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The Effects of Regular Yoga Practice on Psychophysiological Measures in College Students

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ABSTRACT

PURPOSE: The purpose of this study was to test the hypothesis that 12 weeks of a regular yoga practice (150 minutes/week) would improve measures of cardiovascular and psychological health in college students. **METHODS:** Twenty-two college students (21±1.2 yrs; 21 female) participated in this study. Height, weight, waist/hip circumference, resting blood pressure and heart rate, fasting blood glucose and cholesterol, and psychological health (STAI form Y-1 and Y-2) were assessed prior to the end of the third week of the semester (PRE). Subjects participated in their Yoga I class throughout Fall semester. After the 12th week of class, participants reported to the laboratory for follow up testing (POST). **RESULTS:** A significant improvement in trait anxiety (Y-2), assessing participants' disposition to develop anxiety as a part of their personality, was shown after 12 weeks of a regular yoga program (PRE: 39±2 vs POST: 34±1.8; p=0.002). There was no change in state anxiety (Y-1), assessing participants' levels of anxiety "in the moment" (PRE: 34±1.7 vs POST: 33±1.9; p=0.96). There was also no change in weight, waist/hip circumference, resting heart rate, resting blood pressure, fasting blood glucose, or cholesterol measurements from PRE to POST testing. **CONCLUSION:** 12 weeks of regular attendance to a beginner yoga program improved measures of (personality) trait-anxiety in college students.

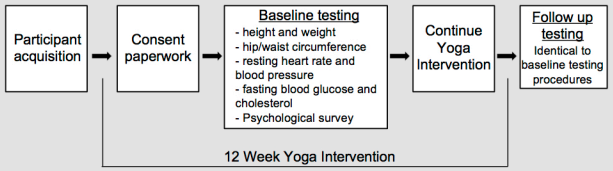
BACKGROUND

- College aged students are at an increased risk of mental health issues (1).
- Ashtanga yoga is a commonly practiced form of yoga that teaches individuals how to control fluctuation in their mental state (2).
- Research suggests yoga as a useful intervention to reduce stress, depression and chronic pain while also improving sleep patterns, overall well-being and quality of life (3).
- Yoga has also been shown to have beneficial effects on blood pressure (4), blood cholesterol (5), and blood glucose (6).
- The aim of this study is to investigate the effects of 12 weeks of regular Ashtanga yoga practice on resting blood pressure, heart rate, blood glucose, serum cholesterol, and psychological health.
- It was hypothesized that 12 weeks of a regular Ashtanga yoga practice would have beneficial effects on both physiological and psychological measurements in current college aged students.

METHODS

- Twenty-two college aged students participated in this study. Prior to participation, a health history form and an informed consent were completed.
- Participants completed baseline testing (PRE) consisting of weight, hip and waist circumference, resting heart rate, resting blood pressure, fasting blood glucose and fasting blood cholesterol measurements as well as a psychological survey and a physical activity questionnaire.
- The State-Trait Anxiety Inventory for Adults: Self-Evaluation Questionnaire (STAI) was used to measure psychological health. STAI form Y-1 assessed how the participant felt in the moment (state anxiety) and STAI form Y-2 assessed how the participant generally felt (trait anxiety).

Figure 1. Protocol Schematic



- Participants attended at least 80% of their regularly scheduled Ashtanga yoga classes (approximately 150 minutes/week) over a period of 12 weeks.
- Participants completed follow up testing (POST) after completion of the 12th week of yoga class. Follow up testing procedures were identical to baseline testing procedures.
- Paired Student's t-tests were used to analyze the data.
- Where normality was not met via Wilks Shapiro test, a Wilcoxon Signed Rank test was performed.

RESULTS

Table 1. Participant Demographics.

Characteristic	Mean ± SD
N	22
Sex	21F/1M
Age (yrs)	21±1.2*
Height (inches)	66±2.7*

Table 2. Participant Characteristics.

Characteristic	Baseline (Mean ± SEM)	Follow Up (Mean ± SEM)
Weight (kilograms)	65±1.9	65±1.8
Hip circumference (cm)	97±1.8	97±1.7
Waist circumference (cm)	78±1.8	77±1.8
Resting heart rate (bpm)	67±2.4	66±1.7
Systolic blood pressure (mmHg)	109±2.2	107±2.2
Diastolic blood pressure (mmHg)	67±1.9	64±1.7
Total cholesterol (mg/dL)	176±12	172±9.3
Blood glucose (mg/dL)	90±1.8	90±2

bpm, beats per minute; mmHg, millimeters of mercury; mg/dL, milligrams per deciliter; SEM, standard error of the mean.

Figure 2. No change in State Anxiety after 12 weeks of Ashtanga Yoga

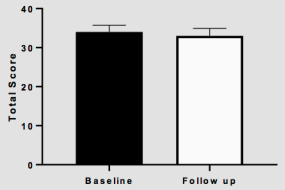


Figure 2. A significant decrease in state (in the moment) anxiety scores was not observed from baseline to follow up testing ($p > 0.05$). STAI Y-1 scoring guidelines were used to determine the total score. At baseline testing, the average score was 34 ± 1.7. At follow up testing, the average score was 33 ± 1.9.

Figure 3. Trait Anxiety is improved after 12 weeks of Ashtanga Yoga

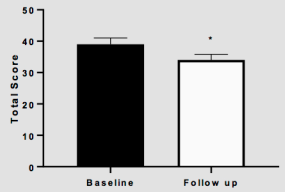


Figure 3. A significant decrease in trait (overall/general) anxiety scores was observed from baseline to follow up testing. STAI Y-2 scoring guidelines were used to determine the total score. The average score at baseline testing was 39 ± 2 and the average score at follow up testing was 34 ± 1.8. *$p<0.05$ compared to baseline.

CONCLUSION

- These data suggest that 12 weeks of a regular Ashtanga yoga can improve measures of overall anxiety in college-aged students.
- As there is an increased risk of mental health issues associated with this age group, use of a regular yoga program may be helpful to reduce long-term stress and anxiety in college students.

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