



## **Effects of Progressive Muscle Relaxation Technique on Test Anxiety among Secondary School Students**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Authors CN and MOB managed the literature searches and performed the statistical analysis. Author URE handled the discussion of the study. All authors read and approved the final manuscript.*

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### **ABSTRACT**

This study investigated the effects of progressive muscle relaxation technique on test anxiety among secondary school adolescents in Onitsha North Local Government Area. Two research questions guided the study and two null hypotheses were tested at 0.05 level of significance. Quasi-experimental research was adopted in carrying out the study. A sample size of 68 was chosen from a population of 282 adolescents in SS1 with test anxiety. The sample was derived from two schools selected using purposive sampling technique based on the number of students who scored high on test anxiety. The instrument, Test Anxiety Inventory (TAI) was used for data collection. Data relating to research questions were analysed using statistical Mean while data relating to hypotheses were analysed using Analysis of Covariance (ANCOVA). Findings from the study revealed among others that though the reduction of secondary school students' test anxiety

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after progressive muscle relaxation technique differ significantly with that of the conventional counselling group but it was still above the base line of the TAI therefore progressive muscle relaxation technique was not effective on secondary school adolescents' test anxiety. Based on the findings, implications of the study were noted and recommendations made that Since the technique progressive muscle relaxation was found not to be effective, but significantly reduced the test anxiety of the participants, the technique should not be used alone by the guidance counsellors in helping clients, especially adolescents in overcoming their test anxiety in schools.

*Keywords: Progressive muscle relaxation; technique; test; anxiety; students.*

## 1. INTRODUCTION

### 1.1 Background to the Study

Test anxiety is a problem to many students. The reason for this may be because in the Nigerian education system the prevalence and significance of standardized testing has been increasing along with the stakes of the testing format. For instance, students must write Junior School Certificate Examination (JSCE) and pass it before moving to senior class. They must also write the Senior School Certificate Examination (SSCE) and pass with at least five credits including English and Mathematics before they can secure admission into higher education which is today the dream of every child; and when they finally do, they must pass with good grades to get a good job after school. As a result, today's students are associating a greater sense of consequence with the prospect of being tested, resulting in feelings of pressure to perform and great tendency of being overpowered with fear of not performing adequately. In essence, a lot of these secondary school adolescents are adversely affected by test anxiety. The concept of test anxiety has released different explanations in literature due to the manner and form in which it manifests. Test anxiety involves an interaction among physical, emotional tension, autonomic nervous system arousal, cognitive worry, doubt in one's abilities and behavioural responses that interfere with test preparedness. Test anxiety, according to [1] is seen as a psychological condition in which people experience extreme distress and anxiety in testing situations. According to [2], test is often associated with loss of control, fear of failure and psychological reactions. The thought of writing test alone increases students' stress and anxiety no matter the extent of the preparation. Also, information from students interviewed shows that the environment inside the examination hall also has an effect on students' test anxiety. Factors such as the sound of teachers alerting student on

the remaining minutes to submit their examination scripts and the possibility of the scripts being collected without the students finishing the examination have significant effect on increasing anxiety.

Also [3] noted the possibility of test anxiety forming a vicious cycle; that is, the possibility that after experiencing test anxiety the student may experience more anxiety on another test than he or she experienced on the previous one, such student may feel helpless if the cycle continues without him or her seeking for professional help. Test anxiety according to [4] is needed to motivate and aid the students to stay mentally and physically alert. This may be because a little anxiety tends to stimulate an individual to perform better. In this regard, [5] were of the opinion that feelings of anxiety arise to prepare a person for threats, this he went further to explain that different levels of anxiety predict different outcomes. However, high test anxiety becomes dangerous and can result in emotional or physical distress, concentration difficulties and emotional worries. According to [6], the degree to which an anxiety response is developed in an individual is based on the probability of bad things happening in the environment and the individual's ability to cope with them. High levels of anxiety are harmful, but moderate levels of anxiety may improve motivation on tasks that demand stamina or persistence [7]. High test anxiety interfere with students' ability to prepare for and perform on tests. Sometimes, some students even at high educational level and with high level of metacognitive skills strangely fail to demonstrate the knowledge they have acquired during teaching and learning sessions. Such students attend classes, do their assignments well but fail to perform optimally during tests, especially when the stakes are high. Furthermore ,adolescents who suffered from test anxiety tend to be consumed with feelings of anxiousness, worthlessness and absolute dread in regard to their academic achievement .In most cases, text

