

Empowering Adolescents: Exploring the Relationship between Self-Esteem and Test Anxiety

Abstract

Background: Test anxiety is a major cause of student non-performance, despite adequate preparation. This paper is part of a multi-centric youth behavior study project done in 2022 by the Association of Adolescent and Child Care in India (AACCI). Aims: to study self-esteem and test anxiety in school children.

Methods: The tools used were RSES- Rosenberg Self-esteem Score (scores >25 are considered high self-esteem and FTAS- Freidben Test Anxiety Scale (scores > 7 are considered significant).

Sample: 242 students (10-18 years) studying in a coaching class in Aurangabad (males 53.31%, females 46.69%).

Validity & reliability: The RSES - Guttman scale coefficient of reproducibility is 0.92, indicating excellent internal consistency. Test-retest reliability over 2 weeks reveals correlations of 0.85 and 0.88. FTAS- the internal consistency (Cronbach's alpha) of the total and the three sub-scales of the FTA (range: .81-.91 validity, 0.82 (girls) and 0.84 (boys). It has also been shown to be significantly correlated with peer evaluations of the degree to which test-related stress is experienced (Total: 0.54; Fear of Social Derogation: 0.52; Cognitive Obstruction: 0.64; and Tenseness: 0.78).

Ethical issues: This project has been cleared by the AACCI IEC. Parental permission and assent of students were taken.

Statistical analysis was done using t-test/ANOVA by GNU PSPP.

Results: Analysis of our data showed that this sample had significant mean test anxiety scores: total FTAS (9.19±5.37). SD-Social Derogation (3.84±2.61), CO-Cognitive Obstruction (2.46±2.17), and T-Tenseness (2.88±1.95). Females showed higher scores - total FTAS (10.23±5.10) and SD (4.40±2.54). A strong correlation was found between FTAS score and SD factor across all ages with the strongest positive correlation coefficient for early adolescent female students $r(24) = .92, p < .001$.

Conclusion: Females had higher test anxiety scores, and lower self-esteem scores and will need specific intervention. Being judged by marks affects the self-esteem of adolescents. SD factor was significant across ages in this sample. AACCI conducts awareness programs for parents and teachers to reduce social pressure on children given high SD scores. We also conduct intervention programs for improving CO scores by instilling good study skills and habits and relaxation and stress relief methods to reduce T scores in the context of test anxiety.

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Introduction

This paper aims to study self-esteem and test anxiety, employing the Freidben Test Anxiety Scale (FTAS) as a metric for test anxiety and Rosenberg's Self-esteem Scale (RSES) to gauge self-esteem. By utilizing these validated instruments, we aim to unravel the complexities of this relationship and contribute to a more comprehensive understanding of the psychological factors influencing students' experiences in academic settings. Insights derived from this research may inform the development of targeted interventions that cater to the unique needs of students, promoting mental well-being and optimizing academic performance.

Test Anxiety (TA) or examination anxiety is a multifaceted phenomenon encompassing cognitive, physiological, and behavioural responses triggered by concerns about potential failure or subpar performance in evaluative situations, such as exams.¹

TA stands out as a significant impediment to academic success, even in cases where students have adequately prepared for

examinations. The Freidben of Test Anxiety Scale (FTAS), a well-established measure in the field, provides a systematic approach to assessing the various dimensions of exam-related anxiety. There are 3 sub factors- Social Derogation, Cognitive Obstruction, and Tenseness, which provide a comprehensive framework for understanding the multifaceted nature of TA.¹

Social derogation is perceived judgment and evaluation by others. Anticipating external judgment significantly increases anxiety and affects students' emotional states during exams² making parents and teachers aware of reducing social pressures on children to achieve better results is very crucial.

Cognitive obstruction, a sub-factor of TA, disrupts essential cognitive processes crucial for effective task performance. Students experiencing this obstruction may face challenges in clear thinking, information recall, and knowledge application due to heightened anxiety. This sub factor underscores anxiety's impact on cognitive functioning, potentially impeding optimal academic performance.³

Intervention programs to teach better study habits, time management, and exam skills will overcome this issue.

Tenseness encompasses the physiological and emotional aspects of EA, reflecting the heightened arousal and tension experienced by individuals during exams. This subfactor captures the physical manifestations of anxiety, such as increased heart rate, muscle tension, and overall discomfort. Tenseness sheds light on the somatic responses that contribute to the overall experience of EA.⁴ Teaching adolescents to relax during examinations and to practice this while preparing will help alleviate anxiety.

Understanding these sub factors is instrumental in tailoring interventions and support systems that address the specific dimensions of EA that students may be grappling with. Positive self-esteem stands as a cornerstone for adolescent development, serving as a potent catalyst for self-confidence and resilience.⁵ In the intricate journey of adolescence, where identity is shaped and challenges abound, a robust sense of self-worth becomes a formidable asset. This heightened self-regard empowers adolescents to face challenges confidently and acts as a protective shield against high-risk behaviors.⁶

Rosenberg's Self-Esteem Scale (RSES), is a set of 10 questions scale which emerges as a valuable tool in this pursuit. This instrument offers a structured assessment, delving into the intricate layers of self-perception.^{7,8}

Background

AACCI - Association of Adolescent and Child Care in India founded in 2007 has been conducting multicentric research on various aspects of youth behavior in India using standardized validated psychometric tools. The data is collected from various schools during the awareness programs conducted by AACCI and the results are shared with the school management and parents. This motivates them to permit AACCI to plan intervention programs in the school. In India, there is intense cutthroat competition for various entrance exams. This leads to tremendous academic pressure and intense examination anxiety. It also affects the self-esteem of students, because their work is decided by the marks they get. AACCI has been conducted multi-centric studies on exam anxiety to find self-esteem over the last many years. The results of our older papers have been shared in the discussion section of this paper. Exam anxiety has many aspects or factors and needs to be dealt with at all levels. AACCI conducts intervention programs to teach children:

- 1) Good study habits and examination skills to improve cognitive skills and memory for better exam performance;
- 2) Constructive stress management techniques to control anxiety before and during exams;
- 3) Guidance for parents and teachers to reduce societal and school pressures that contribute to exam anxiety and lower self-esteem and self-confidence.

