



The Effect of Tai Chi Exercise on Stress, Anxiety, Depression, and Self Confidence of Nursing Students

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Abstract

Background: Students in medical sciences, especially nursing students, deal with many stressful factors. Stress-related psychological outcomes include anxiety, depression, and low self-confidence. Nowadays, sports exercises play a crucial role in improving lifestyle to prevent and manage stress and its consequences.

Objectives: The present study intended to investigate the effect of Tai Chi exercise on the levels of stress, anxiety, depression, and self-confidence of nursing students.

Methods: To this end, about 64 nursing students were selected and randomly divided into two 32 case and control groups in this clinical trial study. The case (experimental) group received 40-minute Tai chi training sessions three times a week for 8 weeks. Both groups completed DASS-42 questionnaire and Eysenck's Personality Questionnaire (EPQ) as a pre-test, post-test, and one-month follow-up.

Results: The results of the present study indicated that unlike the control group, the total mean score of stress, anxiety, and depression significantly decreased in the case group ($P < 0.05$), while self-confidence significantly increased in the case group during the pretest, post-test, and one-month follow-up ($P < 0.05$).

Conclusions: According to the results of the present study, it can be concluded that Tai Chi had a significant effect on reducing the stress, anxiety, and depression while enhancing the self-confidence of the intended nursing students. Furthermore, Tai Chi is recommended as a simple and inexpensive way to reduce students' stress, anxiety, and depression, whereas improves their self-confidence.

Keywords: Tai Chi Exercise, Stress, Anxiety, Depression, Self Confidence, Nursing Students

1. Background

Students play a critical role in a country's future. Every society needs a healthy physical and mental human force to progress; since students constitute a large part of the society in Iran, their health is of utmost importance (1). Mental health is the most prominent dimension of health. With the advancement of technology, mankind has been influenced by life pressures more than before; thus maintaining mental health plays an important role (2). Stress is one of the main factors threatening mental health. Stress is a multidimensional phenomenon. It is important not only from the viewpoint of economic losses but also for its negative effects on people's physical and mental health (3).

Education is a stressful experience for the students, particularly in medical sciences, dealing with human lives. Among medical students, nursing students confront with

many stressful factors due to their low levels of decision-making in their careers and their need for learning different skills. In addition to stress-induced education, nursing students are also affected by the stress caused by the clinical environment (4). Excessive stress can have a detrimental effect on the academic performance and well-being of students while interfering with efficient learning and causing mental disability and motor disorders. It can also cause alcohol and drug addiction, eating disorders, psychoactive drug abuse, suicide, sleep disturbance, mental health disorders, and psychological symptoms (5).

Psychological consequences of stress include depression and anxiety (1). As an important problem, anxiety annually affects the education of millions of students all over the world and results in their academic failure (6). The students of paramedical sciences, especially nursing students, always experience anxiety due to the stressful na-

ture of their academic field that requires practicing clinical theories. Anxiety is in an important association with learning. It affects the ability of learning, performance, training nursing students during their education, and making the right clinical decisions (7).

Depression is the most common mood disorder. It is a steady, and sometimes unstable, mood that influences all aspects of a person's life. Depression mood refers to a state of mild to severe sorrow, sadness, and irritation. Nursing students are highly exposed to the risk of depression at different levels due to changes in the place of residence, sudden separation from family, academic pressure, exam anxiety, and other stressful factors during their education. Some people of the society, including students of medical sciences and, in particular, nursing students, who are involved in protecting the physical and mental health of the people in the society are more vulnerable to such risks than other people due to the particular situation they experience in their life and career (8).

Stress, anxiety, and depression are the main factors affecting the mental health that bring some problems during one's education and cause a disturbance in taking on responsibilities (1). Research has shown that low self-confidence is one area of vulnerability to depression (9). Self-confidence is one of the important dimensions of reconciliation throughout one's life that is associated with mental health. On the other hand, reduced self-confidence causes psychological problems (10). Enhancing the self-confidence in students, as the country's future makers, is of great importance. Students of medical sciences, especially nursing students, are more at risk of lower self-confidence than others due to the psychological stresses they encounter in the hospital environment (11). Nursing students lack sufficient self-confidence due to a variety of reasons, including encouragement for obedience, unspecified job descriptions, etc. (12). Lack of self-confidence affects the creativity and motivation of nursing students (13). Considering what discussed earlier, the necessity to reduce stress, anxiety, and depression, as well as increase self-confidence among students, are seriously felt (14).