anxious adolescents in school tend to copy from each other's work, bribe and impersonates, many engage in cultism and other maladaptive behaviours in schools just to pass the test. Some of these students can degenerate to the extent of becoming depressed, unhappy and insecure while some drop out in the process because they find it hard to adjust in school. As a result test anxiety becomes a major concern because the tested individuals will expect to be regarded as competent and meeting the standards of certain criteria.

Notable efforts has been made by previous researchers such as [8,9] and [10] in finding a lifelong solution to the problem of test anxiety among secondary school adolescents. [9] for instance investigated the acute effects of progressive muscle relaxation on state anxiety in chronic Bulgarian patients with schizophrenia however, the problem no doubt still portend a serious challenge to guidance counsellors and other allied professionals today, while they work assiduously in seeing that an effective solution to the problem is realised.

Various forms of relaxation training have as well been used to mitigate the damaging effects of anxiety but it still remains a challenge and poses a serious threat to many student populations. This explains the need to explore other psychological techniques such as progressive muscle relaxation in handling students' test anxiety.

Progressive muscle relaxation (PMR) is a technique that was developed by American physician Edmund Jacobson in the early 1920s. According to [11] it is a relaxation technique that trains an individual to identify tension in various muscle groups and then relax that tension one group at a time. This technique involves the subject tensing specific muscle groups and then allowing them to relax. The PMR is part of a larger clinical physiotherapy programme consisting of aquatic sessions (once a week), walking (twice a week), yoga training (once a week), fitness training (twice a week), psycho-education about an active lifestyle (once every two weeks) and group related movement sessions with psychosocial and cognitive objectives (twice a week) [9]. Progressive muscles relaxation therapy may train adolescent to reduce their test anxiety level by deliberately inducing relaxation in their muscles. The therapy relies on applying tension and relaxing that muscle group, progressing through all the muscle

groups of the body to create a deep sense of calm. Progressive muscle relaxation for the purpose of this study is defined according to [12] as a physical relaxation technique in which an individual learns to achieve the goal of stress reduction by becoming aware of tensions in various muscle groups and then relaxing them one at a time throughout the body.

Progressive Muscle Relaxation (PMR) is a technique that involves the systematic tensing and relaxing of muscle groups. This involves focusing on the breath, reducing muscle tension, contracting and relaxing of a specific part of the body PMR was originally developed by Edmund Jacobson [13]. The original Jacobson method required lots of sessions where the participant was taught to relax 30 different muscle groups. However, [14] later shortened this technique to 16 muscle groups and found it to be equally workable [12]. [15] suggested that muscle relaxation can bring about physiological changes that help to reduce metabolic rate, decrease blood pressure and decrease middle cerebral artery blood flow. A systematic review conducted by researchers such as [16] look at the effectiveness of progressive muscle relaxation on psychological distress and anxiety symptoms and on response/remission for people with schizophrenia. The authors concluded that progressive muscle relaxation might be a useful add-on treatment to reduce state anxiety and psychological distress and improve individual well-being in persons with schizophrenia.

In other previous studies, such as [17], the (PMR) techniques have been shown to alleviate symptoms of anxiety and improve well-being in clients with panic disorder and generalised anxiety disorder. Studies on PMR as an intervention in treating trait anxiety in people with test anxiety has been on the course since the beginning of the 1980s for instance, [18] demonstrated that after 10 sessions of 40 minutes, PMR (five times a week) participants demonstrated reduced trait anxiety compared with a minimal treatment control. Similarly, [19] showed that the degree of trait anxiety improvement is significantly higher in a PMR group receiving 40 minutes of PMR for 11 consecutive days than in a placebo control group.