Methodology

Sample: We used the convenience sampling method. The study comprised $n = 242$ students, aged between 10 to 18 years (with a median age of 15.9 years), enrolled at Dnyandeep Foundation Centre (DFC), a coaching institution located in Aurangabad, Maharashtra.

Procedure: The data was facilitated with the supervised filling of the questionnaires through the Google form link in April 2022. Parental consent and assent of students were taken. Management employed a systematic approach to secure parental consent to initiate the

study. A Google form link was disseminated to parents, offering a comprehensive explanation of the survey's purpose and objectives through email. Subsequently, students participated in the survey only after obtaining explicit parental permission. To safeguard participant confidentiality, the survey intentionally refrained from requesting personal identifiers such as names, instead focusing on collecting age and gender information.

Duration of study One month, April 2022

Inclusion-exclusion criteria:

Only students between ages 10-18 years of age from DFC coaching classes were included. There were no exclusion criteria

Demographic variables:

We studied the relationship between the scores of test anxiety and self-esteem as related to the following demographic variables—age, gender, school, family structure, birth order, number of siblings, parental education, and profession, to see which of these factors had an impact on test anxiety and self-esteem.

Tools used

1. RSES is used to measure self-esteem. The RSES scale has 10 questions each scored between 1 and 4, thus having a minimum score of 10 indicating low self-esteem and a maximum score of 40 indicating high self-esteem. (7) It demonstrates a Guttman scale coefficient of reproducibility of 0.92, indicating excellent internal consistency. Test-retest reliability over 2 weeks reveals correlations of 0.85 and 0.88, indicating excellent stability. It demonstrates concurrent, predictive, and construct validity using known groups. It also correlates significantly with other measures of self-esteem, including the Coopersmith Self-Esteem Inventory.⁹
2. FTAS is used to estimate Test Anxiety. The FTAS is a scale of 23 questions each scored between 0 and 1, thus having a minimum score of 0 indicating the absence of test anxiety, and a maximum score of 23. Total score of 7 and above indicates significant anxiety. The scale has 3 components or factors – 8 questions covering “Social Derogation”, 9 questions covering “Cognitive Obstruction” and 6 questions covering “Tenseness”.^{10,11}

The internal consistency (Cronbach's alpha) of the total and the three sub-scales of the FTA has proved satisfactory (range: .81-.91). In terms of validity, the FTAS shows correlations of 0.82 (girls) and 0.84 (boys) with the Test Anxiety Inventory. It has also been shown to be significantly correlated with peer evaluations of the degree to which test-related stress is experienced (Total: 0.54; Fear of Social Derogation: 0.52; Cognitive Obstruction: 0.64; and Tenseness: 0.78).¹²

Statistical analysis

It was done using t-test/ANOVA by GNU PSPP.

Results

Discussion

Age and gender distribution:

Table 1 shows a balanced gender distribution across adolescent stages in the coaching class, with slightly more males in this cohort. The majority fall within the mid-adolescence stage (14-16 years). The mean age is 15.97 years, indicating a typical adolescent cohort.¹³

Table 1 Age and gender distribution of Aurangabad coaching class students (n=242)

Adolescence stage	Male no. (%)	Female no. (%)	Total no. (%)
Early 10-13 yrs	28 (53.85%)	24 (46.15%)	52 (21.49%)
Mid 14-16 yrs	75 (52.82%)	67 (47.18%)	142 (58.68%)
Late 17-19 yrs	26 (54.17%)	22 (45.83%)	48 (19.83%)
Total	129 (53.31%)	113 (46.69%)	242 (100.0%)

Age range 10-18 yrs median age IQR – 15(8) mean Age 15.97 (SD 1.62)

Self-esteem scores of Aurangabad coaching class students

Table 2 data shows that students from our Aurangabad coaching class generally possess positive self-esteem, as evidenced by a mean score of 28.37. The narrow range of scores, spanning from 15 to 38, further supports this notion. Only 14.46% of students showed low self-esteem. Overall, these findings suggest a generally positive self-esteem among the students and likelihood of a healthy environment at home and at school.

Table 2 Self-esteem scores of Aurangabad coaching class students (n=242)

Mean	28.37
Mode	29
Median	28
Std Dev	4.26
Variance	18.13
Range	23
Minimum	15
Maximum	38

Table 3 indicates a notable disparity in self-esteem levels between male and female students. While both genders show high self-esteem (56.35% males, 43.65% females), there's a higher proportion of males in this category. Conversely, females exhibit a higher percentage in the moderate self-esteem range (55.74% females, 44.26% males). Notably, there are no students categorized with low self-esteem. Overall, this suggests a predominantly positive self-esteem environment, though gender differences warrant attention and potential exploration of underlying factors influencing self-esteem perceptions.

Table 4 Demographic variables influencing RSES (Self-Esteem) scores n=242

Demographic variable	Categories	N	Mean±SD for categories	Test	Test statistic t/F/ χ^2	df	p-value
Whether both parents at the Post-Graduate Level of Education	Either one or both parents below Post Graduate Level	180	28.10 ± 4.04	t-test, Equal variances	-2.74	218	.007**
	Both parents Post Graduate Level	40	30.10 ± 4.73				
	Total	220	28.46 ± 4.24				
Whether the Mother is exclusively a homemaker	No	105	29.01 ± 4.11	t-test, Equal variances	2.16	236	0.032*
	Yes	133	27.82 ± 4.31				
	Total	238	28.34 ± 4.26				
Family structure	Nuclear family	120	28.62 ± 4.22	ANOVA	3.47	2,239	0.033*
	Three-generation family	75	28.88 ± 3.84				
	Joint family	47	26.94 ± 4.75				
	Total	242	28.37 ± 4.26				
The education level of Mother	Below Graduation	73	27.60 ± 3.41	Kruskal Wallis	6.35	2	0.042*
	Graduate	101	28.41 ± 4.59				
	Postgraduate	55	29.36 ± 4.66				
	Total	229	28.38 ± 4.26				

* P<.05 ** P<0.01 ***P<0.001

Table 3 Gender differences in self-esteem levels for Aurangabad coaching class students (n=242)

Self-esteem level	Male no. of students (%)	Female no. of students (%)	Total no. of students (%)
Low self-esteem (RSES score <15)	0	0	0
Moderate self-esteem (RSES score 15-25)	27 (44.26%)	34 (55.74%)	61 (25.21%)
High self-esteem (RSES score >25)	102 (56.35%)	79 (43.65%)	181 (74.79%)
Total	129 (53.31%)	113 (46.69%)	242 (100.0%)

Meta-analyses with a focus on self-esteem and gender differences show that males have higher self-esteem than females.¹⁴ Females tend to have more unstable self-esteem compared to males, which is consistent with many longitudinal studies. Self-esteem is influenced by various factors throughout adolescence. One study across 48 nations, consistent with previous research, found age-related increases in self-esteem from late adolescence to middle adulthood and significant gender gaps, with males consistently reporting higher self-esteem than females.¹⁵ These aspects are explored later in the discussion.

