

EFFECTS OF TAI CHI BREATHING EXERCISE ON CARDIOVASCULAR OUTCOMES

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ABSTRACT

Purpose: The purpose of this study was to determine the effect of Tai Chi breathing exercise on blood pressure, heart rate, and respiratory rate. **Subjects:** The study participants were 30 healthy volunteer subjects ranging from 21-50 years of age. **Methods:** Subjects were randomly divided into two groups: control breathing (CB, n=15) and Tai Chi breathing (TCB, n=15). Cardiovascular outcomes including systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and respiratory rate (RR) were recorded before and after the breathing exercise. Each subject in the TCB group was instructed and given a demonstration of TCB exercise. Then they successfully performed TCB breathing exercise for fifteen minutes. The participants in the control group exhibited normal breathing for 15 minutes. Data were analyzed using paired T test. **Results:** The mean RR in CB group before and after breathing exercises was 17.53 ± 0.87 SE and 15.80 ± 1.25 SE, respectively. The mean RR in TCB group was 14.87 ± 1.28 SE and 12.00 ± 0.82 , SE, respectively. TCB breathing exercise had significantly decreased RR (P-value = 0.025). However, there were no significant changes in blood pressure and heart rate following TCB breathing exercise. **Conclusions:** This pilot study indicates that 15 minutes of Tai Chi breathing exercise has no effect on BP and HR, but TCB significantly decreases RR. **Clinical relevance:** The literature reveals that an increase in RR is associated with an increase in stress and a decrease in respiratory efficiency and endurance. Therefore, results of the investigation may suggest that TCB could be used to decrease RR, to relieve stress and to increase respiratory efficiency. Future study is recommended to determine the long-term effect of TCB on cardiovascular and stress responses, especially for patients with respiratory problems and those patients in stress induced situations.

Keywords: Breathing exercise, Tai Chi, Blood pressure, Heart rate, and Respiration rate

INTRODUCTION

In physical therapy practice, breathing exercises have commonly been utilized to treat patients with respiratory problems. This ultimately results in a decrease in the cost of oxygen consumption, increase respiratory efficiency, and increase endurance during physical activity. Jones *et al.* [1] has demonstrated that diaphragm breathing (DB), pursed-lip breathing (PLB), and a combination of DB and PLB significantly lowered oxygen cost in patients with chronic obstructive pulmonary disease (COPD). A study from Schein *et al.* [2] has shown that slow, regular breathing guided by a device called BIM (Breath with Interactive Music) significantly lowers the high blood pressure by 10 to 15 mmHg. However, little information regarding the effects of traditional breathing exercises on cardiovascular response is available. Therefore, the objective of this study was to determine the effects of TCB breathing exercises on blood pressure, heart rate, and respiration rate.

METHODS

The participants in this study were 30 healthy volunteer subjects ranging from 21-50 years of age. All subjects were screened for medical problems that would prevent their participation. The subjects with the following conditions were excluded from the study: (1) respiratory problems, (2) cardiovascular problem, (3) neurological problem, (4) metabolic syndrome, (5) subjects who are currently on medication that affect heart rate, blood pressure and mental status, (6) subjects who are pregnant, or (7)