Yumed Text
OPEN ACCESS JOURNALS

Journal of Anxiety & Depression

Research | Vol 6 Iss 2
ISSN: 2582-3264
https://dx.doi.org/10.46527/2582-3264.157

Biopsychosocial Underpinnings of Test Anxiety in School Children and Adolescents

Bhave SY[1*], Mota JN [2], Kharbanda S[2], Bhalla L[3], Manchanda S[4] and Sovani A[5]

[1]Executive Director, AACCI, India

[2]Research Assistant, AACCI, India

[3]Delhi Center In-charge, ACCCI, India

[4]NCR Center In-charge, AACCI, India

[5]Advisor, AACCI, India

[*]**Corresponding author:** Bhave SY, Executive Director, AACCI, 601 Alliance Shanti, Shantisheela Co-operative Society, Near FTII, Law College Road, Erandawane, Pune 411004, Maharashtra, India, Tel: +91 7720037735; E-mail: sybhave@gmail.com

Received: August 18, 2023; **Accepted:** August 30, 2023; **Published:** September 07, 2023

Abstract

Irrespective of the students' preparedness, performance anxiety considerably affects their examination results. As part of its multicentric studies on youth behavior in India, the Association of Adolescent and Child Care in India (AACCI) studied test anxiety and its association with age (group I: 10-14 yrs., group II: 15-18 yrs.), gender, sibling status, and Asian cutoffs for BMI. Participants included 964 students (age range: 10-18 yrs.; grades V-XII) from three schools in North India. Test anxiety was measured using the Friedben Test Anxiety Scale (FTAS), which has three subscales - social derogation (SD), cognitive obstruction (CO), and Tenseness (T). AACCI also conducted customized intervention programs based on the following results. There were no gender-based differences in SD, T, and total FTAS scores ($p>0.05$); however, CO was higher among males ($p=0.047$). Group II had higher total FTAS scores ($p=0.054$); similarly, CO was higher in group II for Schools 1 ($p=0.004$) and 2 ($p<0.001$). BMI and sibling status had no statistically significant effects on sub- and total FTAS scores. The current findings indicated the role of age in the experience of test anxiety in this sample, highlighting the need for tailored interventions for older adolescents, who are at the cusp of making their career choices. It may be relevant to further explore specific cognitive and emotional subfactors that are experienced differently in males and females, along with the interplay of other socio-demographic factors, to implement more focused interventions.

Keywords: ***Test anxiety; Body mass index; Exam stress; School students; Tenseness; Social derogation***

Citation: Bhave SY, Mota JN, Kharbanda S, et al. Biopsychosocial Underpinnings of Test Anxiety in School Children and Adolescents. J Anxiety Depress. 2023;6(2):157.

1. Introduction

Examinations in school are a part of a student's life. Hence, any attempt to understand a student's behavioral development is bound to include a close analysis of their predisposition to psychological and cognitive patterns prior to and during examination. Many students experience heightened stress during exams, which is mediated by their perception of examinations as high-stake events and is often marked with a visualization of the negative outcomes of failing or receiving poor marks [1]. Past studies have consistently concluded that such anxiety and heightened arousal negatively influence students' test performance. In literature, this phenomenon has been collectively referred to as "test anxiety" [2].

Test anxiety is a combination of phenomenological, behavioral, emotional, and cognitive responses occurring in an evaluative situation [2]. It is a multi-dimensional and dynamic construct, comprising various factors like worry, emotionality, social derogation, cognitive obstruction, and tenseness. In the context of test anxiety, social derogation refers to the worries of social depreciation by significant others (like parents, society, friends etc.) following failure on a test. Cognitive obstruction indicates difficulties in concentration, retrieval, and effective planning before or during test-taking. Tenseness, on the other hand, involves varied ways of catastrophizing the exam and reflects the somatic and emotional discomfort during a test-taking situation [3].

It has been argued that test anxiety might be a good predictor of an individual's predisposition to anxiety disorders and ineffective problem-solving in future evaluative situations. A student who experiences profound test anxiety might be in disposal of a similar conundrum during employee selection and workplace stress [3]. Some studies have highlighted that students in Asian countries experience more academic stress as compared to students in western countries [4].

