai Chi. *Journal of Psychosomatic Research*, 33, 197–206.
- Lee, M. S., Ryu, H., & Chung, H.-T. (2000). Stress management by psychosomatic training: Effects of ChundoSunBup qi-training on symptoms of stress: A cross-sectional study. *Stress Medicine*, 16, 161–166.
- Lee, M.-S., Lim, H.-J., & Lee, M. S. (2004). Impact of Qigong exercise on self-efficacy and other cognitive perceptual variables in patients with essential hypertension. *The Journal of Alternative and Complementary Medicine*, 4, 675–680.
- Lee, S. L., Kang, C.-W., Lim, H.-J., & Lee, M.-S. (2004). Effects of Qi-training on anxiety and plasma concentrations of cortisol, ACTH, and aldosterone: A randomized placebo-controlled pilot study. *Stress and Health*, 20, 243–248.
- LeUnes, A., & Burger, J. (1998). Bibliography on the Profile of Mood States in sport and exercise psychology research, 1971–1998. *Journal of Sport Behavior*, 21, 53–70.
- Mayer, M. (1999). Qigong and hypertension: A critique of research. *The Journal of Alternative and Complementary Medicine*, 5, 371–382.
- McNair, D. M., Lorr, M., & Droppleman, L. F. (1992). *EdITS manual for the Profile of Mood States*. San Diego, CA: EdITS.
- Mellner, C., Krantz, G., & Lundberg, U. (2005). Medically unexplained symptoms in women as related to physiological stress responses. *Stress and Health*, 21, 45–52.
- Petruzzello, S. J., Landers, D. M., Hatfield, B. D., Kubitz, K. A., & Salazar, W. (1991). A meta-analysis on the anxiety-reducing effects of acute and chronic exercise. Outcomes and mechanisms. *Sports Medicine*, 11, 143–182.
- Porcari, J. P., Ward, A., Morgan, W., Mance, M., Ebbeling, C., Kline, G., et al. (1998). Effect

- of walking on state anxiety and blood pressure. *Medicine and Science in Sports and Exercise*, 20, S85.
- Recordati, G. (2003). A thermodynamic model of the sympathetic and parasympathetic nervous system. *Autonomic Neuroscience: Basic & Clinical*, 103, 1–12.
- Ryu, H., Mo, Y. H., Mo, G. D., Choi, B. M., Chang, D. J., Seo, C. M., et al. (1995). Delayed cutaneous hypersensitivity reactions in Qigong (ChunDoSunBup) trainees by multitest cell mediated immunity. *American Journal of Chinese Medicine*, 23, 139–144.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Szabo, A., Meskó, A., Caputo, A., & Gill, É. T. (1998). Examination of exercise-induced feeling states in four modes of exercise. *International Journal of Sport Psychology*, 29, 376–390.
- Tsang, H. W. H., Cheung, L., & Lak, D. C. C. (2002). Qigong as a psychosocial intervention for depressed elderly with chronic physical illnesses. *International Journal of Geriatric Psychiatry*, 17, 1146–1154.
- Tsang, H. W. H., Fung, K. M. T., Chan, A., Lee, G., & Chan, F. (2006). Effect of a Qigong exercise program on elderly with depression. *International Journal of Geriatric Psychiatry*, 21, 890–897.
- Ursin, H. (2000). Psychosomatic medicine: State of the art. *Annals of Medicine*, 32, 323–328.
- Uvnäs-Moberg, K., Arn, I., & Magnusson, D. (2005). The psychobiology of emotion: The role of the oxytocinergic system. *International Journal of Behavioral Medicine*, 12, 59–65.
- Wolsko, P. M., Eisenberg, D. M., Davis, R. B., & Phillips, R. S. (2004). Use of mind-body medical therapies. Results of a national survey. *Journal of General Internal Medicine*, 19, 43–50.