



# Effect of a School-Based Intervention on Experience of Exam Anxiety Among Eighth Grade Students

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## Abstract:

*Students are regularly faced with high stakes tests and classroom-based assessments to determine if they are meeting grade level educational standards. Test anxiety has become a topic of concern for researchers, educators, and mental health practitioners. The construct of test anxiety can be defined as the experience of marked psychological distress when faced with evaluative situations (McDonald, 2001). Present study focuses on the impact of school-based intervention on experience of exam anxiety among eighth grade students. Teachers were trained to teach MRTs, maintain a positive classroom and parent's involvement to cope with test anxiety among the students of the eighth class. The Test Anxiety Inventory for Children and Adolescents (TAICA), developed by Patricia A Lowe and Steven Lee in 2007, has been used for the assessment of test anxiety (it can be used with children and adolescents in Grades 4 through 12). It is a 45-item self-report measure which consists of four sub scales. Results clearly indicate that PMR, positive classroom environment and time and task management help reduce exam anxiety among eighth class students. Further, it also clarifies that gender differences exists for exam anxiety, in comparison to male students female students experience higher levels of exam anxiety.*

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**Keywords:** *Test anxiety, PMR, Education, Teaching, Time Management, Parents' Involvement, Teachers' Role, Classroom Learning Skills, etc.*

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## 1. Introduction

Virtually in all middle schools within the India today, children are expected to meet educational standards to determine if they are adequately learning grade level material. Student achievement in the classroom can be measured in a variety of ways, including in-class activities, homework assignments, and classroom tests. Regarding testing, schools and teachers generally focus their resources on teaching students the essential academic content that they are expected to know in order to meet educational standards. While this is a crucial component of educating children, it also is important to address the psychological impact of school-based evaluations and how individuals within the schools, particularly teachers, can address this factor. Middle school students in the India spend approximately 30 hours a week at school and as a result, teachers play an essential role in preventing, identifying, and intervening with student anxiety (Casbarro, 2005).

The experience of test taking and other performance-based evaluations may cause significant anxiety for some children (Kruger, Wandle, & Struzziero, 2007; Putwain, 2009). Anxiety surrounding evaluative situations is known as test anxiety. Test anxiety can be triggered by situations like classroom-based and high-stakes testing, school presentations, classroom discussions, school plays and performances, and sporting events, to name a few. Test anxiety refers to the set of phenomenological, physiological, and behavioral responses that accompany concern about possible negative consequences or poor performance on an examination or a similar evaluative situation (Zeidner, 1998; McDonald, 2001). Test-anxious behavior is typically evoked when a student believes that his/her intellectual,

motivational, and social capabilities are taxed or exceeded by demands stemming from the test situation. Evidence of anxiety disorders in preschool aged children has been found, with rates of up to 10% reportedly occurring in children aged two through five (Egger & Angold, 2006). Spielberger (1966), one of the seminal researchers on the topic of test anxiety, described the phenomenon as an 'ego threat' including fear of judgment, damage to self-esteem, and negative outcomes of testing.

## 2. Components of Exam Anxiety

Zeidner (1998) outlines **three components of test anxiety**:

- a) **Cognitive** - The negative thoughts and depreciating self-statements that occur during assessments (e.g. 'If I fail this exam my whole life is a failure') and the performance-inhibiting difficulties that may arise from anxiety (e.g. recalling facts and difficulty in reading and understanding questions)
- b) **Affective** - The person's appraisal of their physiological state (such as tension, tight muscles and trembling)
- c) **Behavioural** - Poor study skills, avoidance and procrastination of work.

## 3. Causes of Test Anxiety

Fear of failure, lack of preparation, poor test history, lack of competence (Putwain & Daniel, 2009) and self-efficacy (Ferraro, 2005).

## 4. Consequences of Test Anxiety

### 4.1 *There are several outcomes*

- It can decrease motivation, achievement, self-esteem, and test performance (Hancock, 2001).
- Make false beliefs about self-potentials and can perpetuate cycle of anxiety and poor achievement.
- It can have social and emotional implications, including heightened worry, emotionality, and nervousness (Sena et al., 2007),
- It may be associated with clinical symptoms of depression and anxiety disorders (Putwain et al., 2021)

### 4.2 *Teachers Can Help Students Deal with Anxiety*

The impact of test anxiety is substantial, affecting the emotional and academic well-being of thousands of school-aged children each year. Teachers are on the front lines, serving as the primary educators and mentors for students throughout their formative early academic years and strong student-teacher relationships have been shown to enhance academic performance as well as social adjustment in students (Wentzel, 2002). Teachers are in the unique position to address test anxiety through classroom-based strategies and affect positive change in their students (Casbarro, 2005).