Further, with the Indian education system becoming more competitive, there has been an increase in tests and testing requirements. Thereupon, interest in test anxiety has surfaced in the past few years and an increasing number of papers are being published pertaining to the stress faced by students. It is imperative to have more exploratory studies to understand the underpinnings of test anxiety among students since they could be contributing factors responsible for pre-dispositional development of other mental health conditions. Past literature suggests that demographic, socioeconomic, educational system, and cultural perceptions of education's value may all play a role in the variation in academic stress, cross-culturally [5].

A quicker rise in the prevalence of overweight and obesity in India as compared to the global average and recent studies highlighting the prevalence of unhealthy nutritional behavior amongst students are matters of concern. Past studies have underlined the probable role of a student's nutritional behaviors in the immediate and long-term effects on their physical and mental health. Students admit to their propensity to either neglect nutrition or indulge in stress-eating as examinations draw near, in spite of being at an age where they are fairly conscious of how they look [6].

The present study explores test anxiety levels among students in association with various sociodemographic variables like age, gender, sibling status, and body mass index (BMI). The results from the current study were then shared with the school management board to plan robust interventions and regulation modules for the students.

2. Materials and Methods

2.1 Aims

The current study was part of AACCI's multicentric studies on youth behavior in India. The aim of this study was to gauge exam anxiety levels among school children and their associations with variables like age (group I: 10-14 yrs. and group II- 15-18 yrs.), gender (males and females), sibling status, and BMI (categorized as per the World Health Organization guidelines for Asian populations [8]).

AACCI also shared the results with the school management and planned customized intervention program to address test anxiety, focusing on the subfactors of social derogation, cognitive obstruction, and tenseness.

2.2 Sample size and selection criteria

Participants included in the study were children and adolescents (n=964) between 10 and 18 years (grades V to XII) from three schools in North India - two schools in Delhi and one in Gurgaon. The population was selected via convenience sampling on account of the 4th and 5th authors' rapport with the schools. There were no exclusion criteria, and the participants were assigned to the study by the respective school principals.

2.3 Study duration and design

A cross-sectional study was conducted across three North Indian schools over a one-week (one-time data collection and analysis) period in July 2017. Statistical analyses were conducted to determine differences in FTAS based on the aforementioned demographic variables.

2.4 Tools used

Friedben Test Anxiety Scale (FTAS). Test anxiety was assessed using the 23-item FTAS by Friedman and Bendas-Jacob [9]. Responses on the items are scored as 1 (*yes*) and 0 (*no*). The total scores range from 0 to 23 with high scores reflecting high trait test anxiety. This scale yields three sub-scores - social derogation (items 1-8 cater to fears of deprecation and social belittlement following anticipated test failure), cognitive obstruction (items 9-17 gauge the subjective difficulties with concentration, recall, effective problem-solving before and during evaluative situations), and nervous tension or tenseness (items 18-23 assess perceived emotional and bodily discomfort).

The scale has been standardized and is psychometrically sound with Cronbach's alpha coefficients of 0.91, 0.86, 0.85, and 0.81 for the entire scale and sub-scales, respectively [9].

World Health Organization's Asian cut-offs for BMI. BMI was calculated using weight (in kilograms) and height (in meters) as kg/m^2 and categorized - as underweight (UW; BMI<18.5), normal weight (NW; BMI=18.5-22.9), overweight (OW; BMI=23-24.9), and obese (OT; BMI>25) - according to the WHO cut-off guidelines for Asian populations [8].

2.5 Procedure

As part of its multicentric studies on youth behavior in India, AACCI designed a survey questionnaire comprising psychometric tools such as the Children's Perceived Self-control Scale [10], Martin-Larsen Approval Motivation Scale [11], and Friedben Test Anxiety Scale [9] to gauge the participants' stratum of perceived self-control (PSC), approval motivation (AM), and test anxiety (FTAS), respectively. It also included questions pertaining to the participants' gender, age, sibling status, height, and weight.

