

Yoga and Academic Achievement: A Preliminary Study in a Miami High School

Abstract: The last decade has seen a dramatic increase in the number of practitioners of yoga in the United States, with subjective experiences as well as research studies suggesting that practitioners experience stress reduction as a result of regular yoga practice. In the meantime, it is widely accepted that a high level of stress is a major contributor to poor work and academic performance. This study presents the results of a preliminary exploration of the effects of yoga on the stress levels of 19 high school sophomores who are preparing for the Florida Comprehensive Assessment Test. Students took part in a 40-minute astanga yoga workshop, then responded to a first post-survey immediately after the workshop, and a second post-survey two weeks later. The students reported a marked decrease in their stress levels in both surveys, indicating that they had retained several of the techniques presented in the workshop and used them to decrease their stress level, especially before taking exams. These findings suggest a tentative positive correlation between yoga practice and academic achievement, and point to the need for further research and study on the subject.

Introduction

In 2008, the Harris Interactive Service Bureau surveyed 5,050 respondents – a statistically representative sample of the total U.S. population – on behalf of *Yoga Journal*, the largest yoga-related magazine in the country. The results of the study indicated that 6.9% of U.S. adults, or 15.8 million people, practice yoga, with another nearly 8%, or 18.3 million Americans, reporting that they are very or extremely interested in yoga. The study also collected data on the demography of practitioners, revealing that the youngest age group to collectively practice yoga is the 18-34 age group, which consists of 40.6% of yoga practitioners, and that 44% of yoga practitioners have household incomes of \$75,000 or more.¹ Noticeable in this data is the absence – or at least dearth – of yoga practitioners who are below 18 years of age, as well as the paucity of practitioners from lower-income backgrounds.

The practitioners of yoga in the above survey cited such reasons as gaining strength and flexibility, and decreasing stress, as primary reasons for their practice. Other studies have pointed to the benefits of yoga in alleviating stress, which can be best defined as “an imbalance between

real or perceived environmental demands and one's ability or perceived ability to cope with these demands."² One study on the "Psychological Aspects of Asthma" concluded that modalities such as yoga can have a central role in decreasing stress (a trigger for asthma symptoms),³ while another on the "Effects of Two Yoga Based Relaxation Techniques on Heart Rate Variability (HRV)" reported an increase in heart rate during the more active part of a yoga practice, and a decrease during the final relaxation that usually takes place at the end of a yoga class.⁴ Studies on psycho-neuro-immunology (the study of the effects of emotional factors on disease susceptibility and disease resistance), a field that came to fruition in the 1980s and 1990s, point to the effectiveness of general mindfulness-based stress reduction and relaxation programs, such as in one case on the stress, state anxiety, mental adjustment, and health locus of control in 27 women with diagnosed breast cancer.⁵

Despite the recent studies on the effects of yoga on stress as it affects physical health, there has been hardly any research undertaken on the effects of yoga on stress as it affects academic performance. In his article on Phoenix Rising Yoga Therapy, Michael Lee points to the yoga sutras' "directions for understanding life more fully and... techniques, including the use of the body and the breath and meditation, for attaining deeper wisdom;"⁶ such wisdom can surely be seen to incorporate educational performance. The effects of yoga on the academic performance of K-12 and college students, two groups who suffer from a great deal of academic pressure and experience high levels of stress, have barely been examined by researchers, however. The first more thorough study that examined the effects of a mind-body therapy – meditation – on memory, attention, reading skills, and intelligence focused on a very general adult population, and is dated, brief, and inconclusive in its results.⁷ Wheeler and Wilkin's 2007

study on the impact of yoga on the perceived stress, heart rate, and breathing rate on 79 “moderately-stressed” students enrolled in a Yoga Asana class in a Southern California university demonstrated the positive association of yoga asanas with pre- to post-class changes on perceived stress, heart rate, and breathing rate, but did not examine these changes in light of academic achievement.⁸ Wilson, Marchesiello and Khalsa’s 2008 study on perceived benefits of Kripalu yoga classes in diverse and underserved populations incorporated subjects from 6 centers for youths ages 13-18, but the focus of the article was not on the perceived effects of yoga from the perspective of academic achievement.⁹