### 4.3 *Recognizing Symptoms of Test Anxiety*

There are several clues to look for when identifying a test anxious child:

- **Physiological Changes** in body temperature, increased breathing rate, muscle tenseness, shakiness, upset stomachs and nausea, headaches, faintness, dizziness, heart palpitations, chest tightening, and changes in eating patterns (Bodas et al., 2008; Casbarro, 2005).
- **Emotional Mood changes** like sullenness or oversensitivity, sadness, anger, frustration, nervousness, confusion, and fatigue (Sena et al., 2007; Weems et al., 2010).
- **Cognitive Irrational and negative self-statements** about one's ability or performance (e.g., "I'm no good at this), reduced self-esteem, feeling of failure, reduced processing speed, difficulty remembering and concentrating (Peleg, 2009; Putwain & Daniels, 2009; Wong, 2008). The kids feel the stress . . . They worry. They say, 'I'm scared. I don't want to take this.' Some of them don't sleep because they're so worried, and they cry. In nutshell - students are scared that they're gonna fail.

## 5. Methodology

### 5.1 *Sample*

Sample for the present research comprises of students and teachers:

**1. Students** - a sample of eighty (N= 120) students (both male and female) of eighth class from Satya Bharti Adarsh Senior Secondary School, Chogawan (Amritsar, Punjab) were selected for the purpose of the present study. Student participants were contacted directly through a private school Principal. When the topic of the research project was discussed with Principal of the private school she agreed to support for the same.

**2. Teachers** – Teacher participants were contacted directly through a private school Principal. When the topic of the research project was discussed with Principal of the private school she agreed to support for the same. Teachers teaching Eighth class students were contacted and trained for Muscles Relaxation techniques and making class room positive one. Further, it was also discussed with teacher participants that how exam anxiety affects academic performance of the students. Further, students and parents were also informed about the research project and they agreed for the same.

## 5.2 Psychological Tool

**The Test Anxiety Inventory for Children and Adolescents (TAICA)**, developed by Patricia A Lowe and Steven Lee in 2007, will be used for the assessment of test anxiety (it can be used with children and adolescents in Grades 4 through 12). The TAICA is a 45-item self-report measure which consists of four sub scales (Cognitive Obstruction/Inattention, Physiological Hyper-arousal, Social Humiliation and Worry) a Performance Enhancement/Facilitation Anxiety scale and a Lie scale. Those individuals who are being assessed rate their responses on a 5-point Likert - type scale ranging from 1 (never true about me) to 5 (always true about me).

### 5.2.1 Reliability

Lowe and colleagues (2005) reported coefficient alphas and test score stability coefficients (1-3 week test-retest interval) ranging from .81 to .95 and .81 to .90, respectively, for the TAICA scores.

### 5.2.2 Validity

Lowe et al. (2004) also found moderate to strong validity coefficients ( $r_s = .46$  to  $.77$ ) between the TAICA test anxiety scores and scores of the Test Anxiety Inventory (Spielberger, 1980).

## 5.3 Intervention Plan

Teachers were trained for fifteen days for the following techniques and then teachers implemented the same in the classroom. Parents were also incorporated in the study plan and they cooperated well.

### 1. Progressive Muscle Relaxation (PMR)

Teachers can lead students in a **progressive muscle relaxation** activity prior to a test or as part of a regular relaxation regimen. **Practice progressive muscle relaxation**, which involves tensing and relaxing each muscle in the body:

- Tense each muscle for 5 seconds and relax for 10 seconds.
- Extend your arms in front of you and clench your fists.
- Extend your arms in front of you and point your fingers to the ceiling as though you are pushing on a wall.
- Touch your fingers to your shoulders so as to tense your arm muscles (biceps).
- Shut your eyes tightly and mush your eyes, forehead, and nose together
- Clench your teeth together and make a big smile like you are trying to make the sides of your mouth touch your ears.
- Put your chin to your chest and at the same time try to pull your head back
- Take a deep breath and scrunch your shoulders up to your ears
- Suck your stomach in like you want it to touch your back bone
- Extend your legs in front of you and lift your heels off the floor and tighten your thigh muscles.
- With your legs still extended, flex your feet so that your toes are pointing to the ceiling.
- With your legs extended and your heels resting on the floor, point your toes forward (only hold for three seconds to avoid cramping)

- Take 5 deep breaths and relax (Casbarro, 2005; Feldman, et al., 2010; Matheny, 2009; Tenenbaum et al., 2010)

Teachers' participants were encouraged to directly teach and practice relaxation strategies with their students on a regular basis so that they feel comfortable using relaxation in evaluative situations that make them feel anxious. Incorporating relaxation into the classroom routine will provide students with another tool to use when faced with a stressful situation, like a test.