The population for this study was selected via convenience sampling, and the 4th and 5th authors trained teachers from the three schools to administer the questionnaire for data collection over a one-week period in July 2017. Data were collected using the paper-pencil medium. Additionally, AACCI has published individual papers for the aforementioned scales, exploring their distinct relationships with the demographic variables for the same cohort [12].

This paper contains results for FTAS, which were then used to design classroom interventions and shared with the school management board to regulate the cohort's test anxiety levels. The FTAS has been used in studies by the authors both nationally [13-15] and internationally [16].

2.6 Permissions and ethical considerations

Ethical clearance for this project was given by AACCI's Institutional Ethics Committee. Permission for conducting the current study was procured from the respective schools' principals and through them, from students' parents. Informed written assent (as legal consent can only be obtained from individuals above the age of 18 years) was obtained from students after explaining the rationale and benefits of the study in the language(s) that they could comprehend. The assent was part of the questionnaire and anonymity was maintained. This was not a clinical trial, and the participants were not patients.

2.7 Statistical analysis

The data were analyzed using Microsoft Excel's Version 2306. BMI was calculated using weight (in kilograms) and height (in meters) as kg/m^2 and categorized - as underweight (UW; BMI<18.5), normal weight (NW; BMI=18.5-22.9), overweight (OW; BMI=23-24.9), and obese (OT; BMI >25) - according to the WHO cut-off guidelines for Asian populations [8].

t-tests were conducted to assess age-, gender-, and sibling-status-based differences in FTAS scores, and one-way ANOVAs were conducted to test for BMI-based differences in PSC scores. Statistical significance of the calculated coefficients was considered at $p<0.05$.

3. Results

3.1 Sample characteristics

Participants (n=964) included in this study were children from middle and high socioeconomic strata across three co-ed. English-medium schools (School 1: n=346; School 2: n = 366; School 3: n=252). The sample characteristics and age and gender distribution across schools have been listed in TABLES 1 and 2, respectively.

TABLE 1. **Sample Characteristics (N=964).**

Demographic variables	Sub-demographic variables	N (%)
Age†	Group I (10-14 years)	483 (50.1%)
	Group II (15-18 years)	403 (41.8%)
	Missing data- Age not mentioned	78 (8.09%)
Gender‡	Male	474 (49.17%)
	Female	361 (37.45%)
	Missing data- Gender not mentioned	129 (13.38%)
Sibling Status	Siblings	559 (57.99%)
	No siblings	405 (42.01%)
	Missing data	0 (0%)
BMI categories§	UW (<18.5)	340 (35.27%)
	NW (18.5-22.9)	306 (31.74%)
	OW (23-24.9)	47 (4.87%)
	Obese (>25)	65 (6.74%)
	Missing data- BMI could not be calculated because height and/or weight were not mentioned	206 (21.37%)

†We considered n=886 (n=964 - 78) to test for the effects of age on PSC as 78 participants had not mentioned their age.

‡ We considered n=835 (n=964 - 129) to test for the effects of gender on PSC as 129 participants had not mentioned their gender.

§We considered n=758 (n=964 - 206) to test for the effects of BMI on PSC as 206 participants had not mentioned their height and/or weight.

Of the three schools, the missing data were mainly from School 3.

TABLE 2. **Age and gender distribution across three North Indian Schools (n=964).**

School	Age†			Gender‡		
	Group I (10-14 yrs.)	Group II (15-18 yrs.)	Data not provided	Males	Females	Data not provided
School 1	161 (16.7%)	179 (18.57%)	6 (0.62%)	166 (17.22%)	155 (16.08%)	25 (2.59%)
School 2	242 (25.1%)	115 (11.93%)	9 (0.93%)	196 (20.33%)	141 (14.63)	29 (3.01%)
School 3	80 (8.30%)	109 (11.31%)	63 (6.54%)	112 (11.62%)	65 (6.74%)	75 (7.78%)
Total	483	403	78	474	361	129

	(50.10%)	(41.80%)	(8.09%)	(49.17%)	(37.45%)`	(13.38%)
†We considered n=886 (n=964 - 78) to test for the effects of age on PSC. ‡ We considered n=835 (n=964 - 129) to test for the effects of gender on PSC. Of the three schools, the missing data were mainly from School 3.						

