

# THE IMPACT OF COLLABORATIVE TESTING ON TEST ANXIETY

Breanne Bovee, DC<sup>1</sup>

<sup>1</sup> *Graduate Fellow*

Palmer Center for Chiropractic Research

10000 Brady Street

Davenport, IA 52803

## THE IMPACT OF COLLABORATIVE TESTING ON TEST ANXIETY

### ABSTRACT

**Objective:** High-stakes testing environments may lead to test anxiety in college students and may negatively impact college performance. Learning strategies related to test taking, test administration and test preparation may reduce test anxiety. Collaborative testing is one possible method for reducing test anxiety. A decrease in test anxiety may also lead to other positive benefits such as improved test scores, increased confidence, critical thinking and student satisfaction. This paper examines collaborative testing's effect on test anxiety in students at professional health institutions.

**Data Sources:** The literature was searched using PubMed, google scholar Ebscohost and Science Direct. Indexing terms included *collaborative testing* and *test anxiety* in the English language only.

**Study Selection:** Studies were selected if they examined test anxiety and collaborative testing at professional health institutions. Seven articles were initially selected. After reviewing, 4 articles were eventually chosen.

**Data Synthesis:** Results were similar in the 4 studies. Students who took tests collaboratively had a reduction in test anxiety compared to students who took tests individually. Other interesting findings were improved test scores, increased confidence, critical thinking skills and student satisfaction.

**Conclusion:** Collaborative testing may help reduce test anxiety. Faculty and administrators may want to incorporate this testing strategy into their classrooms to help reduce test anxiety. Findings of improved test scores, increased confidence, increased critical thinking skills and positive student's attitudes may result from a decrease in test anxiety, collaborative testing or both. Further evaluation of collaborative testing's impact on test anxiety and academic performance is needed. (Chiropr J Australia 2016;44:214-221)

Key Indexing Terms: Collaborative Testing; Test Anxiety; Nursing; Chiropractic; Group Testing

### INTRODUCTION

Anxiety is defined an abnormal and overwhelming sense of apprehension and fear often marked by physical signs (such as tension, sweating, and increased pulse rate), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it (1). Some students may suffer from test anxiety which is a form of anxiety (2). Test anxiety may be caused by cognitive activities such as negative self-talk, time constraints for studying, prior testing experiences and comparisons with peers (3). Additional causes can

include fear of finishing the test on time, forgetting studied material and fear of failure (4). The effects of test anxiety have an impact on cognitive function, mental, emotional and physical well-being (3,5).

Test anxiety can effect students mentally. Students may have a difficult time focusing and recalling studied material. Students might also portray fear and avoidance behaviors such as not studying for a test and worrying about failure (3,5).

Test anxiety might also effect students emotionally. Students may feel ashamed and emotionally isolated because of test anxiety. It is also correlated with depression (4). The negative thoughts associated with test anxiety can also effect a student's subjective well-being (6). It may also interfere with student's ability to be fully engaged in everyday life activities (5). According to a study of pharmacy students, those with test anxiety are likely demotivated. If test anxiety is decreased, then motivation may increase (7).

Physical well-being may also be impacted by test anxiety. Test anxiety has been shown to change a person's activities of daily living. Sleeping patterns may be effected by students staying up all night studying or worrying about an exam. Eating habits may also be effected. Some students can be so anxious that they do not eat. Others may eat unhealthy snacks to try to relieve stress, but in turn make a person feel worse physically (3). Increased anxiety during an exam also has an increased effect on heart rate fluctuation. Students in anxiety producing exam situations may also experience an inhibitory effect on parasympathetic activity and an increase in sympathetic activity which can increase mental effort (8).

Test anxiety has been shown to have a negative impact on academic performance (2, 9-10)). Furthermore, high anxiety levels have been a cause for several physiological and psychological reactions in students, similar to those previously mentioned, which may in turn interfere with acceptable performance (10). If test anxiety is a problem for students, teachers and administrators may wish to look for strategies to reduce it. Additional research on test anxiety can lead to helpful strategies for test preparation, test taking and test administration (2). Reducing test anxiety may benefit students in multiple ways.