Non-pharmacological methods, known as complementary medicine, have recently received considerable attention (15). One type of complementary medicine is mind-body medicine that involves body movements with a focus on breathing and cleansing or nourishing the mind to reach a deep state of tranquility. Tai Chi is an example of such practices (16). Tai Chi is an ancient Chinese martial art whose movements are based on the harmony between mind, body, and outside forces. It includes rhythmic and relaxing movements emphasizing trunk rotation, weight change, and coordination (17). Tai Chi has three key components, including mediation, movement, and breathing

(16).

Tai Chi movements involve models derived from the movements of birds, animals, and nature such as brushing the knee, separating the horse's tail, and grasping the bird's tail, etc. so as to enhancing health, breathing, strength, and endurance (18). This set of relaxing, rhythmic, and fluid movements brings about a state of mental health and calm by fostering the body and mind as a coherent unit as well as evacuating the mind from thoughts that cause tension (19). Zheng et al. (20) found that Tai Chi can enhance the physical and mental health of the students. In another study on senior students, Webster et al. (21) found that Tai Chi had a great impact on the physical and mental health.

2. Objectives

In general, owing to the significant key role of nursing students in maintaining the physical and mental health of the society, and given that Tai Chi Chuan is a safe and cost-effective intervention without requiring any special facilities, additionally, with respect to the fact that no study has been done yet on the effect of Tai Chi on stress, anxiety, depression, and self-confidence of nursing students in Iran, the present study intended to investigate the effect of Tai Chi exercise on stress, anxiety, depression, and self-confidence of nursing students.

3. Methods

The present study is a two-group and three-step clinical trial. The study was conducted in the Faculty of Nursing and Midwifery of Isfahan. The intended subjects (participants) were selected based on the objective-oriented convenience sampling method and were randomly divided into two case and control groups based on simple random assignment of odd and even card numbers. About 64 nursing students who met the inclusion criteria were randomly assigned to the two groups of the case (32 subjects) and control (32 subjects). The inclusion criteria were the lack of a history of heart, muscular, and mental problems as well as lack of a long-term experience in Tai Chi. Data were collected using DASS-42 (Depression, Anxiety, and Stress Scale-42) questionnaire consisting of two sections: one on personal information and the other on the extent of depression, anxiety, and stress.

3.1. First Section

It assessed the personal information of the selected subjects, including 7 items about age, sex, marital status, family structure, semester of education, income, and status of residence.

3.2. Second Section

It assessed the scale of depression, anxiety, and stress. DASS-42 is a 42-item self-report inventory developed by Lovibond (1995) for measuring the emotional states of depression, anxiety, and stress based on a Likert scale. DASS-42 is made up of 14 items for depression, 14 for anxiety, and 14 for stress being rated from 0 to 30. Lovibond performed this scale on a non-clinical sample of 2914 individuals in order to evaluate its psychometric properties. The reliability of the sub-scales of depression, anxiety, and stress was estimated at an acceptable level of %91, %94 and %84 based on Cronbach Alpha, respectively. These indices were consistent with what was found in the clinical population (22).

Eysenck personality questionnaire (EPQ) was also used to assess self-confidence. EPQ, developed by Hans Eysenck (1977), consists of 30 items, each contains "Yes", "No" and "?" options. The reliability and validity of EPQ were estimated in various foreign and Iranian studies (9). Sampling was performed along with providing the subjects with necessary explanations about the purpose and methods of the research to reach informed consent. The intervention was conducted in the form of 40-minute training and implementation sessions of the preliminary short forms of Yang's Tai Chi exercise three times a week for 8 weeks. Moreover, the Tai Chi tutorial CD was presented to the case group to remind working out at home. The control group received their normal semester of education during the Tai Chi intervention period. Data were collected in three steps of pre-intervention, post-intervention, and a one-month follow-up. Ethical considerations were comprised of presenting a letter of introduction, obtaining permission from the school of nursing, providing sufficient information about the purpose of the present study, and ensuring the confidentiality of the participants' personal information. Data were analyzed based on the tests of independent *t*-test, chi-square, Mann-Whitney, Fisher's exact, post hoc test, and repeated measures ANOVA using SPSS18 software.

3.3. Ethical Considerations

The Ethics Committee of Isfahan University of Medical Sciences approved the study (No. 395957) and the study was registered in IRCT (IRCT20171210037824N1). Formal authorization was obtained from the College of Nursing and Midwifery of Isfahan University of Medical Sciences for both the sampling and the study. The purpose and method of the research were described to the participants and written informed consent was obtained from all subjects to participate in the study.