3.2 Effects of age on FTAS scores

An age-based analysis reflected that the mean FTAS scores were significantly higher in group II (M=10.10, SD=4.338) as compared to group I (M=9.62, SD=4.482), t(884)=1.606 at p=0.054. Further, the mean scores for cognitive obstruction were significantly higher in group II (M=2.54, SD=2.081) as compared to group I (M=2.11, SD=1.870), t(884)=3.225 at p<0.001. Similarly, the mean scores for tenseness were significantly higher in group II (M=3.35, SD=1.681) as compared to group I (M=3.15, SD=1.768), t(884)=1.721 at p=0.043. However, there was no significant difference in social derogation between the two age groups (p>0.05, TABLE 3).

TABLE 3. **Age-based differences in mean FTAS scores - Total sample from three North Indian Schools (n=886).**

		FTAS Scores			
Age	**t-test**	**Social Derogation**	**Cognitive Obstruction**	**Tenseness**	**Total FTAS Score**
Group I: 10-14 yrs.	M ± SD (n = 483)	4.37 ± 2.484	2.11 ± 1.870	3.15 ± 1.768	9.62 ± 4.482
Group II: 15-18 yrs.	M ± SD (n=403)	4.22 ± 2.175	2.54 ± 2.081	3.35 ± 1.681	10.10 ± 4.338
t		0.950	3.225	1.721	1.606
***p*-value**		0.171	<0.001***	0.043*	0.054*
†We considered n=886 (n=964 - 78) to test for the effects of age on exam anxiety as 78 participants (School 1=6; School 2=9; School 3=63) had not mentioned their gender. *p<0.05, **p<0.01, ***p<0.005					

A school-wise age-based analysis suggested that the mean scores for cognitive obstruction were significantly higher in group II (M =2.433, SD_1=2.052) as compared to group I (M=1.856, SD=1.782) in **School 1,** *t*(315)=2.663 at p=0.004. Similarly, the mean scores for cognitive obstruction were significantly higher in group II (M=3.000, SD=2.272) as compared to group I (M=2.241, SD=1.942) in **School 2**, *t*(328)=3.135 at p<0.001. Additionally, the mean scores for tenseness were significantly higher in group II (M=3.434, SD=1.862) as compared to group I (M=3.058, SD=1.901) in **School 2**, *t*(328)=1.688 at p=0.046. Similarly, the mean FTAS scores were significantly higher in group II (M=10.604, SD=4.832) as compared to group I (M=9.710, SD=4.566) in **School 2**, *t*(328)=1.630 at p=0.052. However, there were no significant differences in social derogation between the two age groups across three schools (p>0.05; TABLE 4).

TABLE 4. **Gender-based differences in mean FTAS scores - Comparison among three North Indian schools (n = 886).**

			FTAS Scores			
School	**Gender**	**t-test**	**Social Derogation**	**Cognitive Obstruction**	**Tenseness**	**Total FTAS Score**
School 1	**Males**	M ± SD (n=153)	4.333 ± 2.763	1.856 ± 1.782	3.196 ± 1.674	9.386 ± 4.628
	Females	M ± SD (n=164)	4.128 ± 2.271	2.433 ± 2.052	3.299 ± 1.713	9.860 ± 4.523
	t		-0.725	2.663	0.539	-0.920
	p-value		0.235	0.004***	0.295	0.179
School 2	**Males**	M ± SD (n=224)	4.411 ± 2.403	2.241 ± 1.942	3.058 ± 1.901	9.710 ± 4.566
	Females	M ± SD (n=106)	4.170 ± 2.396	3.000 ± 2.272	3.434 ± 1.862	10.604 ± 4.832
	t		0.851	3.135	1.688	1.630
	p-value		0.198	<0.001***	0.046*	0.052*
School 3	**Males**	M ± SD (n=80)	4.075 ± 1.682	2.013 ± 1.642	3.513 ± 1.423	9.600 ± 3.325
	Females	M ± SD (n=109)	4.229 ± 1.829	2.220 ± 1.912	3.385 ± 1.459	9.835 ± 3.630
	t		0.593	0.783	0.598	0.455
	p-value		0.277	0.217	0.275	0.325

†We considered n=886 (n=964 - 78) to test for the effects of age on exam anxiety as 78 participants (School 1=6; School 2=9; School 3=63) had not mentioned their age.

