



A STUDY OF CORRELATIONS AMONG YOGA ENHANCEMENT
DESIGN AND COGNITION OF COLLEGE STUDENT LEARNING
AND PRACTITIONER SUCCESS

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Abstract

In this study, this researcher investigated the extent to which incorporating yoga into the occupational therapy curriculum influenced student academic achievement and success and whether yoga enhanced the practitioner's practice with positive outcomes of the client's treatment. With the inclusion of yoga methods, students were able to concentrate better and focus on their required material to prepare them for the demands of academia and the future workforce. By establishing a yoga foundation in the students' higher education program of occupational therapy, they would be better prepared to interact or provide treatment to individuals with special needs. Students who become practitioners may need to have a method to cope with the stressors encountered from their work environment.

Occupational therapy in the treatment arena may at times be too repetitive and routine. Yoga may bring about a gentle and relaxed method that may also increase interest and energy. As practitioners, their focus is in providing the necessary treatment to clients and completing their workload that often may result in burn out. As students graduate and become practitioners in the field of occupational therapy, it also becomes essential to maintain a healthy lifestyle to instruct their clientele in such methods.

Findings of this longitudinal study indicated that students receiving the yoga intervention design did not have reduced test or reduced computer anxiety in comparison with the control groups of participants. Qualitative data revealed concerns in both groups of participants regarding taking tests and using computers. Difficulties implementing yoga into their busy lives were noted to be an issue.

A problem that confronts the college-level student today is the amount of anxiety interfering with academic performance. A need is present for educational interventions that could be lifelong in nature yet manageable for implementation and of low cost as with the use of yoga. Stein and Cutler (2002) indicated that a problem confronting society today is the inability to relax or to partake in health or wellness programs that will enhance or improve one's well being.

Practitioners and college students in the practice of occupational therapy and clients as recipients of occupational therapy often are surrounded by the demands of practice or treatment outcomes whereby wellness and joy are limited, thereby causing stressors to occur.

In this study, this researcher intended to examine the influence of an educational intervention, yoga, on student anxiety in computer usage and test-taking. Findings from this study may add to the existing literature on ways of reducing student anxiety in learning situations. Moreover, information was obtained on the extent to which yoga itself may contribute to improved student outcomes. In this study, this researcher showed that by incorporating yoga into occupational therapy, practitioners/college students provided a more enhanced treatment environment not only for their clients but for themselves as well. Practitioners managed stress more effectively in their workplace and established a more cohesive working relationship with colleagues. College students were able to improve or enhance their learning capabilities and cognition and have higher outcome results in coursework and tests. Clients were able to achieve more control over their therapy regime and have more satisfactory results.

Key Words: Yoga, Test Anxiety, Occupational Therapy, Complementary and Alternative Medicine

Introduction

Test Anxiety

According to studies conducted by the National Institute for Mental Health (NIMH, 2000), about 7 to 10% of college students report suffering from anxiety disorders. The counseling staff from the University of Notre Dame identified the most common of anxiety related disorders that would interfere with concentration and performance. Test anxiety can be normal for students even if they are well prepared. However, it is not normal for them to feel dizzy, nauseous, fight back tears, and experience a rapid heart rate throughout the test-especially

if they are well prepared. What often occurs to students who experience test anxiety is that they have talked themselves into believing they do not have the resources to respond to the challenge posed through the test. Students may also believe there will be a negative outcome that will be devastating to their future (Connections, 2005).

The Division of Student Affairs and Services from the University of Cincinnati (n.d.), listed information on test and performance anxieties and described these anxieties as responses specific to evaluative situations (e.g., being observed or evaluated by others). The primary threat in these situations is the possibility of failure and loss of self-esteem. Depending on the intensity of the anxiety response, the emotional, behavioral, and cognitive components of anxiety can interfere with the ability to perform the task at hand (e.g., test score, athletic or artistic performance). Approximately 20% of US college students experience symptoms of test anxiety and most athletes and artists experience performance anxiety at some point in their careers. Supon (2004) emphasized that a balance in various methods to master content must be established because this balance is the key to learning. At times, it is difficult to motivate students to explore content or subject areas of interest. Other avenues must be discovered that show mastery of content. It is necessary to seek better solutions for engaging students in the learning experience and cognition. Although a variety of methods exist that will alleviate test anxiety from teaching test-taking skills to teaching students to be better organized in study habits; relaxation exercises is also recommended to desensitize a student's anxiety.