Table 4 indicates four significant points: (a) Mean RSES is higher in students when both parents have post-graduate level education (M=30.10, SD=4.73) than those students whose either one or both parents have below post-graduate level education (M=28.10, SD=4.04), $t(218)=-2.74$, $p=.007$; (b) Mean RSES score is higher in students whose mother is not homemaker (M=29.01, SD=4.11) than in students whose mother is a homemaker (M=27.82, SD=4.31), $t(236)=2.16$, $p=.03$; (c) Mean RSES is higher in students who are living with three generations of their family (M=28.88, 3.84) than that of students living in a nuclear family (M=28.62, 4.22) and of students living in a joint family (M=26.94, 4.75), $F(2, 239)=3.47$, $p=.03$; (d) Higher RSES scores is seen in students whose mothers have postgraduate level education (mean rank=130.56) than students whose mothers have graduate level education (mean rank=116.58) and whose mother's education is lower than graduate level (mean rank=101.09), $\chi^2(2)=6.35$, $p=0.042$.

This suggests that self-esteem in students is contingent on a few factors; (a) it is higher when both parents have postgraduate level of education; (b) it is higher when especially mothers have postgraduate level of education; (c) it is higher when mothers are working rather than when they are homemakers; (d) it is higher when students are living with three generations in their family than in joint or nuclear families.

Parental education and the self-esteem of students were studied before also. In Turkish schools, a study was conducted with 2,213 adolescents where self-esteem scores were assessed taking into account the educational level of the mother and the father. In this study, they found significant differences in self-esteem scores related to parental educational level i.e. parental educational level positively influences the self-esteem of Turkish adolescents. In our study also we found the same result that the students whose parents have higher educational levels have a higher self-esteem, especially mothers.¹⁶ The results from another study also revealed that the relationship between mothers and children has always been strong. The education level of mothers affects their approach to nurturing i.e. it influences children in three main ways; it promotes physical health of children, provides for good nutrition and prevents illnesses, helps children develop cognitive, adaptive and individual qualities and finally develops their science and cultural literacy.¹⁷ Yet another study examines how maternal education levels influence the development of children's self-esteem. The findings indicate that higher levels of maternal education are associated with higher self-esteem in children. The key reason is that educated mothers are more likely to engage in positive parenting practices, such as providing emotional support, encouragement, and fostering a positive self-image, which significantly contribute to the development of self-esteem in children.¹⁸ Relatively less attention has been paid to the impact of the father's education and his work. In one study, how fathers' educational levels influence children's self-esteem was explored. The findings indicate that higher levels of fathers' education are associated with higher self-esteem in children. The key reason is that educated fathers are more likely to engage in positive parenting practices, such as offering praise, providing guidance, and fostering a supportive home environment, which helps build children's self-confidence and self-worth.¹⁹ All these studies related to parental education and self-esteem suggest findings that are similar to our results i.e. higher the level of parental education, higher the child's self-esteem.

Some research has been done in the influence of working mothers and homemakers on students' self-esteem. In one study from India, the study revealed that employed mother's adolescents showed high self-concept on the dimension of social, temperamental and on total self-concept. Boys of the same group found to be high self-concept on physical and temperamental and girls on the dimension of social self-concept than the counter group. Another study confirms our result i.e. the self-concept level of the children of working mothers was found to be more than that of the children of non-working mothers. The study of Powell (1963) also indicated that adolescent and college age children of employed mothers tended to be more achievement oriented than the children of home maker mothers. Medvedova (2000) investigated the relationship between family environment, parental behaviour and self-esteem in early adolescence and found that there was positive relationship of self-esteem with cohesion, organization, expressiveness and recreational orientation in family. It is possible that working mothers have an opportunity to fulfil their aspirations both financial and professional, likely leading to better mental health at an individual level which then helps foster the child's development.²⁰⁻²² Other research show that maternal employment per se is not the

major issue in either marital relations or child development but the circumstances of the family, the attitudes and expectations of fathers and mothers, and the distribution of time available have important effects.²³ This is in line with our findings wherein children's self-esteem was found to be higher when their mothers were working as opposed to being homemakers. Some factors that play an important role in the child's self-esteem could be mother's mental health, financial independence and also the child's ability to adjust to his/her surroundings in the absence of the mother fostering the chances of being more independent in their own activities.

Our study also found that students' self-esteem was higher when living in three generations of their family i.e. with grandparents. Some research has focused on the influence of grandparents on grandchildren's self-esteem. Grandparents have a profound effect on key aspects of their grandchildren's development, including cognitive and verbal abilities, mental health, and overall wellbeing. The nurturing bond between grandparents and grandchildren is likely to influence determinants of child health, altruism and has the potential to reduce risky behaviour, including smoking and drug use among teenagers. It can also improve nutritional outcomes, reduce the likelihood of childhood obesity, and be associated with better mental health in grandchildren.²³ This is in line with our study wherein, the influence of grandparents was seen as most beneficial for children's self-esteem. In addition to the factors mentioned above, it is also likely that children feel safe and find their grandparents reliable for their needs. Grandparents also have a chance to relive their moments with their grandchildren without the responsibility of being their primary caregivers so they are able to be more free and loving.

Test anxiety and sub-factor scores:

Table 5 shows the mean FTAS score of 9.19 (scores above 7 are considered significant). Sub factor scores reveal diverse experiences, with the Social Derogation Factor (SD) (mean – 3.84) and Tenseness Factor (T) (mean – 2.88) scoring higher compared to the Cognitive Obstruction Factor (CO) (mean – 2.46). Here the 9.19 ratio which we found is significant. (Total mean scores on the FTAS > 7 are considered significant for interpretation).