Perhaps the most in-depth exploration of the effects of yoga on the stress experienced by a segment of the K-12 group was carried out by Michael Brooks. In his 2007 chapter “Yoga as an Anxiety Reducing Technique with Elementary Students,” Brooks begins by presenting an overview of previous research on stress in children. Explaining that “academic concerns, family interpersonal problems, and peer relationship troubles identify just a few of the everyday kinds of issues children experience,” he cites a previous study by Hunter and Barker that found that “school related stress, the most prevalent untreated cause of academic failure, is believed to afflict an alarming 6 to 10 million children a year.” Although previous studies have pointed to how “the practice of yoga has been shown to reduce middle school children’s state anxiety, heart rate, headaches, general tension, and stress symptoms,” Brooks in general notes the “dearth of current systematic studies... (on) the effectiveness of yoga on various aspects of students’ functioning.”¹⁰ Brooks’s own study looked at the effects of yoga on the anxiety levels of fifteen fourth and fifth graders in a white, upper middle-class school. Students took the State-Trait Anxiety Inventory before and after partaking in a 6-week yoga class that met three times per

week, for 20 minutes each session. While there was no statistically significant change (other than for two of the participants) in trait anxiety scores pre-test to post-test, teachers reported that after the class, students' reaction time to instructional requests was noticeably reduced, and students were seen to be more engaged in their learning (e.g. they were more willing to answer questions, accept constructive criticism, and even be tardy less frequently). Furthermore, Brooks points to a flaw in the research design that led to the pre-test being administered after an early yoga session rather than before any yoga sessions having taken place. In his discussion of directions for further research, Brooks suggests, among other ideas, incorporating outcome measures related to classroom performance and academic achievement.

This article presents preliminary findings of the effects of a yoga workshop on 19 high school sophomores, in a low-achieving, inner-city school in Miami, Florida, a city that consistently ranks among the top five high-crime rate metropolises in the U.S. This student body is in considerable contrast to the subjects of Brooks's study. Students in this study were exposed to a 40-minute yoga session, aimed at helping them to manage stress in order to enable them to attain better results on their examinations, especially the standardized Florida Comprehensive Aptitude Test (FCAT). Immediately after the session, students filled out a post-survey about their experience and perceptions of their stress levels; they completed a second post-survey two weeks later.

Background

The yoga session in which the above-mentioned students participated was part of the "Chill Out!" Program organized by Do The Right Thing, a non-profit organization supported, in

part, by forfeiture funds donated by the Miami Police Department, as well as by private donations from corporations, foundations and philanthropists around the community. Among the goals of Do The Right Thing are the reinforcement of socially desirable behavior among young people, and the fostering of positive relations between the police department and youths. The organization provides an array of activities to help underprivileged children in the community, such as anti-violence youth rallies and picnics, leadership seminars, and crime prevention contests.¹¹

Recognizing the role of stress in students' lives, reportedly derived "from learning to deal with the pressures of school performance and peers to time-consuming extracurricular and FCATs," the Do The Right Thing Program "developed the 'Chill Out!' Stress Management Series in an effort to bring health, wellness and stress-free living into the lives of Miami-Dade students who are preparing for the FCATs."¹² First implemented as a pilot program in April 2007 for students preparing for AP testing in one Miami-area high school, "Chill Out!" was so well-received that in 2008 and 2009 Do The Right Thing expanded the program to three schools: one elementary, one junior high, and one high school. In all three schools, students were preparing to take the Florida Comprehensive Assessment Test (FCAT), a standardized test administered to students in Grades 3-11 that measures student progress toward meeting the Sunshine State Standards (SSS) benchmarks.

During the "Chill Out!" students rotated between sessions on nutrition, yoga and test taking strategies, followed by healthy lunches and visits from top officials from the Miami Police Department. In 2008, when "(a)ll students were surveyed on how they liked the seminar...the yoga sessions inspired the most positive responses as students learned breathing, stretching and

relaxation techniques.”¹³ This anecdotal testimonial prompted the researchers to conduct two post-surveys of the workshop and its benefits – one immediately after and one two weeks after the January 2009 event – in order to determine further its effects on the students’ perceived stress levels, as well as on students’ perceptions of how the workshop may affect their future test-taking strategies and hence academic achievement.