Complementary and Alternative Medicine

The literature review indicates that the usage or incorporation of yoga in everyday life definitely provides a change in outlook towards life for the individual. A position paper from the American Occupational Therapy Association (AOTA) and published in the American Journal of

Occupational Therapy (2005) asserted that the usage of complementary and alternative medicine (CAM) can be used by occupational therapists and occupational therapy assistants to enhance the engagement of occupation with clients within the scope of occupational therapy practice (Giese, Parker, Lech-Boura, Burkhardt, & Cook, 2003).

There are five domains of CAM practice according to the National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health listed (NCCAM, 2002). They are 1. Alternative medical systems, 2. Mind-body interventions, 3. Biologically-based treatment, 4. Manipulative and body-based methods, and 5. Energy therapies. The terms complementary and alternative tend to be used interchangeably. For the purposes of this study, the term complementary will be used since the distinction between alternative refers to practices in place of and complementary indicates practices are accessed in conjunction with allopathic medical practices. Therefore, occupational therapy and yoga would be complementary with each other. Giese (2005) also indicated that it is important to conduct research to determine the efficacy and effectiveness of CAM practices in health and wellness arenas. The current number of studies is small.

Preparatory methods, such as CAMs, are being widely used by occupational therapists and occupational therapy assistants as purposeful activities to facilitate the ability of clients to engage in their daily life occupations (Giese, 2005). The profession of occupational therapy's core mission is to value engagement in occupations by supporting participation in context. Our everyday occupations encompass activities of daily living, instrumental activities of daily living, education, leisure skills, play, social participation, and work. It is appropriate to incorporate CAMs into occupational therapy as a means to encourage a client's engagement in meaningful occupation (AOTA, 2002).

As practitioners in occupational therapy, a determination must be made regarding whether or not to use CAMs in the delivery of occupational therapy services, by conducting evaluations that an occupational therapist is able to gain an understanding of the client's needs and priorities and thereby provide an appropriate intervention for treatment. It is with the evaluation and intervention that practitioners will be able to determine whether the use of CAMs would be consistent with the client's cultural practices, priorities and needs, is safe to use, and is an appropriate approach to facilitate the ability of the client to participate in daily life occupations (Giese, 2005).

Caplan, Harrison, and Galantino (2003) explained how practices within the holistic pattern range from A to Z—from acupuncture to Zen meditation and nearly everything in between. The belief of many holistic practitioners stems from a harmonious relationship between the body's internal and external environments. Health is the proper balance among mind, body, and spirit, along with the surrounding physical and social environments. Caplan et al. mentioned how complicated and difficult tracking of CAM use by therapists has been because, traditionally, occupational therapists have a rich history of holistic treatments.

According to Deutsch and Anderson (2003), challenges to CAMs approaches include the difficulty in validating usage because of the intricacy in measuring successful outcomes. Much relies on the sound decision-making process of practitioners who can systematically identify the problem and make decisions about efficacy. It is the skilled practitioner who will explore the possibility of including yoga as a complement to the existing plan of care for clients. Deutsch and Anderson (2003) also explained how many diagnostic groups are treated with yoga, for example, respiratory, pain management, cancer, along with areas of wellness, cognition, and

emotional well being. Many of these areas can be identified with the college-level student or the health care practitioner who is faced with a new environment and challenges.

McKenna (2003) described yoga as a technique that fulfills the ultimate destiny of life. The different forms of yoga seek a union with a higher power that can offer ways by which inner consciousness can grow. Although yoga is an internally focused discipline with spiritual connections, it is not a religion. Some yoga postures and exercises are designed to activate certain functions of the body and mind. Therefore, the ultimate aim of yoga is to attain the “realization of life,” (p. 90) not merely to cure mental or physical ailments.

Methods

The purpose of this study was to measure the impact of a yoga enhancement design and intervention on college student test anxiety and computer anxiety within the occupational therapy curriculum. Also studied was the extent to which the enhancement promoted a difference in lifestyle that would influence practice as well as one’s well being. According to Bandura (1982), people may misjudge their abilities and therefore become angry, frustrated, and lost in their focus on the task. It is likely that they may believe things or situations are more difficult than they really are. Yet, some individuals may see a difficult situation as a challenge and this may result in a strong sense of self-efficacy.