*p<0.05, **p<0.01, ***p<0.005

3.3 Effects of gender on FTAS scores

A one-way ANOVA indicated that the mean scores for cognitive obstruction were significantly higher among males (M=2.394, SD=2.067) as compared to females (M=2.162, SD=1.881), $t(833)=1.674$ at p=0.047. However, there were no significant gender-based differences in social derogation, tenseness, and total FTAS scores (p>0.05; TABLE 5).

A school-wise gender-based analysis suggested that the mean scores for tenseness were significantly higher among females (M=3.785, SD=1.305) as compared to males (M=3.330, SD = 1.509) in **School 3**, $t(175)=2.026$ at p=0.022. However, there were no significant gender-based differences in social derogation, cognitive obstruction, and mean FTAS scores across all schools (p>0.05; TABLE 6).

TABLE 5. **Gender-based differences in mean FTAS scores - Total sample from three North Indian Schools (n=835).**

		FTAS Scores			
Gender	**t-test**	Social Derogation	Cognitive Obstruction	Tenseness	Total FTAS Score
Males	M ± SD (n=474)	4.217 ± 2.311	2.394 ± 2.067	3.192 ± 1.746	9.804 ± 4.394
Females	M ± SD (n=361)	4.334 ± 2.333	2.162 ± 1.881	3.365 ± 1.722	9.861 ± 4.446
t		0.720	1.674	1.424	0.184
***p*-value**		0.236	0.047*	0.077	0.427

†We considered n=835 (n=964 - 129) to test for the effects of gender on exam anxiety as 129 participants (School 1=25; School 2=29; School 3=75) had not mentioned their gender.

*p<0.05, **p<0.01, ***p<0.005

TABLE 6. **Gender-based differences in mean FTAS scores - Comparison among three North Indian schools (n = 835).**

			FTAS Scores			
School	**Gender**	**t-test**	Social Derogation	Cognitive Obstruction	Tenseness	Total FTAS Score
School 1	**Males**	M ± SD (n=166)	4.084 ± 2.680	2.307 ± 1.962	3.229 ± 1.548	9.621 ± 4.676
	Females	M ± SD (n=155)	4.403 ± 2.308	2.026 ± 1.943	3.227 ± 1.856	9.656 ± 4.461
	t		1.134	1.287	0.009	0.069
	p-value		0.129	0.100	0.497	0.472
School 2	**Males**	M ± SD (n=196)	4.398 ± 2.31	2.628 ± 2.209	3.082 ± 2.011	10.107 ± 4.475
	Females	M ± SD (n=141)	4.293 ± 2.613	2.379 ± 1.951	3.321 ± 1.719	9.993 ± 4.96
	t		0.396	1.069	1.144	0.221
	p-value		0.346	0.143	0.127	0.413
School 3	**Males**	M ± SD (n=112)	4.098 ± 1.801	2.116 ± 1.930	3.330 ± 1.509	9.545 ± 3.782

	Females	M ± SD (n=65)	4.262 ± 1.689	2.015 ± 1.526	3.785 ± 1.305	10.062 ± 3.061
	t		0.595	0.360	2.026	0.938
	p-value		0.276	0.360	0.022*	0.175

†We considered n=835 (n=964 - 129) to test for the effects of gender on exam anxiety as 129 participants (School 1=25; School 2=29; School 3=75) had not mentioned their gender.

*p<0.05, **p<0.01, ***p<0.005

3.4 Age- and gender-wise differences in FTAS scores

Social Derogation. There were no significant age- and gender-based differences in social derogation scores (TABLE 7).