Table 5 FTAS and sub-factor scores for Aurangabad coaching class students (n=242)

	Total FTAS score	Social derogation factor (SD) score	Cognitive obstruction factor (CO) score	Tenseness factor (T) score
Mean	9.19 (>7 significant)	3.84	2.46	2.88
Mode	9	0	0	1
Median	9	4	2	3
Std Dev	5.37	2.61	2.17	1.95
Variance	28.83	6.81	4.71	3.81
Range	23	8	9	6
Minimum	0	0	0	0
Maximum	23	8	9	6

Table 6 shows a consistent and noteworthy connection between different aspects of test anxiety and specific sub factors like Social Derogation (SD), Cognitive Obstruction (CO), and Tenseness (T). These correlations remain robust across various demographics, including gender and age groups, indicating a strong association. Notably, the most striking correlation is found between Total Test Anxiety and the SD sub factor, especially notable among early

adolescent female students, where it reaches an impressive correlation coefficient of $r(24)=0.92$, $p<.001$, indicating an exceptionally strong relationship. Highest negative correlation strength for female middle adolescents' $r(67) = 0.66$, $p<.001$.

Table 6 Pearson correlations between FTAS scores & Sub-factor Scores (SD, CO & T)

	N	Pearson correlations					
		Total FTAS & SD	Total FTAS & CO	Total FTAS & T	SD & CO sub-factor	SD & T sub-factor	CO & T sub-factor
Total sample	242	0.84 ^a	0.76 ^a	0.79 ^a	0.41 ^a	0.51 ^a	0.43 ^a
Male	129	0.85 ^a	0.77 ^a	0.79 ^a	0.45 ^a	0.54 ^a	0.43 ^a
Female	113	0.81 ^a	0.74 ^a	0.77 ^a	0.33 ^a	0.45 ^a	0.42 ^a
Early A Total	52	0.88 ^a	0.73 ^a	0.79 ^a	0.43 ^b	0.66^a	0.29 ^b
10-13 yrs Male	28	0.86 ^a	0.65 ^a	0.72 ^a	0.27	0.60 ^b	0.11
Female	24	0.92^a	0.80 ^a	0.84 ^a	0.60 ^b	0.72 ^a	0.46 ^b
Mid A Total	142	0.84 ^a	0.78 ^a	0.79 ^a	0.45 ^a	0.50 ^a	0.46 ^a
14-16 yrs Male	75	0.88 ^a	0.79 ^a	0.82 ^a	0.53 ^a	0.61 ^a	0.46 ^a
Female	67	0.78 ^a	0.75 ^a	0.76 ^a	0.32 ^b	0.36 ^b	0.45 ^a
Late A Total	48	0.77 ^a	0.74 ^a	0.79 ^a	0.27	0.40 ^a	0.49 ^a
17-19 yrs Male	26	0.76 ^a	0.83 ^a	0.80 ^a	0.39 ^b	0.33	0.65 ^a
Female	22	0.74 ^a	0.70 ^a	0.69 ^a	0.14	0.33	0.33
English medium	203	0.84 ^a	0.77 ^a	0.78 ^a	0.44 ^a	0.51 ^a	0.44 ^a
Marathi medium	30	0.83 ^a	0.71 ^a	0.79 ^a	0.33	0.55 ^a	0.34

a. $P<.001$ b. $P<.05$

Gender and test anxiety:

Gender differences in test anxiety have been studied previously. Previous AACCI work has also shown that females experience higher levels of test anxiety as compared to males.²⁴ Another study from a Gurgaon school also showed that female students had elevated test anxiety scores compared to males. In this cohort, we found that males (0.85) have higher test anxiety levels than females (0.81). Similar results were found in a Jaipur school, wherein the male students had higher anxiety than females. Other studies also report high test anxiety among females more than males.²⁵ For instance, in one study with medical and nursing students, the FTAS was used. Results showed more test anxiety among nursing students (more females) than medical students. In yet another study, self-report test anxiety data were collected from secondary school students wherein results showed that 16.4% of the sample reported themselves to be highly test anxious, with the proportion significantly higher in female students than male students.²⁶

Our previous studies have found that high test anxiety may be explained by students' socio-economic status and the subsequent pressure on them that shapes the "schooling experience" for the students. It must be kept in mind that the parents of these students came from a working-class background, especially those from a nuclear family, experienced an overall pressure to perform, and relatively less parental support and input when it came to cracking competitive examinations.²⁷ Another study conducted by AACCI on 93 Indian urban children and adolescents found that students of a younger age, those who are still dependent on their parents financially, and also those students who hail from middle-class, nuclear families where both parents work, are perhaps maximally stressed at the prospect of examinations.²⁸

Test anxiety and SD sub-factor:

With the FTAS, some studies have included the sub-factors in

their analyses. In a study by AACCI, while females scored higher on test anxiety than males, SD sub-factor scores were higher than CO and T scores. Another study that focused on test anxiety in Indian children from a cross-cultural perspective found that the importance of somatization and social derogation was substantiated.²⁹ In another study in Tamil Nadu, females were shown to have greater test anxiety than males. The same study also compared test anxiety to the Big Five personality traits and results showed that females have high negative emotionality compared to males i.e. score more on all three sub-factors.³⁰ In one AACCI study, the social derogation sub-score was found to be the highest amongst all sub-scores. Some reasons could be that exams and grades earned by students are highly valued. The "worth" of a student is determined using these scores as a benchmark. Faulty coping styles and excessive pressure can have lasting effects on test-taking behaviour in a high-stakes situation.³¹

Like in the studies above, a relationship between test anxiety and social derogation (SD) and possibly even tenseness (T) sub-factors do exist. One possible reason could be socio-cultural changes in that we give equal opportunities to males and females as students. This puts as much pressure on females as males to succeed. Alternatively, culturally, females have faced the threat of being withdrawn from education early and that also puts more pressure on females. High negative emotionality can also make one sensitive to criticism which can cause high anxiety and feelings of being ridiculed or belittled. On the other hand, females may also feel extremely conscientious towards their tests causing them more anxiety compared to males. These pressures combined with the pressure of being from nuclear, middle-class families where professional growth is heavily tied to academics may all be influential in high test anxiety scores.