According to Gall et al. (2003), in a qualitative study the sample size is usually small. That is, a sample might consist of a single case. For this investigation, containing both quantitative and qualitative data collection procedures, the sample was relatively small for a quantitative study and relatively large for a qualitative study. The sample for the current study consisted of approximately 12 college-level students within an occupational therapy assistant program as the experimental group and 33 college-level students within an allied health program

as the control group from a south Texas community college. Within the students selected, some students used yoga and some students did not use yoga.

For the practitioners, a list of the previous five graduating classes was accessed to acquire a purposeful sample selection based on criteria of approximately 10 participants who are currently in practice. Participants were then randomly selected until the desired number of 10 students was achieved. Interviews were scheduled during times conducive to both parties (participant and researcher). Schedules were determined with the students and practitioners to arrange the best meeting times for interviews. The selection of such a small sample is suited for this type of study, because the purpose will focus on the depth of qualitative inquiry (Patton, 2002).

Through use of a Likert-format survey, participants were asked to check their level of agreement with various statements. Likert scales are a common type of attitude scales (Gall, Gall, & Borg, 2003). It is important for individuals within the sample to have sufficient knowledge and understanding to express meaningful opinion about the topic, otherwise, the responses to the scale would be of questionable value. Gall et al. (2003) expressed the importance of dealing with individuals who lack familiarity with a topic by including a “no opinion” option (p. 229). However, individuals with little or no information about the topic might express an opinion to conceal ignorance, or because a feeling of social pressure exists to express a particular opinion.

Patton (2002) indicated that the use of qualitative methods could be helpful in research. There is a systematic collection of information regarding the activities, characteristics, and outcomes of programs that then are used to make judgments about the specific program, improve its effectiveness, and/or provide decisions about future programming. “Evaluative research, quite

broadly, can include any effort to judge or enhance human effectiveness through systematic data-based inquiry” (p. 10).

This current study followed the heuristic inquiry method (Patton, 2002) that is described as a form of phenomenological inquiry. One of the elements of heuristic inquiry is that the researcher must have personal experience with and intense interest in the phenomenon under study. A focus is also present on intense human experiences. Results are from discoveries, personal insights, and reflections of the researcher. Through interviews, participants provided the researcher with information through verbal interchange or conversation. Non-verbal behaviors and the interview context were noted by the researcher and became part of the data (Law, Stewart, Letts, Pollock, Bosch, & Westmorland, 1998). Participant observation is useful when the focus of interest is how activities and interactions within a setting give meaning to beliefs or behaviors. Differences may exist between what people say and what people do (Law et al., 1998).

By combining questions and information from different sources, some adaptations and modifications were made to address the issues pertinent to students from the South Texas Community College. The final Likert scale for this study consisted of 20 questions. According to Gall et al. (2003), the usage of a Likert scale provides for content analysis with an objective systematic description involved in collecting data with simple classifications of specific information related to the anxiety level of students during computer test-taking. Green and Salkind (2005) described the use of repeated measures with an analysis-of-variance (ANOVA) based design that allows the participant to be measured several times. For instance, data collected through analyzing the anxiety levels of students weekly prior to testing would make for a powerful analytic technique.

The instrumentation also consisted of semi-structured interviews as well as informal conversations to gather perceptions of the participant with regard to their overall performance with successful completion within their program. Hoepfl (1997) explained that qualitative interviews may be used either as the primary approach for data collection or in combination with observation and document analysis. This study included semi-structured interviews, observation, and document analysis. Additionally, the viewpoints from practitioners were gathered to assess their perceptions on approaches and lifestyle experience. The interviews were created for this study so participants (college-level students) could self-report their viewpoints and interest level of using yoga to enhance their academic performance. Practitioners were also able to self-report their satisfaction within practice and the effects of patients with debilitating conditions. Qualitative data were collected via semi-structured interviews and observations of participants during stressful activities; for example, while test taking. This process provided a deeper understanding and clearer explanations. Demographic practitioner data collected were the years of clinical practice, gender, and usage of yoga practice within the clinical arena. Questions generated were reviewed by three experts in the field of occupational therapy by practitioners who also practice yoga. According to Patton (2002), hermeneutic researchers create certainty for interpretation of data with the assistance of participants.

