

## Effects of Scheduled *Qigong* Exercise on Pupils' Well-Being, Self-Image, Distress, and Stress

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### Abstract

**Objectives:** Psychologic problems is increasing among pupils and has become a major problem in Sweden as well as in other Western countries. The aim of this study was to explore whether scheduled *qigong* exercise could have an effect on well-being at school, psychologic distress, self-image, and general stress.

**Subjects:** Pupils, 13–14 years, were assigned to either a *qigong* group or a control group.

**Intervention:** The *qigong* group had scheduled *qigong* 2 times a week for 8 weeks.

**Measures:** Self-reported well-being at school, psychologic distress, self-image, and stress were measured pre- and postintervention.

**Results:** The control group had reduced well-being at school during the semester and the *qigong* group was stable. The *qigong* group reduced psychologic distress and stress, and had a tendency to improved self-image, whereas no changes were found in the control group. Self-image explains 47% ( $R^2 = 0.47$ ) of well-being at school, and stress explains 29% ( $R^2 = 0.29$ ) of psychologic distress.

**Conclusions:** Scheduled *qigong*, meditative movement, is a possible way to improve well-being at school.

### Introduction

PSYCHOLOGICAL HEALTH among youths is a major problem in modern society.<sup>1,2</sup> External as well as internal psychologic problems increased among pupils between 1950 and 1980, and after 1980 internal but not external psychologic problems continued to increase.<sup>3</sup> Such problems are accentuated among 15 years olds in Sweden when compared with 11 European countries.<sup>3, pp. 102, 371–374</sup> Reactions to stress, somatic complaints such as headaches, stomach pain, back pain, and dizziness as well as psychologic complaints such as difficulty sleeping, irritation, nervousness, and low mood increases with age during adolescence.<sup>4</sup> Substantial gender differences show that girls report more symptoms than boys,<sup>3, pp. 17–19</sup> and between 1998 and 2003 the number of teenage girls hospitalized for depression and anxiety had increased eight times.<sup>3, pp. 85–87</sup> School is an important factor for children's well-being,<sup>2,5</sup> and to improve youths' well-being, several preventative actions such as scheduled methods for coping with stress, and scheduled information on stress and meditation are suggested.<sup>3</sup>

Stress level in school is dependent on how pupils experience four major areas: school conditions, social relationship, means for self-fulfillment, and general health status.<sup>6,7</sup>

Measuring well-being, self-image, distress, and stress are indicators for pupils' situation in school. Seeing oneself as an objectified body that should be modulated to fit such (school) conditions may increase the level of stress.

Intense external focus is a hallmark of modern society and rendering into an objectification of the individual. Unbalanced by an inner focus, internal signals become increasingly unknown. The appearance of things assumes overall importance and the body becomes an object to mold and form rather than a living and feeling part of our whole being. Such objectification has detrimental effects on cognitive functioning as well as on creativity<sup>8</sup> and has substantial effects on self-image as it tends to increase anxiety and shame at not being good enough in the eyes of others.<sup>9–11</sup> The intense external focus has roots in the perception that well-being is found on the outside and happiness is solely tied to external forces. To enhance well-being among children and youths, stress-reducing methods that aim to strengthen and develop innate potentials, enhance concentration, establish an inner focus, and heighten the awareness of mind-body as an organic whole are needed.<sup>12</sup> Such health-promoting and stress-reducing methods are available in mindfulness and *qigong*.<sup>13–15</sup>

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## Qigong

*Qigong* is an ancient art and science of health care and energy management that has been practiced in China for thousands of years.<sup>16</sup> Recently, *qigong* was defined for Westerners as meditative movement exercise.<sup>17</sup> Multifaceted health benefits of *qigong* practice have been established in clinical as well as in nonclinical samples<sup>18</sup> using a variety of physiologic, biochemical, and psychologic measures. Research indicates that *qigong* training can be an effective method of stress management<sup>16,19–21</sup> and enhances quality of life.<sup>22–24</sup> *Qigong* has also been reported to reduce psychologic symptoms,<sup>25–27</sup> improve sleep, lessen headaches and bodily pain,<sup>21,28</sup> and have a beneficial effect on cardiovascular disease.<sup>24</sup> Witt et al.<sup>14</sup> reported that pupils practicing *qigong* in school improved in social behavior and showed stable grades, and that inappropriate behavior decreased. Furthermore, they mention that *qigong* exercise had calming effects on the children and lessened aggressiveness. Several children who spontaneously reported that they found it easier to sleep since starting *qigong* also showed indications of increased health and fewer sick days.<sup>14</sup> Lee et al.<sup>28</sup> suggest that these health benefits might result from the reduction of psychologic and physical stresses and the stabilization of the human body, so-called homeostasis, via the neuroendocrine system.