Test anxiety if untreated, can persist for years [20], but proper interventions can decrease anxiety and improve learning [21]. This has been

a phenomenon burning in the minds of researchers such as [22,23], and [24] seeking ways to unravel the cryptic threat posed by test anxiety. There has to be a change in the direction and approach in tackling this problem before it gets out of hand. This study therefore is set out to investigate the effects; that is the possible change that will take place as a result of progressive muscle relaxation treatment administered on secondary school adolescents with test anxiety in Onitsha North local government area.

### **1.1.1 Purpose of the study**

The main purpose of this study is to investigate the effects of progressive muscle relaxation techniques on test anxiety among secondary school adolescents. Specifically, the study intends to investigate;

1. The effects of progressive muscle relaxation technique on test anxiety among secondary school adolescents.
2. Whether there is any difference in the effects of progressive muscle relaxation treatment technique on test anxiety among male and female secondary school adolescents.

### **1.1.2 Research questions**

The following research questions were posed to guide the study.

1. What is the difference in the pre-test and post-test test anxiety mean scores of secondary school adolescents treated with progressive muscle relaxation technique when compared with those treated with conventional counselling?
2. What is the difference in the pre-test and post-test test anxiety mean scores of male and female secondary school adolescents treated with progressive muscle relaxation techniques?

### **1.1.3 Hypotheses**

The following null hypotheses guided the study, and were tested at the 0.05 level of significance:

1. There is no significant difference in the pre-test and post-test test anxiety mean scores of secondary school adolescents treated with progressive muscle relaxation

technique when compared with those in the control group.

2. There is no significant difference in the pre-test and post-test test anxiety mean scores of male and female secondary school adolescents treated with progressive muscle relaxation technique

## **2. METHODS**

### **2.1 Research Design**

This study is a quasi-experimental research. [25] described a quasi-experimental study as a type of experimental study that determines the effect of a treatment paradigm on a non-randomised sample. He acknowledged that a quasi-experimental research design could be used in a school setting where it is not always possible to use pure experimental design which sometimes is considered as disruption of school activities. In this study, the researcher adopted quasi experimental research design because the treatment was carried out in a school setting where it was not to possible conduct a true experiment. Treatments were introduced only to the experimental participants, after which the two groups (treatment and control group) were measured.

### **2.2 Area of the Study**

The study was conducted in Onitsha North local government of Anambra State. Onitsha is a city on the Eastern bank of the Niger River in Anambra State, Nigeria. Onitsha is surrounded by neighbouring towns like Ogbaru, Idemili North (Nkpor, Obosi), Oyi (Nkwelle –Ezunaka) and Anambra East (Nsugbe). There are sixteen secondary schools in Onitsha North local government area in Onitsha Education zone. These figures indicate that secondary school enrolment in the area is high.

The researcher observed that many students in this area are usually scared of writing tests; as a result many tend to get involved in many unwholesome acts such as cheating and sometimes bullying their fellow students, forcing them to disclose test answers to them in the examination hall just to pass. This sad situation could be attributed to test anxiety; as such negative phenomenon has the tendency of weakening students' will to reproduce what they have learned. In view of all these, the researcher therefore considered Onitsha North

local government area as a well suited area for the research study of this kind.

### 2.3 Population of the Study

The population of this study is 282 adolescents in senior secondary schools (SS 1 students) from all the coeducational secondary schools in Onitsha North local government area facing high test anxiety. Senior secondary 1 adolescents were chosen and moreover, they are not in external examination class. For the researcher to get the population of adolescents with test anxiety in the region, she visited the seven coeducational secondary schools and administered the Test Anxiety Inventory (TAI). Thus, this was regarded as the pre-test. A total of 2,016 copies of the TAI were administered with the help of briefed research assistants. Those found high in test anxiety (that is students with high scores above the norm of 34.37 /34.77 and above for male and female adolescents respectively as indicated in the Test Anxiety Inventory) made up the population of the study.

### 2.4 Sample and Sampling Technique

The sample size for the study is 68 adolescents. This comprises all the SS 1 adolescents chosen from the two coeducational secondary schools selected for the study. The sample size was derived from the population of 282 adolescents with high test anxiety scores from two coeducational secondary schools in Onitsha North local government area. Two schools were selected using purposive sampling technique based on the number of students who scored high on test anxiety in each of the 7 coeducational schools. The two schools with the highest number of students with high test anxiety (using the pre-test scores) served as the experimental groups I and II respectively. The sample size for each groups of Progressive Muscle Relaxation and Control respectively are 35 and 33.

