

Influence of personal patterns of behavior on the effects of Tai Chi: a pilot study

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Abstract

Objectives To investigate the influence of individual patterns of personality and behavior on the change in mood status after a brief period of Tai Chi exercise.

Methods The mood status in 22 healthy females was evaluated before and after a period of Tai Chi exercise using the Profile of Mood States (POMS) score. Patterns of personal behavior were also assessed by written questionnaire.

Results In the type A behavior pattern group, the score for total mood disturbance decreased significantly after a brief period (20 min) of Tai Chi exercise. No change was observed in the type B behavior pattern group.

Conclusions These findings suggest that a brief period of Tai Chi exercise is mentally beneficial, particularly to individuals with type A characteristics.

Keywords Tai Chi · POMS · Patterns of behavior · Mood status · Exercise

Introduction

Tai Chi has been receiving attention worldwide as an activity that promotes physical health and mental well-being. Tai Chi is a form of mobile meditation that combines moves from ancient Chinese martial arts with breath control and relaxation [1]. It is characterized by a series of slow body movements without a break or pause and can be enjoyed irrespective of age or gender. Many studies on the effects of Tai Chi have been conducted. In the long term, Tai Chi can favorably enhance cardiorespiratory function [2, 3] and may improve physical function, such as body balance [4, 5] or gait performance [6]. Furthermore, even in the form of brief exercise, it can improve self-reported mood and relieve stress [7, 8]. To the best of our knowledge, however, there have been no studies investigating individual variation in the effects of Tai Chi. In the pilot study reported here, we examined the influence of individual patterns of personality and behavior on how mood is affected by a brief period of Tai Chi exercise.

Materials and methods

This study was intended as a preliminary evaluation for a larger intervention study. Approval for the study was obtained from the Ethics Committee of the Osaka University, following which 22 healthy female volunteers (mean age 68.9 years) belonging to a local Tai Chi class were enrolled. Written informed consent was obtained from the subjects. The subjects performed classical Yang-style Tai Chi, the most popular type, for 20 min, during which time they tried to imitate the instructor's motions and postures at the same speed and with the same technique. To evaluate their mood status quantitatively, before

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and after the exercise period, the subjects were asked to complete the 30-item Profile of Mood States (POMS) [9, 10], which is a self-rating questionnaire consisting of six mood dimensions: Tension–Anxiety (T–A), Depression–Dejection (D), Anger–Hostility (A–H), Vigor (V), Fatigue (F), and Confusion (C). The total mood disturbance (TMD) score is calculated by subtracting the V score from the sum of scores for the other dimensions. As a control, the POMS questionnaire was completed at the same time on a day that the subjects did not have a Tai Chi class. Both experimental days were separated by just 1 week (starting at 1500 hours, Tuesday), and the order of the two measurements was randomized to cancel possible sequential effects.

Prior to the experiment, the participants were asked to complete a written questionnaire designed to assess patterns of behavior by means of the Tokai University Type A Pattern Scale [11, 12]. Based on the answers, the subjects were categorized as having either type A or type B behavior patterns. Health Practice Index (HPI) [13] scores were also measured to assess lifestyle.

Student's paired *t* test was performed to compare mood status before and after Tai Chi exercise. Values were considered to be significantly different when $p < 0.05$.

Results

Table 1 shows the basic characteristics of each group. Of the 22 subjects, 14 were classified as type A. There was no significant difference in age, height, body weight, or lifestyle between the two groups.

Table 2 shows the POMS scores for all subjects during the experimental period. For the type A behavior pattern group, after Tai Chi exercise, the scores for D ($p < 0.05$), A–H ($p < 0.001$), F ($p < 0.01$), and C ($p < 0.05$) as well as TMD ($p < 0.05$) decreased significantly. There was no such change in the type B group. During the control period, there was no significant change in the POMS scores for either type A or type B individuals.

Discussion

The D, A–H, F, and C scores of the type A behavioral group showed a statistically significant decrease after Tai Chi exercise. This was reflected in a statistically significant decrease in the TMD score. These findings suggest that, particularly for individuals with type A characteristics, Tai Chi improves mood. Tai Chi is a mind–body exercise with breath control, relaxation, and meditation [1] that may, therefore, soothe impatient individuals. In contrast, for type B individuals, who are characteristically calm by nature,