Green and Salkind (2005) described that in one-way repeated-measures Analysis of Variance (ANOVA) each participant in a study would have the same measure, in this case a Likert-format survey, administered repeatedly. In a Likert scale, participants are asked to respond to a series of statements by indicating whether there is a sense of anxiety. Each response was associated with a point value, and the participant's score was determined by summing the point values of each statement (Gay & Airasian, 2003). Aggregated responses across the survey

items were analyzed between the experimental and control groups across the weeks of the yoga intervention design.

Patton (2002) referred to the usage of an interview guide to ensure that basic lines of inquiry are pursued with each participant interviewed. The usage of an interview guide allowed for the freedom to explore, probe, and ask questions that will clarify any information related to the topic area. Conversation can then be built or elaborated depending on the format of spontaneous responses. The combination will allow for flexibility in probing and exploration on subject matters to greater depth. The interviewer can establish a conversation style yet remain focused on the identified topic.

The qualitative open-ended interview data were analyzed and interpreted by looking for patterns and integrating differences in responses from the participants. Data were collected and recorded as fully and fairly as possible from the participant's perspective (Patton, 2002). The audio recordings were transcribed for content analysis and coded for any emerging themes that occurred. The raw data, placed into logical and meaningful categories, were then examined in a holistic fashion. Words, phrases or events that appeared to be similar were grouped in the same category or theme and color coded. The purpose of coding is to not only to describe, but more importantly, to acquire new understanding of a phenomenon of interest (Hoepfl, 1997). The researcher transcribed all notes taken from interviews into a word document file, which provided the opportunity to become familiar with the cumulative data as a whole. A master copy of the file was kept in a safe and secure place with one hard copy kept handy throughout the analysis. An additional copy was used to write on and additional copies saved on separate computer discs were used to cut and paste. The master copy remained as a key resource for locating materials and to maintain the context for raw data (Patton, 2002).

Results

The findings are divided into two major categories. First, the quantitative findings are presented, including an analysis of the scale items of the questionnaire. Second, the results of both the open-ended questionnaire items and responses are presented providing a deeper understanding of the results from the survey. The study's research questions were evaluated using both quantitative and qualitative data analysis techniques.

Essentially, the participants (both from the experimental and control groups) realized that being prepared prior to an exam was necessary. For the most part, many of the participants practiced some form of stress release. However, most participants did not practice on a regular basis and as a result, their anxiety levels tended to fluctuate periodically depending on the amount of preparation for testing. Many participants did express an interest in learning correct deep breathing techniques. Some participants from the control groups who were familiar with and who practiced deep breathing techniques were pleased with the results.

In the quantitative portion of this study, findings were that the experimental group differed from the control group both at the beginning of the intervention and at the finish of this study. The analysis yielded a statistically significant result, $t(18.914) = 3.643, p < .002$. Table 1 shows that the experimental group's test anxiety score was over 8 points higher than the control group's test anxiety score. At the conclusion of the yoga intervention design, another independent samples t -test was conducted, with group membership serving as the independent variable and test anxiety serving as the dependent variable. This analysis also yielded a statistically significant result, $t(30.135) = 3.525, p < .001$. Table 1 again showed that the experimental group's test anxiety score was still over 8 points higher than the control group's test anxiety score. Thus, the initial difference in test anxiety was still present between the two

groups at the conclusion of this intervention, indicating that the intervention was not effective in reducing the test anxiety of these participants.