## 2.Strategies for the Classroom

### Creating a positive classroom environment

- **Discussions** – encourage students to discuss new concepts in small groups to enhance shared learning.
- **Role plays** – role plays can encourage students to work as a team while helping them enhance their understanding of stories and lessons (Ioannou & Artino, 2010).

## 6. Directly teach good study habits

- Study in a quiet place with limited distraction.
- Develop a study plan and ask family for help.
- Organize assignments by subject.
- Study for 15-20 minutes before taking a break.
- Time management – schedule enough time, take breaks, vary what is studied.
- Reward yourself for a good study session (e.g., a game/snack break).
- Provide students with practice tests when possible (Casbarro, 2005).

## 7. Classroom Learning Skills

- **Note taking** – using abbreviations, listening for key words, paying attention to the teacher's voice and inflection, watching the teacher, reviewing notes.
- **Memory strategies** – use rhymes and songs, pictures and other visual aids, mnemonic devices, and acronyms.
- **Deep breathing** can help reduce test anxiety (Paul et al., 2007), and is quick and easy to implement in the classroom.

**3.Teach visualization strategies** - Encourage children to relax while visualizing a peaceful place. Teachers can provide and describe examples to help children conceive of their own peaceful place (e.g., bedroom, grandma's house, the beach, on a boat). Children can make their peaceful place concrete by drawing or painting a representation of it (e.g., Casbarro, 2005).

**4.Incorporating physical activity** - There are several ways that middle school teachers can incorporate physical activity into their daily routine, like as recess, physical education class or even a brief break. In addition to regular recess and playground time, teachers can add brief exercise activities, like a jumping jack break, during the regular day.

**5.Parents' involvement** - The intervention also included teaching parents about **PMR** and creating positive and peaceful environment at home to help their children.

## 8. Result and Discussion

This piece of work is an effort to understand the effect of school-based intervention on exam anxiety experienced by 8<sup>th</sup> grade students in which teachers played role of facilitators. In present study, for Pre (Minor 1, when intervention was not applied) and Post (Minor 2 after two months of minor 1, when intervention was applied) intervention comparisons the paired-samples t-tests was employed to determine if significant change had occurred from one time period to the next. Further, for gender differences independent-samples t-tests was employed.

### 8.1 Pre and Post Intervention

Table 4.1 gives a clear picture of the findings. The results show that Pre intervention (M=18.4, SD= 6) in comparison to Post intervention (M = 12.61, SD = 5.91) exhibited significantly higher Cognitive Obstruction/Inattention scores,  $t(79) = 6.149$ ,  $p < 0.01$  (proves hypothesis I), Pre intervention (M = 22.4, SD = 8.07) in comparison to Post intervention (M = 17.71, SD = 9.51) exhibited significantly higher Social Humiliation scores,  $t(119) = 3.363$ ,  $p < 0.01$  (proves hypothesis II), Pre intervention (M = 17.62, SD = 6.50) in comparison to Post intervention (M = 11.30, SD = 6) exhibited significantly higher Physiological Hyperarousal scores,  $t(119) = 6.3903$ ,  $p < 0.01$  (proves hypothesis III), Pre intervention (M = 21.03, SD = 5.04) in comparison to Post intervention (M = 17.70, SD = 6.34) exhibited significantly higher Worry scores,  $t(119) = 3.677$  (proves hypothesis IV),  $p < 0.01$ . Further, Pre intervention (M = 15.6, SD = 5.0) in comparison to Post intervention (M = 12.01, SD = 6.12) have significantly higher Performance Enhancement/Facilitation Anxiety scores,  $t(119) = 4.063$ ,  $p < 0.01$  (proves hypothesis V), Pre intervention (M = 72.39, SD = 20.44) in comparison to Post intervention (M = 63.33, SD = 21.19) showed significantly higher Total Test Anxiety scores,  $t(119) = 2.7524$ ,  $p < 0.01$  (proves hypothesis VI). There is no significant difference between Pre intervention (M = 16.31, SD = 4.31) Post intervention (M = 17.44, SD = 5.41) for Lie scores,  $t(119) = 1.4612$ ,  $p > 0.05$ .