Traditionally, students take tests individually. An alternate test taking approach, collaborative testing, is defined as a method of evaluation in which students work together on an assessment (11). Collaborative testing is an innovative approach to test taking that may provide benefits for students in professional health institutions. One positive benefit is that collaborative testing may lessen test anxiety (10-13). A reduction in test anxiety may impact other areas in a student's life such as test scores, confidence and attitudes. Additionally, collaborative testing is a learning strategy used to foster knowledge development and encourage critical thinking in decision-making (14). Collaboration can also provide a positive atmosphere for learning during assessment. Moreover, collaborative testing may positively impact learning content and may help students understand, gain confidence, study more and think critically (15). Collaborative

## Test Anxiety

Bovee

testing also allows for immediate feedback from peers, which may aid understanding. It also may also contribute to a more positive psychological well-being (14).

This paper examines the effect collaborative testing has on test anxiety in students at professional health institutions. Other factors that may be contributed to decreased anxiety, collaborative testing, or both, will also be examined. These factors include academic performance, confidence, critical thinking, and students' attitudes. Learning more about collaborative testing may help students in the classroom. It may also help prepare students for the collaboration that happens in the health care field.

## DISCUSSION

The literature was reviewed using PubMed, google scholar, ebscohost and Science Direct. Indexing terms included *collaborative testing and test anxiety* in the English language. Inclusion criteria was that collaborative testing and test anxiety had to be studied and that the studies had to be at professional health-care institutions. Articles not at professional health-care institutions were excluded. Seven articles were initially selected that appeared to meet the inclusion criteria. After reading the articles, 2 were rejected because they studied collaborative testing at an undergraduate college not a professional health institution. One study was also rejected because it used modified group testing not collaborative testing. Four articles were chosen because they measured the impact of collaborative testing on test anxiety. Additional findings of increased test scores, confidence critical thinking, and student attitudes were also of interest.

Meseke and colleagues (2009) studied the impact of collaborative testing in students in a chiropractic clinical science course. Two, 1 hour long classes were compared. Each class was taught and tested on the same material. One class of 46 students took tests individually and the other class of 43 students took tests collaboratively for 3, 15 point unit examinations. All students took the final exam individually. Immediately before the exam, students were randomly assigned into 1 of 10 collaborative testing group's containing 4-5 students 'each. The collaborative testing group did not have to come to a consensus on the answer because each student turned in their own separate answer sheet. A 9 question likert scale testing survey was administered 1 week after the third unit examination. Results reported reduced test anxiety in students using the collaborative testing method compared to students testing individually. Additional interesting findings were that students in the collaborative testing class scored significantly higher on all unit exams. There was no difference in the results between groups on the final exam. Students also had a more positive attitude regarding their testing method in the collaborative testing group. Students testing collaboratively also reported increased confidence in their judgements on test questions. There was no difference in exam preparation reported (12).

Another study by Meseke and colleagues (2010) analyzed collaborative testing in a chiropractic basic science course. One group of 78 students took quizzes individually from April 2008 to June 2008 and another group of 80 students took quizzes collaboratively in groups of 3 from January 2008 to March 2008. There were 6 weekly

quizzes, 15 points each and 3 exams along with a comprehensive final exam. All students completed exams as individuals. Students were randomized into collaborative groups immediately before the weekly quizzes. Each student turned in their own answer sheet and did not have to come to a consensus with the group. A survey regarding student attitudes scored on a 4 point likert scale was given to all students after the third unit exam. The collaborative testing group reported a decrease in test anxiety. Additionally, students in the collaborative testing group had significantly higher quiz scores. Students who tested collaboratively also reported a more positive attitude toward the testing process. Increased confidence in judgements on exams was also noted for the collaborative testing group (11).