### 2.5 Instrument for Data Collection

The instrument that was used for assessment is Test Anxiety Inventory (TAI). The instrument was originally developed by [26] but revalidated in Nigeria by [23]. TAI has been adapted to Nigerian setting and had been used extensively in Nigeria. The Test Anxiety Inventory (TAI) is a self-report psychometric scale which was

developed to measure individual differences in test anxiety as a situation-specific trait. The test contains twenty items (see Appendix), based on 4-point rating scale, ranging from 1 (almost never), 2 (sometimes), 3 (often), to 4 (almost always) [26]. The respondents were required to indicate how frequently they experience specific symptoms of anxiety before, during and after examinations. All responses of the twenty items on the TAI combined to yield a total score. The TAI total score ranged from 20 – 80, with high score indicating a high anxiety.

### 2.6 Validation of the Instrument

The researcher therefore adopted the TAI and did not have to do any validation.

### 2.7 Reliability of the Instrument

Coefficient alpha of 0.92 and higher has been reported for TAI total scores (Spielberger, 1980). Additionally, TAI has good internal consistency reliability among samples of secondary school and university students. Coefficient alphas of 0.88 and 0.90 respectively have been reported for both male and female samples. Test score stability over 2-4 weeks test-retest interval ranged from 0.80 to 0.81 for TAI (Spielberger, 1980). The coefficients of reliability obtained from the Nigerian samples ranges from 0.73 to 0.79 (Omoluabi, 1993).

### 2.8 Method of Data Collection

All the secondary students from all the coeducational secondary schools were given the Test Anxiety Inventory to fill. The researcher and six trained research assistants went round the secondary schools to distribute 2,016 copies of the questionnaire. Each participant in their individual classes were given the instrument TAI to respond to the items. The researcher gave an introductory instruction on how to complete the questionnaire to the students. The nature of the students' responses and the purpose which it will serve were clearly explained to the students. The researcher with the research assistants guided the students on how to respond to the questionnaire. The questionnaire sheets were collected from the students immediately they finished responding to the questionnaire items and were given to the researcher for collation and scoring.

Each response was scored according to the specification on the TAI manual. Scores that were above the Nigeria norm (34.37 for males and 34.77 for females) indicated the presence of test anxiety, while scores below this was an indication of having no problem with test anxiety. This enabled the researcher to identify test anxious students. These scores from the first administration of the questionnaire made up the pre-test. A special request was then made to the school principal for provision of adequate and conducive classroom for the administration of the treatment. After the six weeks experimental treatment and control group conventional group counselling, the instrument, TAI was re-administered on the students. The responses were collated, scored and analysed to determine statistical difference between the experimental and control groups.

**2.9 Method of Data Analysis**

The completed instruments were scored following the scoring instructions provided in the Test Anxiety Inventory (TAI) manual. Scores that were above the Nigeria norm (34.37 for males and 34.77 for females) indicate presence of test anxiety and scores below this show no problem with test anxiety. The data relating to the research questions were analysed using the mean. The data relating to the null hypotheses were analysed using the Analysis of Co-variance (ANCOVA).

**3. RESULTS**

**3.1 Research Question 1**

What are the differences in the pretest and posttest test anxiety mean score of students

treated with progressive muscle relaxation technique and those in the control group?

Table 1 shows that the students treated with progressive muscle relaxation technique had pretest mean score of 49.62 and posttest mean score of 38.08 with mean loss 11.54 in their anxiety, while the students in the control group who received conventional counselling had pretest mean score of 48.10 and posttest mean score of 42.10 with mean loss 6.0. therefore progressive muscle relaxation technique is not effective in reducing the students' test anxiety since the posttest mean score of the clients is above the norm 34.54.

**3.2 Research Question 2**

What are the differences in the Pretest and posttest test anxiety mean scores of male and female students treated with progressive muscle relaxation technique?