4. Results

The participants of the present study included 64 nursing students selected from Isfahan University of Medical Sciences with a mean age of 21.50 years. The results of chi-square test showed that there was no statistically significant difference in the distribution frequency of the participants' sex, marital status, and current status of residence of both case and control groups ($P > 0.05$). According to Fisher's exact test, the frequency distribution of family structure was not significantly different between both groups ($P > 0.05$). The results of Mann-Whitney U test showed that there was no significant difference in the participants' income and semester of education between the case and control groups ($P > 0.05$). According to the results of *t*-test, the mean score of depression, anxiety, stress and self-confidence was not significantly different between both groups in the pre-intervention stage (Table 1), while the mean score of depression, anxiety, and stress was significantly lower in the case than the control group in the post-intervention stage (Table 1). Moreover, the mean score of self-confidence was significantly higher in the case group than in the control groups (Table 1). The results of *t*-test in the one-month follow-up indicated that the mean score of depression, anxiety, and stress of the case group was significantly lower than the control group (Table 1). However, the mean score of the self-confidence was significantly higher in the case than the control group in the one-month follow-up stage (Table 1).

The results of ANOVA with repeated observations showed that there was no significant difference between the mean depression scores of the control group in all the three test stages ($P > 0.05$), while significantly different for the case group ($P < 0.05$). According to LSD post hoc test, the mean depression scores of the case group were significantly lower in the post-test ($P = 0.02$) and one-month follow-up ($P = 0.002$) stages than the pre-test stage; however, there was no statistically significant difference between the mean depression scores of the post-test and one-month follow-up ($P = 0.23$).

The results of repeated measures ANOVA showed that there was not any significant difference between the mean anxiety scores of the control group in all the three test stages ($P > 0.05$) while significantly different for the case group ($P < 0.05$). According to LSD post hoc test, the mean anxiety scores of the case group was significantly lower in the post-intervention ($P = 0.005$) and one-month follow-up ($P = 0.001$) stages than the pre-intervention stage; however, there was not any statistically significant difference between the mean anxiety scores of the post-intervention and one-month follow-up ($P = 0.45$).

The results of ANOVA with repeated observations

Table 1. Mean Score and SD of Depression, Anxiety, Stress, and Self-Confidence in Different Test Stages

	Case Group, Mean \pm SD	Control Group, Mean \pm SD	Independent T-Test	
			T	P Value
Score of pre-intervention				
Depression	13.17 \pm 8.38	12.14 \pm 5.10	0.59	0.56
Anxiety	11.25 \pm 7	10.18 \pm 6.46	0.62	0.53
Stress	13.91 \pm 6.76	14.53 \pm 6.51	0.37	0.71
Self-confidence	12.06 \pm 5.94	13.26 \pm 5.52	0.82	0.42
Score of post-intervention				
Depression	9.09 \pm 6.85	13.08 \pm 6.78	2.31	0.02
Anxiety	6.31 \pm 5.14	10.29 \pm 6.97	2.56	0.01
Stress	9.10 \pm 6.05	14.28 \pm 8.53	2.75	0.008
Self-confidence	20.32 \pm 5.87	14.71 \pm 4.42	4.25	< 0.001
Score of one-month follow-up				
Depression	7.20 \pm 5.46	12.21 \pm 7.95	2.89	0.005
Anxiety	5.42 \pm 4.41	10.20 \pm 6.51	3.38	0.001
Stress	7.28 \pm 5.80	13.45 \pm 5.91	4.15	< 0.001
Self-confidence	21.42 \pm 4.30	14.68 \pm 6.72	4.71	< 0.001

showed that there was not any significant difference between the mean stress scores of the control group in all the three test stages ($P > 0.05$) while significantly different for the case group ($P < 0.05$). According to LSD post hoc test, the mean stress scores of the case group was significantly lower in the post-intervention ($P = 0.008$) and one-month follow-up ($P = 0.001$) stages than the pre-intervention stage; however, there was not any statistically significant difference between the mean stress scores of the post-intervention and one-month follow-up ($P = 0.15$).

The results of repeated measures ANOVA showed that there was no significant difference between the mean self-confidence scores of the control group in all the three test stages ($P > 0.05$), while there was a significant difference in the case group ($P < 0.05$). According to LSD post hoc test, the mean self-confidence scores of the case group was significantly higher in the post-test and one-month follow-up stages than the pre-test stage ($P < 0.001$); however, there was not any statistically significant difference between the mean self-confidence scores of the post-test and one-month follow-up ($P = 0.41$).

5. Discussion

The present clinical trial study aimed to investigate the effect of Tai Chi on the stress, anxiety, depression, and self-confidence of 64 nursing students of the school of nursing at Isfahan University of Medical Sciences.