Cognitive Obstruction. The mean scores for cognitive obstruction were significantly higher in group II (M_{males}=2.581, SD_{males}=2.182; $M_{females}$=2.464, $SD_{females}$=1.986) as compared to group I (M_{males}=2.194, SD_{males}=1.928; $M_{females}$=1.912, $SD_{females}$=1.726) among males and females, respectively, *t*(462)=0.204 at p=0.022 and *t*(355)=2.793 at p=0.003. Contrarily, there was no significant difference in cognitive obstruction between males and females in Group II. However, the mean score for cognitive obstruction was significantly higher in males (M=2.194, SD=1.928) as compared to females (M=1.912, SD=1.726) for group I, *t*(450)=1.624 at p=0.053 (TABLE 7).

Tenseness. There were no significant differences in tenseness between the two age groups for males. However, the mean scores for tenseness were significantly higher in group II (M=3.576, SD=1.741) as compared to group I (M=3.216, SD=1.691) among females, *t*(355)=1.961 at p=0.025. Furthermore, there was no significant difference in tenseness between males and females in Group I. However, the mean score for tenseness was significantly higher in females (M=3.576, SD=1.741) as compared to males (M=3.244, SD=1.65) for group II, *t*(367)=1.855 at p=0.032 (TABLE 7).

Total FTAS Scores. There were no significant differences in total FTAS scores between males and females in the two age groups. Contrarily, the mean FTAS scores were significantly higher in group II (M=10.351, SD=4.505) as compared to group I (M=9.466, SD=4.38) among females, *t*(355)=1.860 at p=0.032 (TABLE 7).

TABLE 7. **Mean FTAS scores: Age- and gender-based differences - Total sample from three North-Indian schools (n = 821).**

			FTAS Scores			
Gender	**Age**	**t-test**	**Social Derogation**	**Cognitive Obstruction**	**Tenseness**	**Total FTAS Score**
Males	Group I: 10-14 yrs.	M ± SD (n=247)	4.312 ± 2.459	2.194 ± 1.928	3.162 ± 1.821	9.668 ± 4.446
	Group II: 15-18 yrs.	M ± SD (n=217)	4.073 ± 2.135	2.581 ± 2.182	3.244 ± 1.65	9.899 ± 4.317
	t		1.106	0.204	0.507	0.565

	p-value		0.135	0.022*	0.306	0.286
Females	Group I: 10-14 yrs.	M ± SD (n=205)	4.338 ± 2.421	1.912 ± 1.726	3.216 ± 1.691	9.466 ± 4.38
	Group II: 15-18 yrs.	M ± SD (n=152)	4.311 ± 2.243	2.464 ± 1.986	3.576 ± 1.741	10.351 ± 4.505
	t		0.107	2.793	1.961	1.860
	p-value		0.457	0.003***	0.025*	0.032*
			FTAS Scores			
Age	**Gender**	**t-test**	**Social Derogation**	**Cognitive Obstruction**	**Tenseness**	**Total FTAS Score**
Group I: 10-14 yrs.	Males	M ± SD (n=247)	4.312 ± 2.459	2.194 ± 1.928	3.162 ± 1.821	9.668 ± 4.446
	Females	M ± SD (n=205)	4.338 ± 2.421	1.912 ± 1.726	3.216 ± 1.691	9.466 ± 4.38
	t		0.115	1.624	0.322	0.484
	p-value		0.454	0.053	0.374	0.314
Group II: 15-18 yrs.	Males	M ± SD (n=217)	4.073 ± 2.135	2.581 ± 2.182	3.244 ± 1.65	9.899 ± 4.317
	Females	M ± SD (n=152)	4.311 ± 2.243	2.464 ± 1.986	3.576 ± 1.741	10.351 ± 4.505
	t		1.028	0.525	1.855	0.971
	p-value		0.152	0.300	0.032*	0.166

†We considered n=821 (n=964 - 143) to test for the effects of age on exam anxiety among males and females as 143 participants had not mentioned their age and gender.

*p<0.05, **p<0.01, ***p<0.005

3.5 Effects of BMI and sibling status on FTAS scores

Interestingly, one-way ANOVAs indicated that the participants' BMI and sibling status had no statistically significant effects on social derogation, cognitive obstruction, Tenseness, and total FTAS scores (p>0.05).

4. Discussion

The current study attempted to understand the biopsychosocial factors influencing the students' perception of test anxiety. The aim was to explore various factors impacting test anxiety among students to help develop interventional and awareness programs, promoting healthier coping techniques.