Parent's education and test anxiety

Table 7 Some findings are as follows:

Table 7 Demographic variables influencing FTAS (Exam Anxiety) and its sub factor scores n=242

Demographic variable	Categories	N	Mean \pm SD for categories	Test	Test statistic t/F/ χ^2	df	p-value
Significant differences in mean total FTAS scores							
Respondent Gender	Female	113	10.23 \pm 5.10	t-test, Equal variances	2.87	240	0.004 ^a
	Male	129	8.27 \pm 5.45				
	Total	242	9.19 \pm 5.37				
Whether the father has completed school	Yes	213	9.00 \pm 5.24	t-test, Equal variances	2.16	222	0.024 ^b
	No	11	12.73 \pm 6.50				
	Total	224	9.18 \pm 5.36				
Whether the mother has completed school	Yes	218	9.09 \pm 5.33	t-test, Equal variances	-1.99	227	0.048 ^b
	No	11	12.36 \pm 5.07				
	Total	229	9.25 \pm 5.35				
Whether both parents have completed school	Yes	206	8.91 \pm 5.18	t-test, Equal variances	-2.39	221	0.018 ^b
	No	17	12.06 \pm 5.93				
	Total	223	9.15 \pm 5.29				
The education level of Father	Below Graduation	36	11.33 \pm 5.99	ANOVA	3.64	2,221	0.028 ^b
	Graduate	97	8.94 \pm 5.10				
	Postgraduate	91	8.59 \pm 5.20				
The education level of Mother	Below Graduation	73	10.81 \pm 5.38	ANOVA	4.95	2,226	0.008 ^a
	Graduate	101	8.73 \pm 5.09				
	Postgraduate	55	8.13 \pm 5.41				
Total	229	9.25 \pm 5.35					
Significant mean differences in mean SD sub factor scores							
Respondent Gender	Female	113	4.40 \pm 2.54	t-test, Equal variances	3.16	240	0.002 ^a
	Male	129	3.36 \pm 2.58				
	Total	242	3.84 \pm 2.61				
The education level of Father	Below Graduation	36	5.00 \pm 2.52	ANOVA	4.82	2,221	0.009 ^a
	Graduate	97	3.82 \pm 2.56				
	Postgraduate	91	3.43 \pm 2.61				
The education level of Mother	Below Graduation	73	4.64 \pm 2.50	ANOVA	4.81	2,226	0.009 ^a
	Graduate	101	3.56 \pm 2.59				
	Postgraduate	55	3.44 \pm 2.62				
Total	229	3.88 \pm 2.61					
Significant mean differences in mean CO sub factor scores							
Whether the father has completed school	Yes	213	2.38 \pm 2.13	t-test, Equal variances	-2.01	222	0.045 ^b
	No	11	3.73 \pm 2.65				
	Total	224	2.45 \pm 2.17				
Whether both parents have completed school	Yes	206	2.34 \pm 2.10	t-test, Equal variances	-2.11	221	0.036 ^b
	No	17	3.47 \pm 2.32				
	Total	223	2.43 \pm 2.13				
Significant mean differences in mean T sub factor scores							
Whether the father has completed school	Yes	213	2.81 \pm 1.92	t-test, Equal variances	-2.32	222	0.021 ^b
	No	11	4.18 \pm 1.54				
	Total	224	2.88 \pm 1.92				
Whether both parents have completed school	Yes	206	2.79 \pm 1.92	t-test, Equal variances	-2.26	221	0.025 ^b
	No	17	3.88 \pm 1.80				
	Total	223	2.87 \pm 1.93				

a. $P < .001$ b. $P < .05$

- a) Students who have scored higher mean FTAS scores are those whose fathers have not completed school ($M=12.73$, $SD=6.50$) compared to those fathers who have completed school ($M=9.00$, $SD=5.24$), $t(222)=-2.27$, $p=.02$.
- b) Students who have scored higher mean FTAS scores are those whose mothers have not completed school ($M=12.36$, $SD=5.07$) compared to those mothers who have completed school ($M=9.09$, $SD=5.33$), $t(227)=-1.99$, $p=.04$.
- c) Students who have scored higher mean FTAS scores are those whose at least one parent not completed school ($M=12.06$, $SD=5.93$) compared to those whose both parents have completed school ($M=8.91$, $SD=5.18$), $t(221)=-2.39$, $p=.018$.
- d) Students who have scored higher mean FTAS scores are those whose father's education is below graduation ($M=11.33$, $SD=5.99$) compared to those fathers who are graduates ($M=8.94$, $SD=5.10$) and post-graduates ($M=8.59$, $SD=5.20$), $F(2,223)=3.64$, $p=.02$.
- e) Students who have scored higher mean FTAS scores are those whose mother's education is below graduation ($M=10.81$, $SD=5.38$) compared to those mothers who are graduates ($M=8.73$, $SD=5.09$) and postgraduates ($M=8.13$, $SD=5.41$), $F(2,228)=4.95$, $p=.008$.
- f) Students who have scored higher mean social derogation scores are female students ($M=4.40$, $SD=2.54$) compared to male students ($M=3.36$, $SD=2.58$), $t(242)=3.16$, $p=.002$.
- g) Students who have scored higher mean social derogation scores are those whose father's education is below graduation ($M=5.00$, $SD=2.52$) compared to those fathers who are graduates ($M=3.82$, $SD=2.56$) and post-graduates ($M=3.43$, $SD=2.61$), $F(2,223)=4.82$, $p=.009$.
- h) Students who have scored higher mean social derogation scores are those whose mothers education is below graduation ($M=4.64$, $SD=2.50$) compared to those mothers who are graduates ($M=3.56$, $SD=2.59$) and postgraduates ($M=3.44$, $SD=2.62$), $F(2,228)=4.81$, $p=.009$.
- i) Students who have scored higher mean cognitive obstruction scores are those whose fathers have not completed school ($M=3.73$, $SD=2.65$) compared to those fathers who have completed school ($M=2.38$, $SD=2.13$), $t(222)=-2.01$, $p=.04$.
- j) Students who have scored higher mean cognitive obstruction scores are those whose at least one parent not completed school ($M=3.47$, $SD=2.32$) compared to those whose both parents have completed school ($M=2.79$, $SD=1.92$), $t(221)=-2.11$, $p=.03$.
- k) Students who have scored higher mean tenseness scores are those whose fathers have not completed school ($M=4.18$, $SD=1.54$) compared to those fathers who have completed school ($M=2.81$, $SD=1.92$), $t(222)=-2.32$, $p=.02$.
- l) Students who have scored higher mean tenseness scores are those whose at least one parent not completed school ($M=3.88$, $SD=1.80$) compared to those whose both parents have completed school ($M=2.79$, $SD=1.92$), $t(221.0)=-2.26$, $p=.02$.