The results of the present study showed that the mean scores of stress, anxiety, depression, and self-confidence were not significantly different in the pre-intervention stage between the case and control groups, while significantly decreased in the case group after Tai Chi exercises in the post-intervention stage. However, there was no significant difference in the mean scores of the control group. It can, hence, be claimed that Tai Chi had an impact on stress, anxiety, depression, and self-confidence. Other studies have also investigated the effect of Tai Chi on improving the psychological symptoms such as stress, anxiety, and depression (23). The majority of such studies have been conducted to examine the effect of Tai Chi on patients with chronic diseases or on the elderly population. Others have studied the relationship between Tai Chi and the physical and mental health of students or younger population. Wang et al. (24) studied the effect of Tai Chi on the physical and mental health of students. They gave 24 models of Tai Chi training exercises to the students twice a week for 3 months. They found that Tai Chi has a positive effect on the students' physical and mental health (24). Lee et al. (23) aimed to investigate the effect of Tai Chi on improving the psychological well-being of elderly people. The population included healthy elderly (mean age: $n = 72$) who were given 1-hour Tai Chi training session twice a week for 24 weeks. The results indicated decreased stress (23).

Tsai et al. (25) studied the positive effects of Tai Chi on the blood pressure, cholesterol, and anxiety of 78 healthy

people. The participants received 50-minute Tai Chi sessions three times a week for 12 weeks. The results indicated positive effects of Tai Chi on improving anxiety levels in the case group compared to the control group (25). Wang (26) studied the effect of Tai Chi on pain relief and performance improvement in patients with rheumatoid arthritis. To this end, 20 patients received Tai Chi exercises twice a week for 12 weeks. The results showed a decrease in the symptoms of depression and anxiety in the case group in comparison to the control group (26). Sattin et al.'s (27) study on Tai Chi showed that Tai Chi significantly reduced depression. Moreover, Han et al. (28) found that Tai Chi significantly reduced the symptoms of anxiety and depression. Mustian et al. (29) found that Tai Chi increased the self-confidence of the participants. Fransen et al. (30) found that Tai Chi did not have any positive effect on reducing stress, anxiety, and depression.

The results of the present study have also shown that the mean scores of stress, anxiety, depression, and self-confidence were not significantly different between the case and control group in the one-month follow-up stage. Maleki et al. (14) studied the effect of schema therapy on reducing symptoms of anxiety and depression disorders in nursing and midwifery students. It was a case-control study in three stages of pre-test, post-test and a two-month follow-up. The results showed that the symptoms of anxiety and depression decreased in the post-test and two-month follow-up stages ($P < 0.05$). Maleki et al.'s (14) findings were in line with the results of the present study in terms of the reduction of anxiety and depression in nursing students. In this study, there was not any significant difference in the mean scores of stress, anxiety, depression, and self-confidence between the case and control groups in the post-intervention and one-month follow-up. Zheng et al. studied the effect of Tai Chi on enhancing the physical and mental well-being of medical students in Fujian, China. Zheng et al.'s study had similar inclusion criteria and age group to the present study. In Zheng et al.'s study, the case group received 24 simple models of Tai Chi Chuan 5 times a week for 12 weeks, whereas the control group received no specific exercises. Once the 12-week intervention was accomplished, the follow-up stage started. The results of the Zheng et al.'s study indicated the significant effect of Tai Chi on the ability to maintain balance, flexibility, self-confidence, fitness, self-sufficiency, psychological symptoms, concentration, stress, quality of life, and quality of sleep at the end of the intervention. However, Tai Chi did not have any significant effect on the cardiovascular function, blood pressure, self-esteem, mood, happiness, quality of life and quality of sleep in the case group during the follow-up stage (20).

The strength of the current study is addressing an im-

portant intervention i.e. Tai Chi, for decreasing depression, anxiety, and stress while increasing the self-confidence of academic students. However, further study is recommended to evaluate other samples and populations. The limitations of this study included the small sample size, thereby limiting the generalized applicability of the results. Therefore, the findings of this study should be reassessed after similar studies have been replicated in other contexts.

5.1. Conclusions

The results of the present study indicated that Tai Chi reduced nursing students' stress, anxiety, and depression while improving their self-confidence in the post-test and one-month follow-up. Consequently, it can be stated that Tai Chi is an effective way to improve the psychometric symptoms of students in the university.

Footnotes

Authors' Contribution: Saedeh Kabiri Dinani and Tayebeh Mehrabi collected the data and prepared the article, Reza Sadeghi corporate in doing intervention.

Clinical Trial Registration Code: IRCT20171210037824N1.

Conflict of Interests: The authors declare they have no conflict of interest.

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Patient Consent: The purpose and method of the research were described for the participants, and written informed consent to participate in the study was received from all of them.

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