Sandhal 2003 studied the effects of collaborative testing with nursing students. One hundred and ten students were randomly divided into groups of 3 or 4. There were 4 unit exams and students were randomized to take 2 unit exams as individuals and the alternate exams in groups. A group consensus was not required as each student turned in their own answer sheet. All students took the final exam individually. After each collaborative testing experience, students completed the Group Testing Evaluation which measures student's perceptions about the collaborative testing process. Students also took a 6 question course evaluation about their perceptions of anxiety and learning at the end of the semester that was scored on a likert scale. Only 33% of students had moderate levels of anxiety, most reported having minimal to slight anxiety. Exam scores were also significantly higher for the collaborative testing group. Students in the collaborative group also reported more positive relationships among students and noted the importance of hearing colleague's perspectives (16).

Lusk and Conklin 2000 evaluated collaborative testing in nursing students. One semester, 24 students took 3, 50 question multiple choice unit exams and a 100 question final exam individually. The next semester 25 students took the unit exams using the collaboratively but took the final exam individually. Students were randomly assigned into groups of 2-3 the day of the test. Students worked independently for the first 40 minutes of the exam and collaborated with their group for the last 20 minutes of the exam. Consensus was not required as students turned in their own individual test sheet. Students were asked to write their feelings about collaborative testing after participating in the process. A reduction of test anxiety was universally reported. The collaborative testing group also scored significantly higher on unit exams (13).

Findings in all 4 studies suggest collaborative testing benefits students in professional health institutions. All 4 studies suggested that students using the collaborative testing method had a reduction in test anxiety (11-13, 16). The reduced levels of test anxiety suggest that collaborative testing may be a helpful tool to incorporate at professional-health institutions. Test anxiety can lead to negative effects (2, 9) so approaches to reduce it should be considered when developing curriculum.

Additional benefits of collaborative testing were also noted such as an increase in academic performance, confidence, critical thinking skills and more positive student attitudes. In all 4 studies, collaborative testing was used for the unit exams and a comparison group of students took the exams individually. Individual testing was used for the final exam for all students. The collaborative testing students' unit exam scores

## Test Anxiety

Bovee

were higher than the individual testings' exam scores in all 4 studies. However, during the final exam, all students' scores were similar for both groups. This suggests that the increase in the collaborative testing groups' scores on the unit exams may be due to student collaboration (11-13, 16). Additionally, student's confidence relative to the ability to take the test was enhanced with the collaborative testing method (11-12). An increase in critical thinking was also noted for 3 out of the 4 studies (11-13). Furthermore, students had positive perceptions of the collaborative testing process (11-13,16). The benefits of increased confidence and a positive attitude are important qualities for future health-care providers to possess. Strategies to help promote these positive qualities may be beneficial to incorporate into the classroom.

Additional unexpected findings were noted in the studies as well. Faculty noticed students assuming more responsibility (13) and studying harder so they would not let their partners down (11-13,16). Faculty reported that the atmosphere of the classroom also shifted to a more positive one (13). Students also learn to work as a team toward a common goal (13). Collaboration is important for providing the best care possible for patients. Thus, it may be important to help students develop these skills by providing opportunities to collaborate in the classroom. Findings of improved test scores, increased confidence, increased critical thinking skills and positive student's attitudes may result from a decrease in test anxiety, collaborative testing or both.

Other studies have also tried to determine the effects of collaborative testing and found results similar to our study findings. In a study by Gallagher, out of 163 students, 63% agreed that collaborative testing decreased test anxiety. Students also felt more confident when taking tests with peers (15). Additionally, a study involving nursing students using a modified collaborative testing technique, showed that out of 34 students, 97% had a reduction in test anxiety. Test scores were also increased (10). Furthermore, decreased test anxiety and high test scores were noted in psychology students using collaborative testing methods (17). The decrease in test anxiety the aforementioned studies is consistent with what was found in the literature.

In contrast to our results, Breedlove suggested that there was no significant difference in anxiety levels between students who tested collaboratively versus individually. The study discusses that collaboration may increase anxiety for students if they become worried over their lack of preparation when working with peers (18). The discrepancies between studies may be due to differences in data collection. The Breedlove study used a likert-scale to measure anxiety immediately before and after the test. Some of the other studies only measured anxiety based on student free form responses. Additionally, the Breedlove study compared pre to post-test anxiety levels, whereas the other studies analyzed post-test anxiety levels only. Additionally Lusk and Conklin only used a written free form method to gather information on test anxiety. It is difficult to compare quantitative and qualitative methods.