Table 1 Characteristics of the subjects

Characteristics	Type A behavior pattern ($n = 14$)	Type B behavior pattern ($n = 8$)
Age (years)	69.9 ± 7.2	67.3 ± 8.6
Height (cm)	151.7 ± 5.3	152.4 ± 5.3
Body weight (kg)	51.4 ± 10.9	49.8 ± 4.7
Health Practice Index (HPI)	6.5 ± 1.1	6.6 ± 1.1
Percentage of respondents with good lifestyle		
Smoking habits	100	100
Drinking habits	92.9	100
Daily consumption of breakfast	92.9	100
Appropriate daily duration of sleep	50.0	50.0
Appropriate daily duration of work	92.9	75.0
Regular physical activity	92.9	100
Appropriate levels of subjective stress	85.7	87.5
Nutritionally balanced diet	42.9	50.0

Where applicable, values are given as the mean ± standard deviation (SD)

the mood effects of Tai Chi are less obvious. A previous study found significantly higher POMS scores for individuals with type A characteristics [14]. In our study, before the Tai Chi exercise (baseline), the POMS scores in question (D, A–H, F, and C) tended to be somewhat higher in the behavioral type A group than in the type B group, but this difference was not statistically significant. However, the lack of effect in the type B group may have resulted from a small sample size ($n = 8$). Larger populations are needed for future studies. In addition, since the intensity of Tai Chi exercise is comparable to that of brisk walking [7], these results could also be interpreted as resulting from mere physical activity. However, in a number of previous studies, POMS scores were found not to be affected by brisk walking [15–17].

We failed to find any significant change in the T–A score in the type A group following a brief period of Tai Chi exercise. This may have been due to how the Tai Chi exercise was conducted: subjects doing their best to imitate the instructor's motions and postures at the same speed and fine detail. It is possible that the tension of type A subjects persisted throughout the 20-min period of exercise. In addition, we found no significant change in V scores. In contrast, Jin studied 24 Tai Chi practitioners and reported an enhancement of vigor after 60 min of Tai Chi exercise [7]. This discrepancy in results may possibly be due to the shorter exercise period in our study. Further investigation is required to clarify this point.

Table 2 Changes in mood scores elicited before and after Tai Chi exercise

POMS	Tai Chi exercise				Control			
	Type A behavior pattern (n = 14)		Type B behavior pattern (n = 8)		Type A behavior pattern (n = 14)		Type B behavior pattern (n = 8)	
	Before	After	Before	After	Before	After	Before	After
T–A	44.4 ± 7.1	40.9 ± 4.2	41.5 ± 4.2	43.0 ± 6.5	41.9 ± 5.6	42.1 ± 4.1	42.0 ± 7.1	41.1 ± 4.0
D	45.3 ± 5.5	41.6 ± 2.1*	43.4 ± 3.7	46.0 ± 6.0	43.3 ± 4.0	44.6 ± 2.3	43.5 ± 6.0	43.6 ± 2.6
A–H	44.8 ± 5.8	38.8 ± 1.6***	42.0 ± 4.5	42.1 ± 4.1	42.1 ± 4.0	41.7 ± 1.3	43.5 ± 5.7	42.0 ± 2.8
V	48.6 ± 12.8	48.3 ± 12.4	49.4 ± 11.0	51.9 ± 10.8	55.1 ± 11.2	53.4 ± 8.8	41.9 ± 7.1	43.8 ± 9.1
F	43.7 ± 5.0	39.1 ± 2.7**	43.4 ± 3.2	42.0 ± 5.2	42.1 ± 3.6	42.1 ± 1.9	43.5 ± 5.0	43.3 ± 3.2
C	46.5 ± 7.1	42.4 ± 5.6*	43.4 ± 3.9	47.5 ± 7.5	43.9 ± 4.2	42.6 ± 3.9	43.4 ± 6.2	41.8 ± 4.3
TMD	176.1 ± 30.8	154.5 ± 9.1*	164.3 ± 18.4	168.8 ± 34.3	158.3 ± 20.5	159.6 ± 10.7	174.0 ± 26.8	168.0 ± 9.8

Values are expressed as the mean ± SD

POMS Profile of Mood States, T–A tension–anxiety, D depression–dejection, A–H anger–hostility, V vigor, F fatigue, C confusion, TMD total mood disturbance

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (Student’s paired t test): in terms of being significantly different from “before Tai Chi exercise”

In this pilot study, we found that a brief period (20 min) of Tai Chi exercise was mentally beneficial, particularly to individuals who fall into the behavioral type A category, which is associated with higher coronary risk [18]. A number of previous studies have reported that long-term Tai Chi practice can favorably enhance cardiorespiratory function [2, 3]. Taken together, these findings suggest that Tai Chi may be helpful in preventing coronary heart disease. Other previous studies have found that short- or long-term Tai Chi exercise can decrease the levels of a physiological stress marker, cortisol [7, 8, 19]. To further elucidate individual variation in the mental effects of Tai Chi and its mechanism, we are planning further investigations using a more multifaceted approach, including objective markers.

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