Table 1 *Descriptive Statistics for Test Anxiety Scale Across All 10 Measurements*

		<i>n</i>	<i>M</i>	<i>SD</i>
Experimental Group	Test Anxiety One	12	40.750	6.757
	Test Anxiety Two	12	38.667	6.759
	Test Anxiety Three	12	39.667	6.429
	Test Anxiety Four	12	41.167	5.622
	Test Anxiety Five	12	41.750	6.621
	Test Anxiety Six	12	40.417	6.259
	Test Anxiety Seven	12	40.417	6.259
	Test Anxiety Eight	12	40.750	6.757
	Test Anxiety Nine	12	40.750	6.757
	Test Anxiety Ten	12	40.417	6.259
Control Group	Test Anxiety One	32	32.531	6.411
	Test Anxiety Two	33	32.000	7.762
	Test Anxiety Three	33	32.485	8.635
	Test Anxiety Four	33	31.727	7.775
	Test Anxiety Five	32	31.500	7.792
	Test Anxiety Six	33	31.758	9.890
	Test Anxiety Seven	32	31.938	9.658
	Test Anxiety Eight	32	32.469	6.486
	Test Anxiety Nine	33	32.061	7.697
	Test Anxiety Ten	33	31.758	9.562

In the qualitative portion of this study, the findings indicated similarities in factors affecting test anxiety within the experimental and control groups. Although, the experimental group utilized deep breathing techniques prior to test taking, consistency with practice appeared to have an impact. Participants from the experimental group expressed being timed or running out-of-time would tend to raise their test anxiety and affect performance. The most participants within the control group seemed to have set routines for preparation of testing. This preparation allowed

the participants from the control group to monitor and diminish their test anxiety, which would show better performance in testing.

As practitioners in the field, many participants indicated the awareness and importance of practicing relaxation methods for improved health benefits. Yet, few actually continued practiced of any relaxation methods post graduation. The three participants included in this study expressed a realization of improved work performance and therapy practice was carried out more smoothly.

Conclusion

Data about yoga intervention design used to reduce test anxiety and computer anxiety indicated that participants were fully aware of the benefits from yoga or any relaxation method. Yet, consistency in practice or establishing a regular routine tended to be difficult for most students. Lack of consistency in carrying out any form of regular exercise for reducing stress becomes complicated with the many course demands, for example, preparation for homework assignments, class presentations, and studying for exams. Previous researchers had suggested that students are able to enhance learning and concentration skills with regular yoga practice. As instructors, providing an environment that is conducive to learning is critical. Students must be able to learn methods that will help them balance the necessary day-to-day requirements (college life, family life, and work schedules, if any). Relaxation exercises have been a recommended strategy to desensitize a student's anxiety (Supon, 2004).

The findings suggest that most students experienced difficulty balancing their schoolwork and their personal time. Participants recognized the importance and value of test taking and being part of an allied health profession. Some participants expressed that alternate methods for test taking should be considered, such as practical demonstrations from their clinical settings. No

difference was present in computer anxiety across the repeated measurements. The amount of computer anxiety reported by students did not change across the 10 repeated measurements; the average scores for the experimental and control groups were very similar across the repeated measures. What this similarity signifies is that when asked about their test anxiety and computer anxiety, students in general experience a moderate amount of test anxiety. Students have a strong desire to incorporate some type of relaxation technique but lack the organizational time management skills for incorporating some form of relaxation technique.

This research has delineated some issues with test anxiety and computer anxiety among college-level students. It was found that most students are aware of their anxious behaviors and limitations related to testing. Further research is needed, however, on the consistency of practicing some form of relaxation for building student's confidence factor. The literature showed that yoga has been incorporated in many schools across the country. By incorporating yoga in the early school years, students at an early age would learn habits that would instill automatic routines for yoga practice. The yoga practice would then become a daily regime, such as grooming, dressing, and studying.

The sample for this current study included only three practitioners who continued with either yoga or deep breathing methods to reduce their anxiety levels. The challenge remains to incorporate a simple yoga relaxation regime within the curriculum so students build a routine of relaxation techniques that will continue throughout their coursework and into their professional careers. More research, both quantitative and qualitative, is needed in which group comparisons can be made. Possible study topics include the following:

- Gender-based differences in the perception of relaxation techniques for lowering test anxiety.

- Campus-based differences in the perception of anxiety with computerized testing.
- Cohort-based differences in the consistency of implementing relaxation techniques for reducing test anxiety.

Only through further research on the experiences of students who have successfully incorporated relaxation techniques to lower test anxiety symptoms and those who have not established consistency with relaxation techniques will researchers be able to fully understand the factors associated with yoga practices and the lowering of test anxiety. This researcher took a step in that direction, but further study is needed to complete the task.

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