Variable	Pre		Post		t-value
	M	SD	M	SD	
<b>Cognitive Obstruction/ Inattention</b>	18.4	6.00	12.61	5.91	<b>6.1491**</b>
<b>Social Humiliation</b>	22.4	8.07	17.71	9.51	<b>3.3633**</b>
<b>Physiological Hyperarousal</b>	17.62	6.50	11.30	6.00	<b>6.3903**</b>
<b>Worry</b>	21.03	5.04	17.70	6.34	<b>3.6774**</b>
<b>Performance Enhancement/Facilitation Anxiety</b>	15.6	5.00	12.01	6.12	<b>4.0631**</b>
<b>Lie</b>	16.31	4.31	17.44	5.41	1.4612
<b>Total Test Anxiety</b>	72.39	20.44	63.33	21.19	<b>2.7524**</b>

\*\* Significant at 0.01 level of significance

On comparing the means (Table 4.1) of the two conditions (Pre and Post intervention) it becomes clear that students in Pre intervention have high mean of the four domains (Cognitive Obstruction/Inattention, Physiological Hyperarousal, Social Humiliation and Worry) of and total score of TAICA, whereas in Post intervention condition the mean is low for four domains of and total score of TAICA. Further, it can be inferred from the result findings that teachers can help students deal with exam anxiety by creating a positive environment in the class room, helping students manage their time and organise their school related tasks, and by acting as facilitator – facilitator for progressive muscle relaxation (PMR). Results confirmed that PMR, positive classroom environment and time and task management can lower down exam anxiety. It has also been found in different researches that performing progressive muscle relaxation method was effective in reducing test anxiety (O'Donnell & Dunlap, 2019; Zargazadeh & Shirazi, 2014).

### 8.2 Gender Differences

Results for gender difference on TAICA have been presented in Table 4.2. The results show that Pre intervention (M = 15.44, SD = 4.91) in comparison to Post intervention (M = 13.33, SD = 5.66) exhibits significantly higher Cognitive Obstruction/Inattention scores,  $t(118) = 2.1861$ ,  $p = 0.0308$ , Female students (M = 14.40, SD = 5.44) in comparison to Male students (M = 20.62, SD = 5.92)



significantly have higher Physiological Hyperarousal scores,  $t(118) = 5.988$ ,  $p < 0.01$  and Female students ( $M = 13.90$ ,  $SD = 7.00$ ) scored significantly higher than Male students ( $M = 21.02$ ,  $SD = 6.04$ ) on Worry domain,  $t(118) = 5.892$ ,  $p = 0.0013$ . On Total Test Anxiety Female students ( $M = 61.66$ ,  $SD = 23.33$ ) in comparison to Male students ( $M = 72.98$ ,  $SD = 20.83$ ) scored significantly higher scores,  $t(118) = 2.775$ ,  $p = 0.0064$ . Further, there is significant difference between Male students and Female students for Social Humiliation scores,  $t(118) = 3.196$ ,  $p = 0.0018$ , Whereas there is no significant difference between Male students and Female students for Performance Enhancement/Facilitation Anxiety scores,  $t(118) = 0.021$ ,  $p = 0.521$  and Lie scores,  $t(118) = 0.708$ ,  $p = 0.4805$ .

**Table 4.2. Showing Means (M) and Standard Deviations (SD) for the Male and Female students and t-values of Test Anxiety Inventory for Children and Adolescents (TAICA) (N=120, 64 Male and 56 Female)**

Variable	Male		Female		t-value
	M	SD	M	SD	
<b>Cognitive Obstruction/ Inattention</b>	15.44	4.91	13.33	5.66	<b>2.186*</b>
<b>Social Humiliation</b>	19.04	8.03	14.37	7.88	<b>3.196**</b>
<b>Physiological Hyperarousal</b>	14.40	5.44	20.62	5.92	<b>5.988**</b>
<b>Worry</b>	13.90	7.00	21.02	6.04	<b>5.892**</b>
<b>Performance Enhancement/Facilitation Anxiety</b>	14.03	5.20	14.01	5.12	0.021
<b>Lie</b>	18.33	5.11	19.00	5.22	0.708
<b>Total Test Anxiety</b>	61.66	23.33	72.98	20.83	<b>2.774**</b>

\*Significant at 0.05 level of significance  
\*\* Significant at 0.01 level of significance

Results of present study are in accordance with previous research. Although, there is no significant difference between male and female students for social humiliation which indicates that both male and female students feel equally socially humiliated. There are many explanations which have been reported for the gender differences in the literature, with differences in socialization patterns and in child-rearing for women and men (Maccoby & Jacklin, 1974) being the most prominent ones. According to these views, women are socialized to express and acknowledge their feelings, including feelings of anxiety, whereas men are encouraged to hide, deny, or repress their feelings. On the basis of these views, women would be more willing to admit anxious feelings on measures of test anxiety than men because it would be more socially acceptable to do so. Gender differences have been examined on test anxiety measures (Harpell & Andrews, 2012; Lowe et al., 2011) which suggest females score consistently higher than males on test anxiety measures.

## 9. Conclusion

On the basis of results and discussion, it can be concluded that PMR, positive classroom environment and time and task management help reduce exam anxiety among eighth class students. Further, it also clarifies that gender differences exists for exam anxiety, in comparison to male students' female students experience higher levels of exam anxiety.

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