*Qigong*, meditative movement exercise, has shown many beneficial health effects in adults, and there are also promising indications that youths likewise can improve health. However, there is limited knowledge about *qigong* in school, and whether youths can improve their well-being, reduce stress, change self-images, and use *qigong* as a coping strategy.

The aim of this study was to study whether scheduled *qigong* exercise affects well-being at school, psychologic distress, self-image, and general stress in pupils aged 13–14 years.

## Materials and Methods

### Participants

Participants, pupils in 7th grade, were recruited from schools in two towns in the south of Sweden. To ensure demographic similarity, one of two parallel classes in each school was assigned to either a *qigong* group or a control group. Of 156 pupils 13–14 years of age (boys  $n=77$ ,  $M=13.2$  and girls  $n=79$ ,  $M=13.1$ ), 71 were assigned to the control group and 85 to the *qigong* group. Pupils who did not

answer both pre- and postformula (9 pupils, 5 boys and 4 girls) were excluded from the study, as were those in the *qigong* group who exercised on fewer than 8 occasions (13 girls and 15 boys). A total of 119 pupils, 53 in the *qigong* group (29 girls and 24 boys) and 66 in the control group (32 girls and 34 boys), took part in the study (Table 1). All pupils in the participating classes were asked to participate and no group of students was excluded. It is, however, likely that some of the pupils who choose not to participate frequently (on fewer than 8 occasions) share motives for this. No information is available of motives for absence. No significant differences were found in pretest scores between *qigong* and control groups.

### Measurements

*Well-being at school* was tested with a scale (WBS) consisting of five statements formulated for this study: "I feel well in class"; "I do well at school"; "I have several friends in my class"; "I enjoy school"; "I am well liked at school." Alternatives for answers are "often," "sometimes," "seldom," "never," and are scored on a scale from 1 (never) to 4 (often). The psychometric properties of this scale seem adequate judging from face validity, correlations to standardized tests used in this study, items homogeneity ( $\alpha=0.74$ ) and an ongoing validation study (Terjestam and Årestedt, in preparation). The scale was constructed for use in the present study, and no further psychometric information is available.

*Psychologic distress* was tested with the Psychologic distress scale<sup>29</sup> elaborated for use in populations of children.<sup>30</sup> The scale measures the frequency of familiar psychologic symptoms. The original scale has been used in various studies and has been validated in psychiatric as well as nonclinical studies and in comparison with the Langer psychologic-equilibrium index.<sup>29</sup> This version elaborated by Sagy and Dotan<sup>30</sup> comprises five statements: "I have problems sleeping"; "I feel dizzy"; "I have a headache"; "My stomach aches"; "My neck or back aches"; and is scored on a scale from 1 to 4; low scores denote low levels of psychologic distress and high scores indicate high levels of distress. Cronbach's  $\alpha$  for the five items in the present study was 0.78.

The *self-image* test "I think that I am" is composed of statements to be accepted or rejected.<sup>31</sup> Five different aspects of self-esteem have been identified by means of factor analysis: "Physical characteristics," "Skills and talents," "Psychologic well-being," "Relation to parents," and "Relation to others." Additionally, a "Total score" is obtained. In this study, the total score was used to test differences. Each statement has four response alternatives: "I totally agree," "I agree," "I don't quite agree," "I don't agree at all." The scores of each question vary between +2 and -2. "I think that I am" is frequently used in studies of children in Sweden. Previous studies have shown the test to have adequate psychometric properties.<sup>31</sup> Evidence for its validity is the finding that lower scores characterize diffident, withdrawn children, and "problem children," as judged by their teachers. High test-retest coefficients (2-year interval) show that self-image can be studied in a reliable way with this test.<sup>31, p. 18</sup>

To test *general stress*, a scale consisting of three statements was formulated: "I feel stressed at home," "I feel stressed at school," and "I feel stressed among friends." Response alternatives were "often," "sometimes," "seldom," "never,"