Table 2 indicates that the male students treated with PMR had pretest mean score of 51.05 and posttest mean score of 36.07 with mean loss 14.98 in their test anxiety, while the female students treated with PMR had pretest mean score of 49.62 and posttest mean score of 38.08 with mean loss 11.54 in their test anxiety. Therefore PMR technique reduced more of the male adolescents' test anxiety.

**3.3 Testing the Null Hypotheses**

**3.3.1 Null hypothesis 1**

There is no significant difference in the post-test test anxiety mean scores of secondary school adolescents treated with progressive muscle relaxation technique when compared with those in the control group.

**Table 1. Pretest and posttest test anxiety mean scores of students treated with progressive muscle relaxation technique and those in the control group**

Source of variation	N	Pretest mean	Posttest mean	Mean loss	Remark
PMR Tech.	37	49.62	38.08	11.54	Not effective
Control	21	48.10	42.10	6	

**Table 2. Pretest and posttest test anxiety mean scores of male and female students treated with progressive and relaxation technique**

Source of variation	N	Pretest mean	Posttest mean	Lost mean	Remark
Male	43	51.05	36.07	14.98	Reduced more
Female	37	49.62	38.08	11.54	

Table 3 indicates that at 0.05 level of significance, 1df numerator and 57df denominator, the calculated F 10.61 is greater than the critical F 4.00. therefore, the first null hypothesis is rejected. So, the difference in secondary school students' posttest anxiety reduction scores after progressive muscle relaxation technique differs significantly with that of the conventional counselling group but was still above the norm.

**3.3.2 Null hypothesis 2**

There is no significant difference in the post-test test anxiety mean scores of male and female secondary school adolescents treated with progressive muscle relaxation technique.

Table 4 shows that at 0.05 level of significance, 1df numerator and 79df denominator, the calculated F 2.58 is less than the critical F 3.97. therefore, the second null hypothesis is accepted. So, there is no significant difference in the reduction of male and female secondary school students' test anxiety treated with progressive muscle relaxation technique.

**4. DISCUSSION**

**4.1 The Effects of Progressive Muscle Relaxation Technique (PMR) on Students' Test Anxiety**

Finding from the study revealed that progressive muscle relaxation technique is not effective in

reducing students test anxiety. Although the finding showed a meaningful reduction in the level of students' test anxiety, it however did not prove to be effective. This is because the post-test mean score of the study participants is below the TAI norm. Although this finding did not totally agree with the finding of some previous studies such as [27], this finding is in line with [9] as PMR was noted to have reduced the level of students' test anxiety. Moreover, the finding also revealed that there is a significant difference in the test anxiety mean reduction scores of secondary school students treated with progressive muscle relaxation technique when compared to that of the control group. This finding is in agreement with the finding of [19], [10] and [1]. Findings from the studies showed that the degree of anxiety improvement was significantly higher in the progressive muscle relaxation training group than in the control group after progressive muscle relaxation training treatment. The fact that there was a significant difference in the post-test of these adolescents exposed to PMR treatment techniques were much expected. This is because in PMR programme, muscles are exercised progressively. So, there is a complete change in the chemistry of the body organs and better atonement of the mind for better responses to reality of life situation, including testing situations. In regard to the above premise however, the fact that the finding indicated that PMR is not effective in handling test anxiety was not expected.

**Table 3. ANCOVA on the posttest test anxiety mean scores of students treated with progressive muscle relaxation technique and those who received conventional counselling**

Source of variation	SS	df	MS	cal.F	crit.F	P>0.05
Corrected Model	501.122	2	250.561			
Intercept	140.629	1	140.629			
Pretest	285.258	1	285.258			
Treatment Model	294.606	1	294.606	10.61	4.00	Significant
Error	1527.309	55	27.769			
Total	92681.000	58				
Corrected total	2028.431	57				

**Table 4. ANCOVA on the posttest test anxiety mean scores of male and female students treated with progressive muscle relaxation technique**

Source of variation	SS	df	MS	cal.F	crit.F	P>0.05
Corrected Model	151.413	2	75.707			
Intercept	414.284	1	414.284			
Pretest	70.961	1	70.961			
Treatment Model	104.093	1	104.093	2.58	3.97	NS
Error	3112.587	77	40.423			
Total	112784.000	80				
Corrected total	3264.000	79				