Methodology

As the yoga workshop was brief and part of a complex, fast-paced workshop series, concise surveys were given only to the high school students who participated in the “Chill Out!” Program. These 19 students participated in a 40-minute yoga workshop that focused on breathing techniques, as well as on the standing postures of the astanga primary series. This dynamic style of yoga, transmitted by Sri K. Pattabhi Jois, involves synchronizing the breath with a progressive series of postures that produces intense internal heat. All of the high school participants were sophomores, a grade level whose students were chosen for “Chill Out!” because of their approaching FCAT exams. Of these students, 9 were female, and 10 were male. Six of them reported having been “somewhat familiar” with yoga before the workshop, but none of them had practiced it previously.

Summary of the first post-survey

Immediately after finishing the workshop, the students completed their first post-survey. Due to the lack of computer availability at that moment, the test was completed using paper and

pencil, rather than electronically. The first post-survey consisted of 17 questions, eight of which were open-ended, and nine of which were closed-ended. The first of the closed-ended questions were regarding participants' sex, grade level, familiarity with yoga prior to the workshop, and their rating of the quality of the workshop and the presentation. Most of the open-ended questions asked students about what they enjoyed about the workshop, and what improvements they felt could be made.

This study focuses on four particular questions in the survey, three of which are closed-ended, and one of which is open-ended. The closed-ended questions specifically addressed participants' perceptions of the effects of the yoga session on their stress levels and on the stress levels affecting their academic performance on the upcoming FCAT, and the level of difficulty that they experienced in focusing on the breath (the researchers did not wish to ask about level of difficulty experienced in performing particular postures in order to avoid giving an impression that doing yoga "right" meant performing asanas in a specific "pretzel-like" manner). The open-ended question asked participants about the benefits of the yoga session.

Results of the pertinent four questions were as follows:

Survey Question #5: How helpful was the workshop for your current stress level?

Very helpful 7

Helpful 9

Somewhat helpful 2

Neutral 1

Not helpful at all 0

Total respondents 19

Survey Question #6: How helpful do you feel this workshop will be for managing stress before taking the Florida Comprehensive Aptitude Test (FCAT)?

Very helpful 4

Helpful 12

Somewhat helpful 1

Neutral 1

Not helpful at all 0

No response 1

Total respondents 19

Survey Question #10: How difficult was it to focus on the breath?

Very Difficult 1

Somewhat Difficult 4

Neutral 10

Not Difficult at All 4

Total respondents 19

The final open-ended question, which was also the final question on the survey (#17), asked students “What was the most important piece of information that you learned from the workshop that will have a positive impact on your life as a student?”

Responses were as follows:

- See the light in others as well as myself
- New exercises I can use
- Yoga helps stress
- To focus and relax
- The breathing
- To be calm
- It's very good to exercise
- Do yoga
- Don't know (3 responses)
- How to relieve stress
- Take a deep breath when I stress up
- Positive attitude and staying calm
- A positive attitude about life
- To be more kind to people
- Positive attitude, focus more, and relax
- Yoga!

A discussion of these results is given below.

Summary of the second post-survey

The second post-survey was administered two weeks after the “Chill Out!” event. 14 students, all of whom had participated in the workshop, took the test, which was computer-administered, and consisted of closed-ended questions only. The test asked about the students’ general health habits, stress habits, social habits, and academic habits. The last four questions of the survey dealt with the yoga workshop specifically. Questions focused on a particular element several times to aid with the reliability of the instrument. Results were as follows:

Survey Question #16: How much do you agree with the statement, “Since taking yoga class, I have practiced the breathing techniques that were taught at least once?”

Strongly Disagree 4

Disagree 0

Neutral 2

Agree 5

Strongly Agree 3

Total respondents 14

Survey Question #17: How much do you agree with the statement, “Since taking yoga class, I am more aware of my posture?”

Strongly Disagree 2

Disagree 2

Neutral 2

Agree 4

Strongly Agree 4

Total respondents 14

Survey Question # 18: How much do you agree with the statement, “I have used the breathing techniques that I learned from yoga before taking a test and it helped me to relax?”