Traditionally, teachers administer tests and students take them as individuals and talking among peers would be considered cheating (13). Professional health institutions may want to use collaborative testing methods because it appears to benefit students in the classroom. It also teaches them skills they should use in the health-care field.

Collaboration in the classroom can help prepare future health-care providers to do the same in practice, which may ultimately benefit the patient (16).

Four databases were searched during this literature review. Articles chosen from the search result list were determined by information obtained from titles and abstracts. The full article was not read until after sorting through the titles and abstracts. This study can be improved by searching more databases, and by obtaining all articles on the subject.

## CONCLUSION

The benefits of collaborative testing may encourage healthcare faculty and administrators to incorporate it as a testing strategy. It has been shown to reduce test anxiety. Furthermore, collaborative testing may help improve performance, confidence, and critical thinking skills while at the same time decreasing test anxiety. Collaborative testing may also help students prepare for cooperation in today's health care field. Future evaluation of collaborative testings' impact on test anxiety and academic performance in health-care institutions is needed. Future studies should examine student's pre and post-test anxiety levels.

## REFERENCES

1. Definition of Anxiety. <http://www.merriam-webster.com>, accessed May 14, 2016
2. Zhang N, Henderson CNR. Test anxiety and academic performance in chiropractic students. *J Chiropr Educ* 2014;28:2-8
3. Encandela J, Gibson C, Angoff N, Leydon G, Green M. Characteristics of anxiety among
4. Kurt AS, Balci S, Kose D. Test anxiety levels and related factors: Students preparing for university exams. *J Pak Med Assoc* 2014;64:1235-1239
5. Hjeltnes A, Binder P-E, Moltu C, Dundas I. Facing the fear of failure: An explorative qualitative study of client experiences in a mindfulness-based stress reduction program for university students with academic evaluation anxiety. *Int J Qual Stud Health Well-being* 2015;10:27990
6. Steinmayr R, Crede J, McElvany N, Wirthwein L. Subjective well-being, test anxiety, academic achievement: Testing for reciprocal effects. *Front Psychol* 2016;6
7. Rajiah K, Saravanan C. The effectiveness of psychoeducation and systematic desensitization to reduce test anxiety among first-year pharmacy students. *Am J Pharm Educ* 2014;78
8. Dimitriev DA, Saperova E V, Dimitriev AD. State Anxiety and Nonlinear Dynamics of Heart Rate Variability in Students. *PLoS One* 2016;11medical students and congruence strategies to address it. *Med Educ Online* 2014;19
9. Cassady J. Cognitive test anxiety and academic performance. *Contemp Educ*

## Test Anxiety

Bovee

Psychol 2002;27:270-295

10. Phillips AP. Reducing nursing students' anxiety level and increasing retention of materials. J Nurs Educ 1988;27:35-41
11. Meseke C a, Nafziger R, Meseke JK. Student attitudes, satisfaction, and learning in a collaborative testing environment. J Chiropr Educ 2010;24:19-29
12. Meseke C A, Bovée ML, Gran DF. Impact of collaborative testing on student performance and satisfaction in a chiropractic science course. J Manipulative Physiol The 2009;32:309-314
13. Lusk M, Conklin L. Collaborative testing to promote learning. Journal of Nursing Education 2003;42:121-124
14. Rao SP, Collins HL, DiCarlo SE. Collaborative testing enhances student learning. Adv Physiol Educ 2002;26:37-41
15. Gallagher PA. Collaborative essay testing: group work that counts. Int J Nurs Educ Scholarsh 2009;6:1-11
16. Sandahl SS. Collaborative testing as a learning strategy in nursing education. Nurs Educ Perspect 2010;3:142-147
17. Haberyan A, Barnett J. Collaborative testing and achievement: are two heads really better than one? J Instructional Psychol 2010;37:32-40
18. Breedlove W, Burkett T, Winfeild I. Collaborative testing and test anxiety. J Scholarsh Teach Learn 2004;4:33-42