## 5. CONCLUSIONS

Test anxiety is a problem to many students. Also adolescents who suffer from test anxiety tend to be consumed with feelings of anxiousness, worthlessness and absolute dread in regard to their academic achievement. This study therefore investigated the effects of progressive muscle relaxation technique on test anxiety among secondary school adolescents. Findings from the study revealed that, although there was a reduction in the study participants' level of test anxiety, PMR technique is not effective in treating test anxiety of the participants. Also findings from the study revealed that PMR technique reduced the male secondary students test anxiety more than the female. Although the finding showed a meaningful reduction in the level of students' test anxiety, it however did not prove to be effective. This is because the post-test mean score of the study participants is above the TAI norm.

## 6. RECOMMENDATIONS

Based on the finding of the study, the following recommendations are made:

1. Since the technique progressive muscle relaxation (PMR) was found not to be effective, but reduced the anxiety level of students, guidance counsellors should seek for more effective counselling techniques in helping clients, especially adolescents in overcoming their test anxiousness in counselling. If PMR should be used at all, it should be used alongside other techniques proven to have been effective on students' text anxiety.
2. Guidance Counsellors and teachers in schools should explore through seminars and workshops, more effective counselling techniques to use in treatment of students with test anxiety; this will go a long way to enhance excellent academic performance among students.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Ranjita L, Sarada N. progressive muscle relaxation therapy in anxiety: A neurophysiological study. Journal of Dental and Medical Sciences (IOSR-JDMS). 2014;(13)2:25-28. Available:[www.iosrjournals.org](http://www.iosrjournals.org)
2. Anxiety Disorder Association of America (ADAA, 2012). "Test Anxiety". (Retrieved 26 April, 2015) Available:[www.apa.org](http://www.apa.org)
3. Kendra C. Causes of test anxiety. The New York Times Company; 2012. (Retrieved 26 January 2015)
4. Birjandi P, Alemi M. The impact of test anxiety on test performance among Iranian EFL learners' brain. Broad Research in Artificial Intelligence and Neuroscience. 2010;1(4):45-68.
5. De Phil MB, Brilot B, Nettle D. Anxiety: An evolutionary approach. Canadian Journal of Psychiatry. 2011;56(12):707-715.
6. Putwain DW, Woods KA, Symes W. Personal and situational predictors of test anxiety of students in post-compulsory education. British Journal of Educational Psychology. 2010;80:137-160.
7. Eysenck MW, Derakshan N, Santos R, Calvo MG. Anxiety and cognitive performance: Attentional control theory. Emotion. 2007;7:336-353.
8. Patel P. A study to assess the effectiveness of progressive muscle relaxation therapy on stress among staff nurses working in selected hospitals at Vadodara City. Journal of Nursing and Health Science. 2014;3(3). Available:[iosrjournals.org](http://iosrjournals.org)
9. Georgiev A, Probst M, De Hert M, Genova V, Tonkova A, Vancampfort D. Acute effects of progressive muscle relaxation on State anxiety and subjective well-being in chronic Bulgarian patients with schizophrenia. Psychiatria Danubina. 2012;24(4):367-372.
10. Navaneethan B, Soundararajan R. Effect of progressive muscle relaxation training on competitive anxiety of male inter-collegiate volleyball players. International Journal of Sports Science and Engineering. 2010;4(3):161-164.
11. Vancampfort D, Correll CU, Scheewe TW, Probst M, De Herdt A, Knapen J, De Hert M. Progressive muscle relaxation in persons with schizophrenia: A systematic review of randomized controlled trials; 2012.
12. Besnrstein D, Carlson C. Progressive relaxation. Abbreviated methods. In Lehrer P & Woolfolk R (eds): Principles and