TABLE 1. SHOW GENDER, AGE, AND MEAN AGE FOR PARTICIPANTS IN QIGONG AND CONTROL GROUPS

Group	Gender	Age			Mean age	N
		12	13	14		
Qigong group	Boy	0	17	7	13.3	24
	Girl	1	23	5	13.1	29
Total		1	40	12	13.2	53
Control group	Boy	1	29	5	13.1	35
	Girl	0	29	2	13.1	31
Total		1	58	7	13.1	66

with scores varying from 1 (never) to 4 (often). The internal homogeneity of the items was adequate (Cronbach's  $\alpha = 0.71$ ). This scale was developed for this study and no other psychometric properties of the scale are therefore available.

Furthermore, at postcondition the pupils in the *qigong* group answered an *open question* in the formula on whether the *qigong* practice had affected them and if so, to explain how they experienced the effect.

### Procedure

The pupils completed the self-reported formula in class, administered by 2 research- and assessment-trained instructors, before *qigong* was introduced to the *qigong* group (precondition). No activities were arranged for the control group; they had normal school activities during the study. Ten (10) weeks after precondition, both groups again completed the formula (postcondition). Between the pre- and postconditions, *qigong* was scheduled and the *qigong* group practiced twice a week for 8 weeks, supervised by experienced *qigong* teachers. The *qigong* practiced was "Peace Power *Qigong*,"<sup>32</sup> meditative movement exercise (few minutes of relaxation, five sets of movements, and self-massage) during 25 minutes performed in the schools sport halls.

### Ethics

Parents were informed orally of this study at a school meeting. They also received written information to be returned to the school with a signed consent for the child to participate in the study. Participants were told that they could terminate practice at any time. The Research Ethics Committee at Linköping University (Dnr. 131-06) approved the study.

### Analysis

Pearson's bivariate correlation was used to identify significant correlations between variables and a stepwise multiple regression analysis were made to find the variable that have the strongest impact. Effects of *qigong* training were tested with analysis of variance (ANOVA) of repeated-measures within-subject design. Differences between the research and the control group at precondition were tested by one-way ANOVA and Bonferroni adjusted to reduce risk of type I errors because of multiple tests, resulting in an  $\alpha$  level of  $p < 0.013$  (that is,  $0.05/4$ ). Due to incomplete answers in the *qigong* group (1 pupil in the self-image test),  $N$  differ slightly in statistical test on self-image.

### Results

There are small differences between pre- and post-tests showing some significant results. After Bonferroni adjustment, they are more of a tendency and significant on a 10% level.

#### Well-being at school

Mean and standard deviation (SD) for the five items, where 1 means *never* feel well-being and 4 *often* feel well-being, were (pre) M 3.46, SD 0.53, (post) M 3.46, SD 0.50, in the *qigong* group and (pre) M 3.53, SD 0.33, (post) M 3.42, SD

0.48, in the control group. Repeated measure of ANOVA showed a significant difference in the control group ( $F_{1.65} =$ ,  $p \leq 0.02$ ), but not in the *qigong* group. The control group thus has reduced their well-being at the end of semester and the *qigong* group has stayed stable during the semester (Table 2).

#### Psychologic distress

Mean and SD for the five items, where 1 denotes low level and 4 high level of psychologic distress, were (pre) M 2.2, SD 0.62, (post) M 2.0, SD 0.63 for the *qigong* group, and (pre) M 2.0, SD 0.62, (post) M 2.0, SD 0.65 for the control group. Repeated measure of ANOVA showed a significant difference in the *qigong* group ( $F_{1.52} = 4.75$ ,  $p \leq 0.05$ ), but not in the control group. *Qigong* exercise thus has reduced psychologic distress (Table 2).

#### Self-image

Mean and SD for the five items, scores ranged from +2 (high self-image) to -2 (low self-image), were (pre) M 0.81, SD 0.51, (post) M 0.87, SD 0.51 for the *qigong* group, and (pre) M 0.94, SD 0.44, (post) M 0.92, SD 0.57 for the control group. Repeated measure of ANOVA showed a tendency difference in the *qigong* group ( $F_{1.51} = 3.24$ ,  $p = 0.078$ ), but not in the control group, meaning that the *qigong* group has a tendency to improved self-image (Table 2).