Briefly, these findings suggest that; (a) both parent's completion of school is associated with low exam anxiety scores, cognitive obstruction, and tenseness scores, (b) it is significantly higher when the father has not completed school or mother has not completed school or at least one parent has not completed school, (c) the education level of both parents was associated with exam anxiety score, social

derogation score, and self-esteem score. Exam anxiety score is higher if father and mother's education is below graduation, (d) social derogation score is higher if the father and mother's education level is below graduation (Figures 1–4).

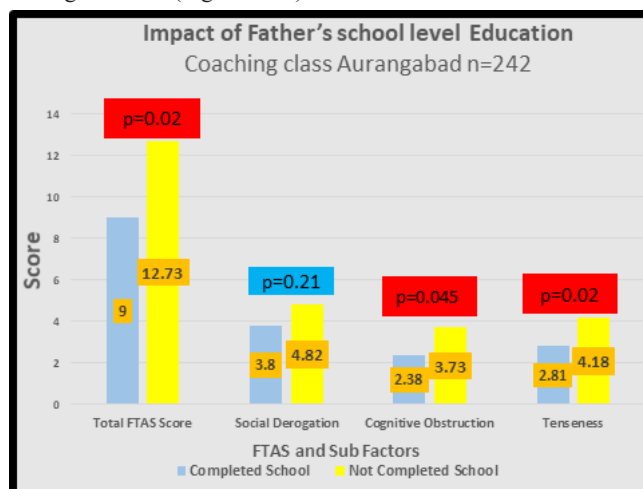


Figure 1 Impact of Father's school level education coaching class Aurangabad n=242.

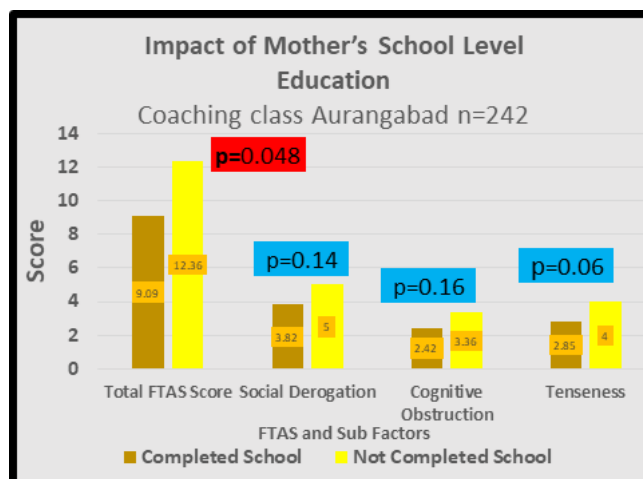


Figure 2 Impact of Mother's school level education coaching class Aurangabad n=242.

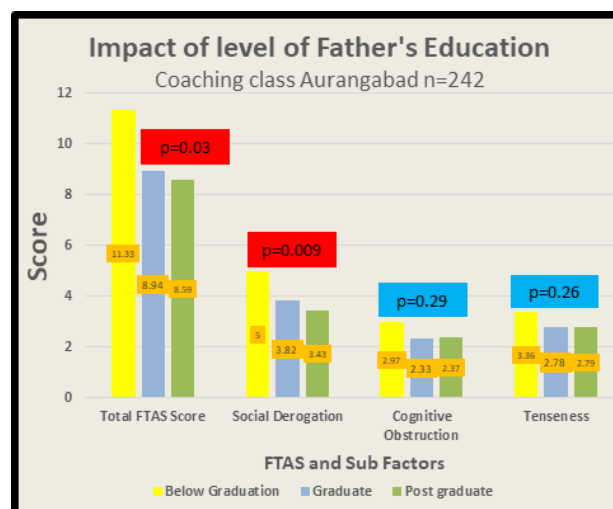


Figure 3 Impact of level of Father's education coaching class Aurangabad n=242.

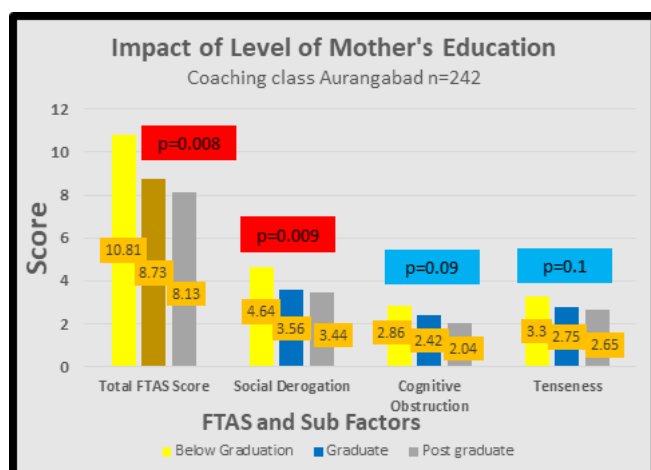


Figure 4 Impact of level of Mother's education coaching class Aurangabad n=242.

Some research has focused on these factors. In one study in China, they found out that, a mother's education has a significant effect on both test anxiety and perceived parental pressure. The finding reflects the fact that mothers in China usually play a more important role than fathers in monitoring their children's academic progress so children usually perceive more parental pressure from their mothers. This can be the reason for our study also. It can be discovered that the father's occupation, mother's occupation, mother's education, and parents' income have a significant impact on both test anxiety and perceived parental pressure. Chinese students perceive more parental pressure from their parents and thus are more stressed about test situations because their parents place greater importance on academic achievement as a means to achieve family glory, which results in constant involvement and monitoring of their children. As they want to improve economic conditions is the utmost important reason why parents constantly monitor their children's academic progress.³² When both parents have a higher educational level, they value it and encourage good study habits, associate studying with financial independence, professionalism and are likely also able to provide real life examples of the benefits of prioritising studies.