- Practice of Stress Management. 1993;53-87. Guilford Press.
13. Jacobson E. Progressive relaxation. Chicago: University of Chicago Press; 1938.
  14. Bernstein D, Borkovec T. Progressive relaxation training. Research Press, Champaign, IL; 1973.
  15. Tomlin A. Progressive muscle relaxation may help reduce anxiety in schizophrenia; 2012. (Retrieved on 24<sup>th</sup> December, 2014) Available:<http://www.thementalelf.net/>
  16. Larson HA, El Ramahi MK, Conn SR, Estes LA, Ghibellini AB. Reducing test anxiety among third grade students through the implementation of relaxation techniques. New York: Eastern Illinois University Press; 2010.
  17. Conrad A, Roth WT. Muscle relaxation therapy for anxiety disorders: It works but how? *Journal of Anxiety Disorder*. 2007;21:243-64.
  18. Hawkins RC, Doell SR, Lindseth P, Jeffers V, Skaggs S. Anxiety reduction in hospitalized schizophrenics through thermal biofeedback and relaxation training. *Percept & Mot Skills*. 1980;51: 475-82.
  19. Cheung UL, Molassiotis A, Chang AM. The effect of progressive muscular relaxation on anxiety and quality of life after stoma surgery in colorectal cancer patients. *Psychooncology*. 2003;12:254-66.
  20. Mychailyszyn MP, Mendez JL, Kendall PC. School functioning in youth with and without anxiety disorders: Comparisons by diagnosis and comorbidity. *School Psychology Review*. 2010;39(1):106-121.
  21. Ozsivadjian A, Knott F, Magiati I. Parent and child perspectives on the nature of anxiety in children and young people with autism spectrum disorders: A focus group study. *Autism: The International Journal of Research & Practice*. 2012; 16 (2):107-121
  22. Dombeck M, Wells-Moran J. Self-Soothing Techniques: Distraction; 2014. (Retrieved on 1<sup>st</sup> March, 2015) Available:<http://www.sevencounties.org/>
  23. Onyekuru BU, Ibegbunam JO. Relationships among test anxiety, locus of control and academic achievement among college students. *European Scientific Journal*. 2014;10(13):120-128.
  24. Zondi L. The effect of breathing techniques on test anxiety among students at the University of Zululand; 2013. (Retrieved on 22<sup>nd</sup> January, 2015)
  25. Nwogu BC. Educational Research: Basic issues and methodology. Enugu: University Publishers; 2015.
  26. Spielberg CD. 'Anxiety as an Emotional State' in C. D. Spielberg (ed.) *Anxiety: Current trends in theory and research*. New York: Academic Press; 1972.
  27. Hui PN, Wan M, Chan WK, Yung PM. An evaluation of two behavioural rehabilitation programs, qigong versus progressive relaxation, in improving the quality of life in cardiac patients. *Journal of Alternative and Complementary Medicine*. 2006;12(4):373-378.

## APPENDIX

### Test Anxiety Inventory (TAI)

**School:** \_\_\_\_\_ **Class:** \_\_\_\_\_

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Gender:** Male  Female

**Directions:** A number of statements which people have used to describe themselves are given below. Read each statement and then tick the appropriate box to the right of the statement to indicate how you generally feel. There is no right or wrong answers. Do not spend much time on any one statement but tick the response which describes how you generally feel.

S/N	Items	1	2	3	4
		Almost never	Sometimes	Often	Almost always
1	I feel confident and relaxed while taking tests				
2	While taking examinations I have an uneasy, upset feeling				
3	Thinking about my grade in a subject interferes with my work on tests				
4	I freeze up on important exams				
5	During exams I find myself thinking about whether I will ever get through school				
6	The harder I work on taking a test, the more confused I get				
7	Thoughts of doing poorly interfere with my concentration on tests				
8	I feel very jittery when taking an important test				
9	Even when I am well prepared for a test, I feel very nervous about it				
10	I start feeling very uneasy just before getting a test paper back				
11	During tests, I feel very tense				
12	I wish examinations did not bother me so much				
13	During important tests, I am so tense that my stomach gets upset				
14	I seem to defeat myself while working on important tests				
15	I feel very panicky when I take an important test				
16	I worry a great deal before taking an important examination.				
17	During tests, I find myself thinking about the consequences of failing				
18	I feel my heart beating very fast during important tests				
19	After an exam is over, I try to stop worrying about it, but I just can't				
20	During examinations, I get so nervous that I forget facts I really know				

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