#### Stress

Mean and SD for the three items, where 1 means *never* feel stress and 4 *often* feel stress, were (pre) M 2.2, SD 0.71, (post) M 2.0, SD 0.73 for the *qigong* group, and (pre) M 2.0, SD 0.61, (post) M 2.0, SD 0.65 for the control group. Repeated measure of ANOVA showed a significant difference in the *qigong* group ( $F_{1.52} = 5.44$ ,  $p \leq 0.02$ ), but not in the control group, meaning that *qigong* exercise has reduced stress (Table 2).

Tests for gender differences in the *qigong* group showed that girls (pre M 2.3, SD 0.66; post M 2.1, SD 0.59;  $F_{1.28} = 6.63$ ,  $p \leq 0.02$ ) but not boys (pre M 2.0, SD 0.51; post M 1.9, SD 0.69) reported significantly less psychologic distress after 8 weeks of scheduled exercise. No differences were found regarding well-being at school and self-image. A significant difference regarding stress revealed that boys (pre M 2.1, SD

TABLE 2. MEAN AND STANDARD DEVIATION (SD) ON THE TESTS "PSYCHOLOGIC DISTRESS," "WELL-BEING AT SCHOOL," "SELF-IMAGE," AND "STRESS" IN PRE- AND POSTCONDITION BETWEEN QIGONG AND CONTROL GROUPS

Test	Group	Precondition	Postcondition
		M ± SD	M ± SD
Psychologic distress	<i>Qigong</i>	2.2 ± 0.62	2.0 ± 0.63*
	Control	2.0 ± 0.62	2.0 ± 0.65
Well-being at school	<i>Qigong</i>	3.47 ± 0.52	3.46 ± 0.50
	Control	3.53 ± 0.33	3.42 ± 0.48*
Self-image	<i>Qigong</i>	0.82 ± 0.51	0.87 ± 0.51 <sup>(tend)</sup>
	Control	0.94 ± 0.44	0.92 ± 0.57
Stress	<i>Qigong</i>	2.2 ± 0.71	2.0 ± 0.73*
	Control	2.0 ± 0.61	2.0 ± 0.65

\* $p < 0.05$ .

<sup>(tend)</sup> $p = 0.078$ ; SD, standard deviation.

0.60; post M 1.8, SD 0.76;  $F_{1,23} = 5.91, p \leq 0.02$ ) but not girls (pre M 2.4, SD 0.76; post M 2.2, SD 0.67) reported less stress after exercise. Girls score higher on psychologic distress and stress before as well as after intervention, and with regard to low  $n$ , results on gender differences should be considered with care.

### Open question

Regarding responses to the open question on how *qigong* exercise had affected them, 31 of 53 pupils (59%) in the *qigong* group reported that they experienced effects of their *qigong* training. Their descriptions of these effects were variations of the following expressions: "It gives you a chance to calm down" (18 pupils), "I feel more alert and awake" (14 pupils), "It is fun and it makes me feel better" (11 pupils), "My headache disappears" or "I have fewer headaches" (8 pupils), "I am more concentrated" and "I work better after *qigong*" (4 pupils). One (1) pupil explained that when life got "messed up" it helped her to close her eyes and think of *qigong* practice. She gave no further explanation. Four (4) pupils also thought that the whole class was calmer since they started *qigong* practice. Eighteen (18) pupils wrote that they experienced no effects and that they were not motivated to practice. Four (4) pupils were uncertain of any effects.

### Correlation analysis

The dependent variable, well-being at school, correlates significantly with self-image ( $r = 0.65, p < 0.01$ ) and stress ( $r = -0.35, p < 0.01$ ). Self-image and stress were analyzed in a stepwise multiple regression, and the analysis revealed that self-image ( $R^2 = 0.47$ ) predict increased well-being at school. Self-image was found to have the strongest impact on well-being. Improving pupils' self-image will enhance well-being at school.

The dependent variable, psychologic distress, has a negative correlation with self-image ( $r = -0.42, p < 0.01$ ) and a positive correlation with stress ( $r = 0.56, p < 0.01$ ). Self-image and stress were analyzed in a stepwise multiple regression, and the analysis revealed that stress ( $R^2 = 0.29$ ) predict increased psychologic distress at school. Stress was found to have the strongest impact on negative psychologic distress.