Another study examines how mothers' educational levels affect children's test anxiety. The findings indicate that higher levels of maternal education are associated with lower levels of test anxiety in children. The key reason is that educated mothers tend to adopt more effective parenting strategies, such as encouraging a growth mind-set and providing emotional support, which help in reducing test anxiety.²⁸ In another study, the effects of maternal education on children's academic stress and test anxiety was investigated and it was found that children of mothers with higher educational levels report lower academic stress and test anxiety. The key reason is that educated mothers are better equipped to help their children develop effective study habits and coping mechanisms, reducing anxiety related to academic performance.³³

When the influence of father's education was studied, it was found that higher educational attainment in fathers is associated with better test performance and lower anxiety in children. The key reason is that educated fathers are more likely to engage in educational activities with their children, provide intellectual stimulation, and create a supportive home environment. These factors collectively contribute to reduced test anxiety and improved performance.³⁴ Another study provides a comparative analysis of the impact of fathers' versus

mothers' educational levels on their children's test anxiety. It finds that both parents' education levels are important, but fathers' education has a more pronounced effect on reducing test anxiety. The key reason is that fathers with higher education often adopt more modern and supportive parenting styles, which include fostering independence and problem-solving skills, thereby reducing anxiety. Additionally, educated fathers might be more effective in conveying coping strategies for dealing with test-related stress.³⁵ Another research uses a cross-sectional survey to investigate how fathers' educational levels influence test anxiety among secondary school students. The results show that students with fathers who have higher educational qualifications experience lower levels of test anxiety. The key reason is that educated fathers are more likely to be involved in their children's education, providing academic support and setting realistic expectations. This involvement helps in mitigating the stress and anxiety associated with testing.³⁶ Parental educational level has a significant influence on test anxiety levels in children. This is in line with our study wherein low parental educational levels contribute to more test anxiety because of inadequate emotional and academic support from home. Parental education has a positive influence on self-esteem and a negative influence on test anxiety in children. This is explored in more detail in the next section.

As for social derogation, we didn't find many research papers but these are the reasons we found out are children of more educated parents generally attain higher levels of education. Educated parents often have greater familiarity with the education system, value education highly, and provide more academic support and resources at home. Children of highly educated parents are more likely to experience upward social mobility. These parents typically have access to better economic resources, networks, and knowledge that facilitate opportunities for their children.

As for cognitive obstruction, we didn't find many research papers but these are the reasons that we found out are children of more educated parents tend to perform better on cognitive assessments and achieve higher academic success. More educated parents often engage in more stimulating interactions and provide a richer cognitive environment at home. Higher parental education levels are associated with better language skills in children, including vocabulary, comprehension, and communication abilities. Educated parents are more likely to engage in conversations, read to their children, and expose them to a diverse vocabulary.

As tenseness, we didn't find many research papers but these are the reasons we found out are parents with higher education levels generally experience lower levels of stress. Higher education often leads to better job opportunities, higher income, and financial stability, which reduces economic-related stress. Educated parents typically have greater access to resources that can alleviate stress, such as quality childcare, health services, and educational materials. Access to supportive networks, information about child development, and the ability to afford services that ease parenting burdens.

Relationship between self-esteem and test anxiety:

Table 8 shows that the Pearson correlations indicate moderate negative associations between RSES (Rosenberg Self-Esteem Scale) scores and total FTAS (Fear of Test Anxiety Scale) scores across most demographic segments. Significant negative correlations were observed consistently across gender groups, age brackets, and instructional mediums, except for male late adolescents and Marathi medium students. Highest negative correlation strength for female middle adolescents' $r(67) = .66, P < .001$. In most cases, self-esteem and test anxiety show a strong reverse relationship. Of the three sub

factors of FTAS, CO scores have the strongest relationship with RSES scores for most groups. Among male and female early adolescents, the negative correlations were moderate, with coefficients ranging from -0.41 to -0.59. In mid-adolescents, particularly among females, the negative correlations were stronger, ranging from -0.52 to -0.66,

indicating a more pronounced relationship between self-esteem and test anxiety. The highest negative correlation was found among female mid-adolescents ($r = -0.66, p < .001$), suggesting a significant inverse relationship between self-esteem and test anxiety in this group (Figures 5–7).

Table 8 Pearson correlation between RSES & FTAS scores (Total and Sub factor)

		N	Pearson correlations			
			RSES and Total FTAS	RSES and SD	RSES and CO	RSES and T
Total sample		242	-0.58 ^a	-0.48 ^a	-0.50 ^a	-0.39 ^a
Male		129	-0.57 ^a	-0.48 ^a	-0.50 ^a	-0.40 ^a
Female		113	-0.58 ^a	-0.46 ^a	-0.51 ^a	-0.37 ^a
Early adolescence 10-13 yrs	Total	52	-0.50 ^a	-0.49 ^a	-0.31 ^b	-0.38 ^b
	Male	28	-0.59 ^b	-0.53 ^b	-0.27	-0.54 ^b
	Female	24	-0.41 ^b	-0.45 ^b	-0.36	-0.23
Mid adolescence 14-16 yrs	Total	142	-0.64 ^a	-0.52 ^a	-0.58 ^a	-0.43 ^a
	Male	75	-0.63 ^a	-0.52 ^a	-0.63 ^a	-0.43 ^a
	Female	67	-0.66^a	-0.52 ^a	-0.54 ^a	-0.44 ^a
Late adolescence 17-19 yrs	Total	48	-0.46 ^b	-0.32 ^b	-0.48 ^b	-0.24
	Male	26	-0.35	-0.3	-0.33	-0.19
	Female	22	-0.52 ^b	-0.26	-0.60 ^b	-0.21
English medium		203	-0.60 ^a	-0.52 ^a	-0.51 ^a	-0.39 ^a
Marathi medium		30	-0.45 ^b	-0.27	-0.42 ^b	-0.36

a. $P < .001$ b. $P < .05$

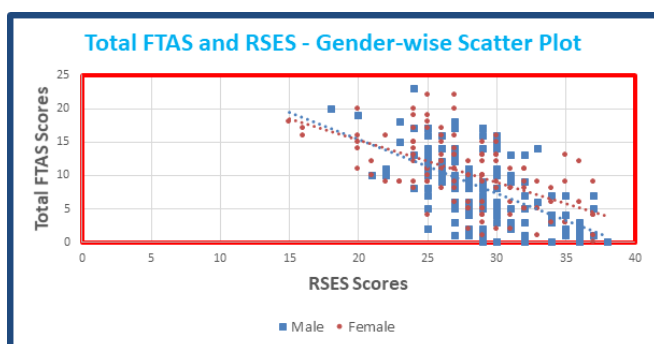


Figure 5 Total FTAS and RSES - Gender-wise scatter plot.