In our study, we found a positive relationship between test anxiety and age, such that older adolescents presented with higher levels of anxiety. This finding is in line with past research done by Torrano et al. [17]. Similar patterns were observed in our study with regards to the various subfactors like cognitive obstruction across the two schools. This could be explained in the context of more academic demands and pressure to perform among older adolescents in order to secure admission in different colleges [14]. It is interesting to note that these trends held true regardless of whether the results were looked at as a whole, or in a school via school-wise analysis. It is understandable that cognitive obstruction scores showed higher trends for the older age group, since there is more material to be learned for every examination, and the demand on cognitive performance is high for the older classes. The pressure placed by parents and teachers on good performance in examinations also increases exponentially as students move to higher classes.

The increase in the Tenseness factor as students move to higher classes is something that requires attention from mental health professionals, teachers and parents as this will have an adverse effect on the examination performance of students at levels where they matter more to all concerned. Rather, it would be advantageous if students learn to handle their anxiety and tenseness well before they reach higher classes.

The most interesting finding, and one that has repeatedly presented itself in AACCI's research over the years, and with different samples, is the fact that social derogation shows no difference across the younger and older student groups. International work done by some of the authors [16] showed that this pattern was rather unique to India where we lay a lot of emphasis on examination performance of children as against countries such as the United States. We certainly need to pay attention to this finding since it makes it evident that students across all ages and classes are worried about what others may think about their examination performance and this may adversely influence test performance.

A t-test was conducted to understand the gender-wise differences in test anxiety. Interestingly, there were no significant difference in the overall test anxiety experienced by males and females. This is in line with the findings of a study done by Bodas, Ollendick, and Sovani [16] yielding similar test anxiety scores among males and females in the urban setting. A mixed trend has been observed in the past literature wherein, in some settings, males have reported higher anxiety [14] and in some setting females have reported higher anxiety [18]. It could be possible that various economic, geographical, and societal factors play an important role in mediating the importance of academia, in turn, influencing the anxiety experienced by the students.

Additionally, tenseness was found to be higher in females than in males. This is in-line with the past research done by Bhave et al [13]. There could be many contributing factors to this, including societal expectations and gendered norms, lower self-efficacy, and higher perceived threat due to the lack of familial support for females in a schooling environment [17]. In terms of cognitive obstruction, findings from the current study are partially in-line with past literature, which suggests that the males had higher scores in this subfactor, than their female counterparts [13]. This finding is of pertinent value since this may indicate a need for training to deal with faulty styles of handling problem solving and sub-optimal test taking behaviors.

Interestingly, there were no significant age- and gender-based differences in social derogation, and the social derogation sub score was found to be the highest amongst all sub-scores. This trend has been repeatedly seen in the past studies done by AACCI [13] [14] [15]. This has been observed across the exam anxiety surveys, both in school and college students, including

students in professional courses like the undergraduate medical and nursing and post-graduate engineering courses. These could be better explained in the Indian context, wherein, exams and grades earned by students are highly valued. Worry about scoring low marks may have significant ramifications. Furthermore, the "worth" of a student is determined using these scores as a benchmark, exerting an unsurmountable pressure on them [14]. This, along with faulty coping styles, may lead to long lasting effects on a student's test taking behavior in a high-stake situation.

Furthermore, we found no significant relationship between test anxiety and body mass index. The relationship between BMI and test anxiety has been understudied, especially in the Indian scenario. Though there is growing evidence for nutritional behavior impacting mental health, it's on the lines of obesity and general anxiety. The results are in line with past research that demonstrates that mean anxiety scores of underweight, normal weight, and overweight individuals are similar to that of the normative data. [18]. There were no significant BMI-based differences in the sub-factors as well, which is not in line with the past data that suggests that the individuals who are obese might show more anxiety symptoms and may be at a risk to develop other anxiety symptoms [18].