### Discussion

The purpose of this study was to determine whether scheduled *qigong* exercise has an effect on psychologic distress, self-image, stress, and well-being at school. The results suggest that it is possible to schedule *qigong* exercise for pupils, 13–14 years, and to receive psychologic benefits from the exercise. The shortcomings of this study should be kept in mind: that no activity was arranged for the control group; the relatively short intervention period, 8 weeks, may be too short for real or lasting enhancements; 18 pupils (34%) experienced no effects and were not motivated to practice scheduled *qigong*; the low  $n$  in the statistical tests on gender differences; that results were more of a tendency after Bonferroni adjustment; and the fact that the *qigong* group scored lower on self-image and higher on stress at baseline compared with control group.

Slightly more than half of the pupils who had participated in the *qigong* exercise reported that they experienced a pos-

itive effect. Most benefits reported by these pupils were "a chance to calm down," "to feel more alert, awake, and feel better," "fewer headaches, more concentrated and better work after *qigong*." These benefits could be explained by stimulation of the neuroendocrine system<sup>28</sup> or just by a "time out" from schoolwork.

The *qigong* group was stable in well-being at school during the semester compared to the control group that had lowered well-being at the end of the semester (December). This is in line with the findings of Witt and colleagues.<sup>14</sup> This adolescent period, 13–14 years, is marked by swift biological, psychologic, and social changes. In Sweden, high school starts in grade seven. It is a period marked by strain for many and will affect behavior and well-being.

Well-being at school correlates with stress and self-image. Self-image had the strongest impact on well-being and is generally known to be related to well-being. There is, however, limited knowledge about the effect of *qigong* exercise on self-image. A prolonged intervention period with scheduled *qigong*, may affect self-image in a positive way.

One major problem among youths is the overall external focus. *Qigong* exercise or meditative movements has a potential to change focus to intrinsic motives including feelings and thereby enhance the ability to cope with perceived stress. Those who satisfy intrinsic motives with *qigong* exercise,<sup>33</sup> thereby suggesting that scheduled *qigong* also is a possible coping strategy.

As many as 34% were not motivated to do the *qigong* exercises. Reasons are not known and have to be further investigated. Spontaneous remarks from these pupils suggest that many of them found the *qigong* exercise boring. Motivation and intention for a new behavior, meditative movements in school, must be strong, otherwise their expected behavior and results will fail to appear. This concerns teachers as well as pupils. To be concentrated during exercise is an important factor for health improvements.<sup>34</sup> This could explain why some pupils have difficulties with *qigong* exercise and should be considered in future studies. Pupils with attentional problems may benefit from meditative movement exercise as also suggested by Hernandez-Reif et al.<sup>35</sup> and Baron and Faubert.<sup>36</sup>

When implementing these techniques at schools, there are some critical factors that need to be addressed. Timing is one such factor, as is the teachers' motivation for the training and the information given to the pupils. If the timing of *qigong* practice competed with other favored activities, the pupils were discouraged. Group reactions, favorable or unfavorable, should also be tended to as they arise. The purpose of introducing *qigong*, meditative movements, in school is to improve pupils' psychologic health (improved well-being, self-image, lower stress, etc.).<sup>3</sup> Concentration, to be "here and now," or to take a "time out," is the key to achieving homeostasis.<sup>28</sup> *Qigong* has to be introduced in a way that motivates pupils to be "here and now." Humans perform activities with different motives as intrinsic-, extrinsic-, and amotives.<sup>33</sup> *Qigong* should be introduced to support these motives. As an example, intrinsic motivated may concentrate on reducing inner muscle tension and on increased self-knowledge; extrinsic motivated may concentrate on "movement perfection" and health benefits; amotivated may create

their own "story," their own self-image to meditative movements. To enhance the pupils' motivation for participating in *qigong* exercises, our recommendations are that the pupils be introduced to the activity by taking part in the decision to try it out; be well informed of the possible and verified benefits of the exercise; be active in arranging the exercises; and take part in discussions of the strengths, shortcomings, and improvement of the procedures.

### Conclusions

To conclude, scheduled *qigong* exercise among 7th-grade pupils may stabilize well-being, and may reduce psychologic distress and perceived stress at school. The gender differences found in this study need to be studied further as well as effects of *qigong* on different aspects of the self. Future studies on the impact of instructors' different didactic methods on effects of the *qigong* exercise are also needed.

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