11-14-2014

Tai Chi and Stress Reduction in Premedical Students

Joseph G. Weber
Lake Erie College

Suzanne Coleman
A.T. Still University

Mark Johannsson
A.T. Still University

Libby Hill
Family Karate

Tai Chi and Stress Reduction in Premedical Students

Joseph G. Weber, DHSc, MBA, MPAS, PA-C, Associate Professor, Director Physician Assistant Studies, Lake Erie College;
Suzanne Coleman, DHSc, RNC-OB, CRCP, *A.T. Still University; Mark Johannsson, DHSc, A.T. Still University; Libby Hill, B.S., Family Karate*

ABSTRACT

Anxiety and depression are well-documented conditions in medical students with 28.7% of medical students showing signs of anxiety versus a U.S. national average of 18%.[1] Few studies however have investigated whether Tai Chi (TC) would lower anxiety levels in medical students.[2] **PURPOSE:** To complete a pilot randomized control trial to determine if TC exercise could reduce anxiety in undergraduate premedical students. **METHODS:** The sample (*N*=14) was recruited from 70 premedical students enrolled at Lake Erie College located in Ohio. Participants included: (a) full-time LEC premedical students; (b) between 18 years and 25 years old; and (c) a resident of either on-campus housing or within two miles of the college campus. Participants were randomly assigned to: (a) TC (*n*=8); or (b) control (*n*=6). The TC group received instruction from a certified instructor, twice a week for five weeks. The control received no training. Both groups completed a basic health history questionnaire including blood pressure and pulse measurements, maintained a physical activity log, and completed a pre/post measure of anxiety using the Beck Anxiety Inventory (BAI)©. Descriptive statistics including mean and standard deviation were calculated for demographic variables. Relationships between variables were also explored using paired samples two-tailed *t*-tests and chi-square χ^2 with the alpha (α) level set at 0.05. **RESULTS:** The *p*-value of .334 between pre-study control and TC groups was greater than the alpha level at 0.05. The *p*-value of .101 between post-study control and TC groups was greater than the alpha level at 0.05. **CONCLUSIONS:** The small sample size of this pilot limited the results of this study. Therefore, there was insufficient evidence to conclude TC lowered anxiety in premedical students.

BACKGROUND

- Anxiety and depression are well-documented conditions in medical students[1]
- 28.7% of medical students show signs of anxiety versus a U.S. national average of 18%[1]
- Anxiety levels are generally higher in third-year medical students[3]
- TC exercise improves mood, increases energy, improves happiness, and decreases cortisol[4]
- TC has been shown to significantly lower anxiety levels in individuals[4,5]

PURPOSE

- Complete a pilot randomized control trial to determine if TC exercise could reduce anxiety in undergraduate premedical students

METHODS

- Participants were randomly assigned to one of two groups: (a) TC (*n*=8); or (b) control (*n*=6).
- The TC group received instruction twice a week for five weeks. The control received no training.
- Both groups completed a basic health history questionnaire including blood pressure and pulse measurements, maintained a physical activity log, and completed a pre/post anxiety measures using Beck Anxiety Inventory (BAI)© scale.
- A statistical analysis of data was performed using IBM© SPSS© Statistics package version 21.

Sample Demographics and Characteristics

Variable	*N* = 14	Control *n* = 6	TC *n* = 8	*p* value
Age (years)	20.79 ± 1.63	20.00 ± 1.09	21.28 ± 1.77	0.12 [a]
Gender - Male	4 (28.6%)	1 (16.7%)	3 (37.5%)	0.58 [b]
Gender - Female	10 (71.4%)	5 (83.3%)	8 (62.5%)	0.58 [b]

Blood Pressure

Variable	Control *n* = 4	TC *n* = 7
Systolic BP Pre-Study	114.00 ± 4.169	111.71 ± 8.180
Systolic BP Post-Study	112 ± 11.091	98.57 ± 17.539
Diastolic BP Pre-Study	76.50 ± 2.646	75.00 ± 6.028
Diastolic BP Post-Study	72.25 ± 10.533	70.29 ± 15.030

Note. Data presented as mean ± SD or # (percentage).

BAI Analysis

Variable	Control *n* = 4	TC *n* = 7	*p* value	95% CI
BAI Pre-study total	10.75 ± 8.38	8.71 ± 6.73	0.334 [a]	[-8.343, 12.414]
BAI Post-study total	11.50 ± 3.87	6.00 ± 7.30	0.101 [a]	[-3.530, 14.430]

Note. Data presented as mean ± SD or # (percentage). BAI = Beck Anxiety Inventory. TC = Tai Chi [a] Independent-samples *t*-test one-tailed.

METHODS (cont.)

- Descriptive statistics including mean and standard deviation were calculated for demographic variables including age, general health, smoking history, prior experience with TC, and illness history.
- Relationships between variables were explored using paired samples two-tailed *t*-tests and chi-square (χ^2) with the alpha (α) level set at 0.05

RESULTS

- Ages ranged from 18 to 25 years old with a median age of 21
- 4 students (28.6%) were male and 10 students (71.4%) were female
- 3 participants (21.4%) reported a personal history of anxiety disorder
- No statistical significant difference found between pre/post study in BP, pulse, or anxiety scores

DISCUSSION

- The 21.4% dropout rate compared favorably to results of prior studies ranging from 12.5% to 25.5%[2]
- The small sample size limited the results of this study
- The literature demonstrated the anxiolytic effects of Tai Chi in many subjects; it is not clear if premedical or medical students would obtain the same effects
- Study did not provide evidence of anxiety-lowering effects of Tai Chi exercise in premedical students

CONCLUSIONS

- There was insufficient evidence to conclude TC lowered anxiety in premedical students.

REFERENCES

1. Ahmed, I., Banu, H., Al-Fageer, R., & Al-Suwaidi, R. (2009). Cognitive emotions: Depression and anxiety in medical students and staff. *Journal of Critical Care*, *24*(3), e1-e7. http://dx.doi.org/10.1016/j.jcrc.2009.06.003
2. Wang, C., Bannuru, R., Ramel, J., Kupelnick, B., Scott, T., & Schmid, C. H. (2010). Tai Chi on psychological well-being: Systematic review and meta-analysis. *BMC Complementary And Alternative Medicine*, *10*(1), 23. http://dx.doi.org/10.1186/1472-6882-10-2
3. Chandavarkar, U., Azzam, A., & Mathews, C. A. (2007). Anxiety symptoms and perceived performance in medical students. *Depression & Anxiety*, *24*(2), 103-111. http://dx.doi.org/10.1002/da.20185
4. Field, T. (2011). Tai Chi research review. *Complementary Therapies in Clinical Practice*, *17*(3), 141-146. http://dx.doi.org/10.1016/j.ctcp.2010.10.002
5. Kalsaria, P., Li, H., Waite, G. N., Moga, M. M., Kingsley, D. J., & Geib, R. W. (2012). Acute effects of tai chi exercise on cardiac autonomic function in healthy adults with tai chi experience. *Biomedical Sciences Instrumentation 48*(1), 226-31. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22846287