5. Conclusions

Academic stress and test anxiety are common issues in today's society. Extensive work continues to explore the underpinnings and impact of test anxiety to better understand the negative implications, which are not limited to low academic achievement but may permeate to various high-stake situations. Mixed trends in the gender differences in various subfactors of test anxiety is an area that can be further studied to understand the interplay among various other socio-demographic features that may influence the experience of academia and anxiety in these students. We also found that older adolescents tend to experience heightened level of anxiety and stress which may be due to higher stakes, extensive competition and parental pressure. In terms of the subfactors, social derogation has been consistently found to be elevated across the students in various studies and surveys which may be indicative of unrealistic expectations from students, increased societal pressure and a fear of being ridiculed for lower performance. Hence a robust intervention plan is required catering to the differential experience of test anxiety for different students.

6. Acknowledgements

AACCI extends its gratitude toward Dr. Surekha Joshi (Research Co-Ordinator, AACCI) for critically evaluating the final manuscript. AACCI is immensely grateful to the school management and parents for providing consent and to the children for their participation in the study.

7. Source of Funding

Self-funded by AACCI.

8. Conflict of Interest

There was no personal, organizational, or financial conflict of interest with regards to design, conduct, supervision, reporting, and presentation of data.

REFERENCES

1. Sena JD, Lowe PA, Lee SW. Significant predictors of test anxiety among students with and without learning disabilities. J Learn Disabil. 2007;40(4):360-76.
2. Zeidner M. Test anxiety: The state of the art. New York: Plenum, USA; 1998.
3. Zeidner M. Test anxiety in educational contexts: Concepts, findings, and future directions. In: Schutz PA, Pekrun R, editors. Emotion in education. Cambridge, Massachusetts: Elsevier Academic Press, USA; 2007. 165-84 p.
4. Deb S, Majumdar B, Sun J. "Academic stress, parental pressure, anxiety and mental health among Indian school students," paper presented at the International Conference on Students' Mental Health: Issues and Challenges, Puducherry, 2011.
5. Deb S, Strodl E, Sun J. Academic-related stress among private secondary school students in India. Asian Educ Dev Stud. 2014;3(2):118-34.
6. Bhave SY. Understanding the Pattern of Adolescents' Nutritional Behaviour and Lifestyle. Indian J Youth Adolesc Health. 2023;10(01):1-7.
7. Bhave S, Joshi S, Kharbanda S, et al. Exploratory Study of Subfactors of Test Anxiety Among School Students. J MAR Pediatr. 2023;3(6)1-10.
8. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004;363(9403):157-63.
9. Friedman IA, Bendas-Jacob O. Measuring Perceived Test Anxiety in Adolescents: A Self-Report Scale. Educ Psychol Meas. 1997;57(6):1035-46.
10. Humphrey LL. Children's and teachers' perspectives on children's self-control: the development of two rating scales. J Consult Clin Psychol. 1982;50(5):624-33.
11. Martin HJ. A Revised Measure of Approval Motivation and Its Relationship to Social Desirability. J Pers Assess. 1984;48(5):508-19.
12. Bhave S, Neglur M, Sovani A, et al. A desire to be perceived positively: Approval motivation in School Children. Indian J Clin Psychol. 2023;49(02).
13. Bhave SY, Joshi S, Kharbanda S, et al. Exploratory study of subfactors of test anxiety among school students. J MAR Pediatr. 2023:3(6)1-10.
14. Bhave S, Sovani A, Veeraraghavan S, et al. Examination anxiety in junior college youth of Mumbai who participated in LSE training workshops. Asian J Pediatr Pract. 2011:12-5.
15. Sovani A, Thatte S, Nadkarni A. "Perceived sources of Examination anxiety among school and college students," Paper presented at fourth annual conference of the Indian Association of Mental Health, Hyderabad, India, 2000.
16. Bodas J, Ollendick TH, Sovani AV. Test anxiety in Indian children: A cross-cultural perspective. Anxiety Stress Coping. 2008;21(4):387-404.
17. Torrano R, Ortigosa JM, Riquelme A, et al. Test Anxiety in Adolescent Students: Different Responses According to the Components of Anxiety as a Function of Sociodemographic and Academic Variables. Front Psychol. 2020;11:612270.
18. Herhaus B, Kersting A, Brähler E, et al. Depression, anxiety and health status across different BMI classes: A representative study in Germany. J Affect Disord. 2020;276:45-52.