Strongly Disagree 2

Disagree 3

Neutral 2

Agree 5

Strongly Agree 2

Total respondents 14

Survey Question # 19: How much do you think the yoga class added to your learning experience in the “Chill Out!” program?

None 2

Very little 0

Average 5

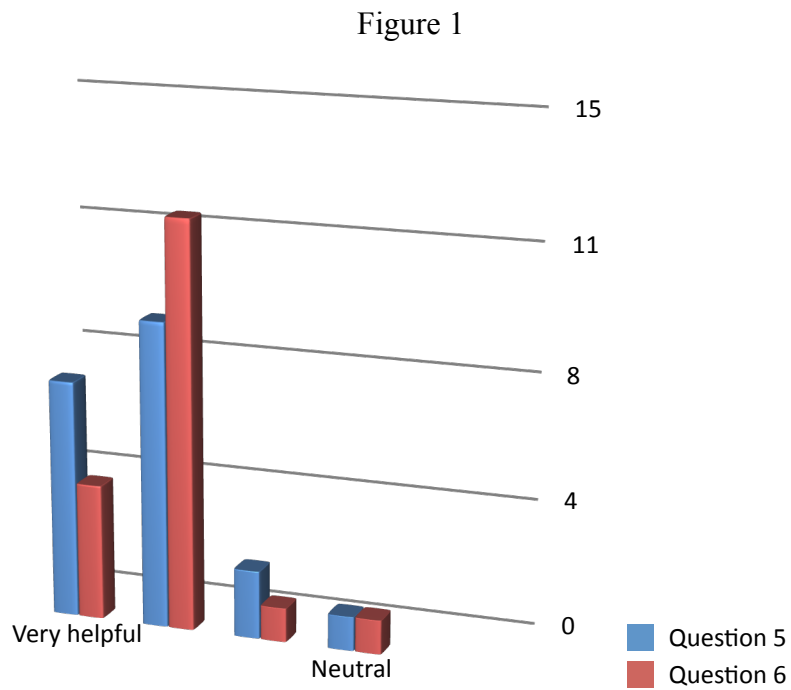
Noticeable 4

A great deal 3

Total respondents 14

Discussion of the results

Figure 1 presents the results for Questions 5 and 6 of the first post-survey:



Question #5: How helpful was the workshop for your current stress level?

Question #6: How helpful do you feel this workshop will be for managing stress before taking the Florida Comprehensive Aptitude Test (FCAT)?

As can be seen above, none of the students characterized the workshop as “not at all helpful,” whereas 16 of the 19 students chose the options “Very helpful” or “Helpful” on Questions 5 and 6. Not surprisingly, a greater number of students (7) found the workshop very helpful for their current stress level than those who felt it would be helpful for the FCAT (4); three of those who found the workshop “Very helpful” for their current stress level believed it would be “Helpful” for the FCAT. This differentiation is not unexpected, as students answered questionnaires comparing an experience that they felt at that present moment with a hypothetical one that they would feel in the future.

Both the first and second post-surveys shed more light on which elements the students found helpful in the workshop. Figure 2 presents a summary of the results for Questions 16, 17, and 18 of the second post-survey:

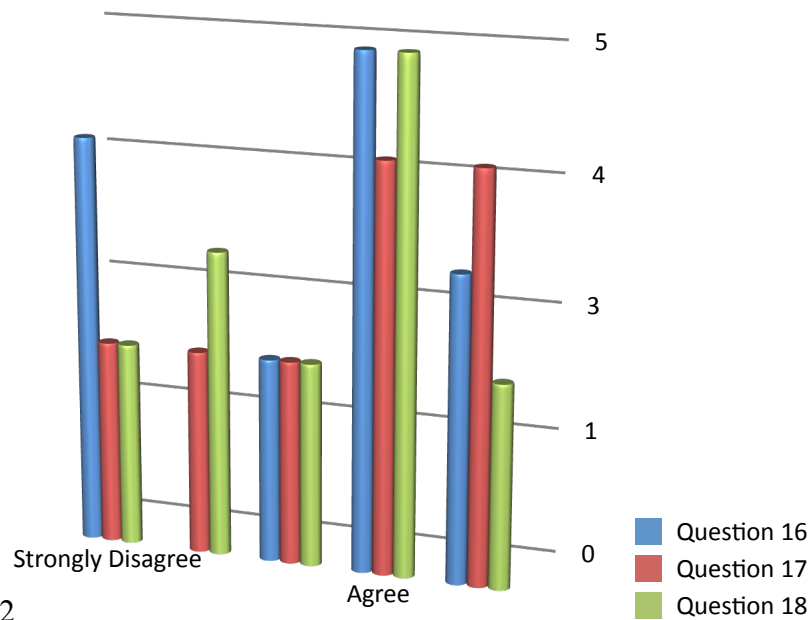


Figure2

Question #16: How much do you agree with the statement, “Since taking yoga class, I have practiced the breathing techniques that were taught at least once?”

Question # 17: How much do you agree with the statement, “Since taking yoga class, I am more aware of my posture?”

Question # 18: How much do you agree with the statement, “I have used the breathing techniques that I learned from yoga before taking a test and it helped me to relax?”

Over half the students (8) “Agreed” or “Strongly Agreed” that the yoga workshop had taught them posture awareness and breathing techniques that aided them after the workshop, and 7 reported that the breathing techniques had in particular helped them to relax before taking a test. This data is meaningful in light of Question 10 in the first post-survey, which asked students how difficult it was to focus on the breath. In response to that question, only 4 students had responded that it had been “not difficult at all” to focus on the breath during yoga practice, yet despite this perceived difficulty, in the second post-survey 8 students had reported using the breathing techniques they had learned in the workshop, and 7 reported using them specifically before a test. This emphasis on participants’ appreciation of breathing techniques in particular is in keeping with the conclusions reached in the abovementioned study undertaken by Wilson et al., 55% of whose subjects reported that the breathing exercises were helpful to “a great deal,” compared to 48% who reported this about the asanas as they related to body stiffness, and 49% who reported this regarding meditation techniques they had been taught (2008, p. 68). As pointed out by the authors of that study, “Why breathing exercises are used more frequently than other practices, what specific techniques are practiced, and what particular benefits people gain from them are questions that deserve further investigation” (2008, p. 69); one hypothesis to the first question may be the quick shift that a person can make in his/ her breathing pattern, versus the longer nature of an asana practice or a meditation sitting.

The last question of the first post-survey points to other – at least short-term benefits – that the students reported seeing in themselves. In answer to “What was the most important piece of information that you learned from the workshop that will have a positive impact on your life as a student?,” respondents reported physical benefits, such as “New exercises I can use,” “It’s very good to exercise,” and “The breathing;” mental health-related benefits such as “Yoga helps stress,” “To focus and relax,” “To be calm”, “How to relieve stress,” “Take a deep breath when I stress up,” “Positive attitude and staying calm,” “A positive attitude about life,” and “Positive attitude, focus more, and relax;” and even more metaphysical benefits such as “See the light in others as well as myself,” and “To be more kind to people.” It would be highly beneficial to explore these elements in further research.

Directions for Further Research and Development

This study was a very preliminary investigation into the effects of yoga on stress management and subsequent academic achievement. A logical question that results from the study is whether the students taking part in the workshops did in fact obtain higher scores on their FCAT exams compared to other students. The scores from those examinations remain to be seen, but due to the brief nature of the study, it would be difficult to control for any confounding variables. Rather, this study simply points to the importance of undertaking a more thorough and larger-scale investigation into the subject. One outcome of “Chill Out!” 2009 was that the administration of the Middle School in which the workshop took place, upon hearing positive feedback about the yoga workshop from its students, asked the researchers to begin an after-school yoga class for 50 students that would run for 75 minutes, twice a week. This ongoing class will be made up of a younger cohort than those who took part in the research reported in

this article, and therefore may open up a possible comparative study between the two age groups. More significantly, it provides an excellent opportunity for detailed, follow-up longitudinal research that is more consistent in its variables (e.g. ensuring that surveys are always administered in the same manner), includes a control group of students not enrolled in the yoga class, controls for confounding variables, and incorporates descriptive analyses and tools such as paired t-test comparisons and the like. Such a detailed study can yield information that can be used constructively to incorporate yoga as a means of decreasing stress and thereby improving students' academic achievement.

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