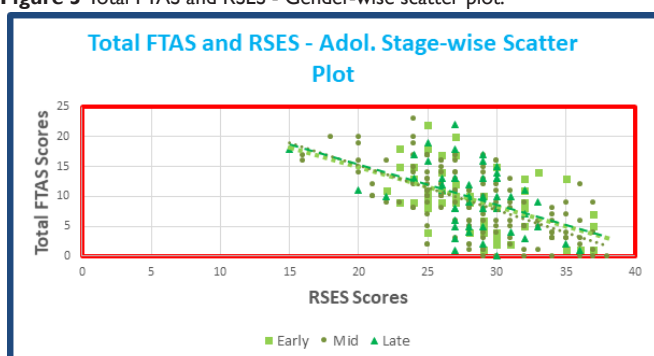


Figure 6 Total FTAS and RSES - Adol. Stage-wise scatter plot.

Many studies have compared self-esteem and test anxiety. In one study in Turkey, they found out that gender is influential on test anxiety and; self-esteem scores and test anxiety levels are negatively correlated. It was observed that female students had more test anxiety than male students and those who had higher self-esteem had less test anxiety.³³ In another study, attachment dimensions (anxiety and avoidance), self-esteem, and three subscales of test anxiety – cognitive obstruction, social derogation, and tenseness are related

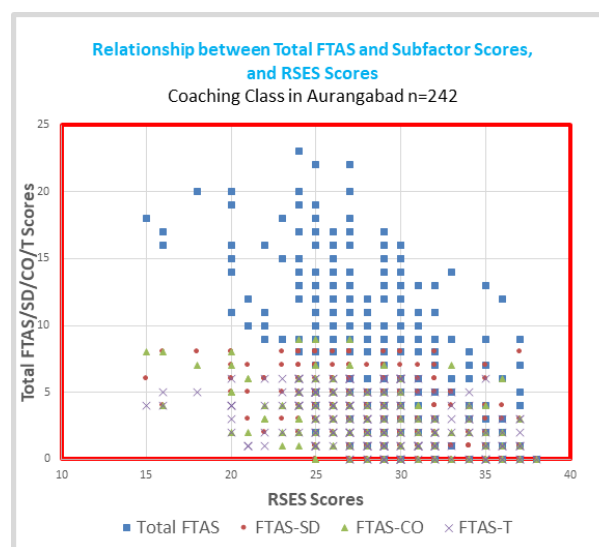


Figure 7 Relationship between total FTAS and sub factor scores, and RSES scores coaching class in Aurangabad n=242.

The most important findings from our study are that gender is influential on test anxiety and that self-esteem score and test anxiety levels are negatively correlated. It was observed that female students had more test anxiety than male students and those who had higher self-esteem had less test anxiety.

In two age groups: adolescents and college students were studied. Results showed that college students revealed higher test anxiety than did high school students on the cognitive obstruction and tenseness scales, whereas high school students revealed higher social derogation than college students. Anxious attachment was related to all three subscales of test anxiety and avoidant attachment was related to cognitive obstruction among college students and to tenseness among high school students. Most of the correlations between anxious attachment

and test anxiety were mediated by self-esteem among high school students.³⁴ The mediation ability of self-esteem was weaker among college students. This also ties in with studies previously mentioning that those who score high on negative emotionality are likely to have low self-esteem and high test anxiety scores.

In one study 374 elementary students completed the RSES, the perceived social support from family, the self-efficacy questionnaire, and the test anxiety inventory. Results showed that self-efficacy was negatively related to test anxiety, a significant negative association existed between self-esteem and test anxiety and there was a negative association between social support and test anxiety.³⁵ Self-efficacy and social support contributed indirectly via self-esteem to explain the variations in test anxiety. In most cases, self-esteem and test anxiety show a strong reverse relationship.

Of the three sub-factors of FTAS, CO scores have the strongest relationships with RSES scores for most groups. Not many studies have focused on comparing CO to self-esteem in the past. However, many unfavourable factors from society and family contribute to women's low self-esteem, such as gender stereotypes, interactions with peers or teachers, cultural emphasis on women's physical appearance, or differential athletic participation. Self-esteem is often contingent, which means that the feelings about oneself are a result of and some common areas on which people usually base their self-esteem are competence, acceptance by others, physical appearance, and such. Adolescents tend to base their self-esteem on their physical appearance (women more than men). These factors can significantly affect performance by affecting cognitive functions like attention, memory, etc. Gender schemas are also an important influencer of self-esteem wherein feminine and masculine characteristics are found in both sexes. Research has discovered that masculinity in both sexes is correlated with self-esteem and as females are developing more masculine characteristics, the level of their self-esteem is becoming more similar to males.³⁶ To improve test anxiety, a supportive environment at school and home is important. Directly improving self-esteem is also a valid approach to reducing test anxiety. Additionally, providing individual counselling for students is a helpful tool.³⁶

Limitations

Self-reporting scales have limitations of the bias of participants. This study was conducted in a specific coaching institution, so application to the general population is not possible.

Conclusion

Our results indicate that test anxiety and self-esteem have a strong negative relationship. Interventions for children and adolescents must focus on improving self-esteem and alleviating test anxiety. Having done studies, co-relating test anxiety and self-esteem over the last 17 years, in various age groups, schools and colleges, and various professional streams- medical engineering nursing, etc. in various parts of India, we have found that social derogation -SD score is the highest score across all cohorts. This emphasizes the need to plan awareness and intervention programs, for teachers and parents, so that they do not exert excess pressure, to excel in examinations, both in school and at home. We also make them aware, that do not judge a child's worth by the marks he or she scores on an examination, but have a holistic assessment, which does not reduce their self-esteem. We also found that teaching children relaxation techniques and a healthy way of managing stress reduces exam anxiety to a significant extent. Teaching them good study habits, study skills, and tips for doing well in examinations, has a great impact on improving their examination

results. AACCI plans to continue doing our interventions, to reduce self-examination anxiety and also increase self-esteem and self-confidence, in various schools and colleges across the country.³⁷⁻⁴¹

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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