Test Anxiety and Resilience among Engineering Students

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Abstract

The purpose of the study was to find out test anxiety and resilience among engineering students. The study was conducted on 280 participants. The sample was collected using unrestricted self-selected survey methods from Kerala. Psychological measures like the west side test anxiety scale and Nicholson McBride resilience questionnaire were administered to the participants. The collected data were statistically analyzed using Karl Pearson's product- moment correlation coefficient, Independent student's t test, One Way ANOVA.

Keywords: Test Anxiety; Resilience; Engineering Students

Abbreviations

IBSR: Inquiry-Based Stress Reduction; GAD: Generalized Anxiety Disorder; WTAS: Westside Test Anxiety Scale; NMRQ: Nicholson McBride Resilience Questionnaire; DMRT: Duncan's Multiple Range Test.

Introduction

Anxiety is an uncontrollable, diffuse, unpleasant, and persistent state of negative affect characterized by apprehensive anticipation regarding unpredictable and unavoidable future danger and accompanied by physiological symptoms of tension and a constant state of heightened vigilance [1]. There are different types of anxiety-related disorders, but when it focuses on students, test anxiety is the most common type of anxiety experienced by them [2]. Students often experience great change on a personal level because of high test anxiety due to exams and workload [3]. Especially because of their adaptation process to new teachers and colleagues, learning new content constantly being updated, curricular reorganizations, and demanding and selective assessments [4]. This situation causes a

change in the habits of young people related to the practice of physical activity and emotionality, which can produce a decrease and even abandonment of those behaviors related to academic performance. However, a series of internal mechanisms related to adaptive habits are essential to overcome the possible alterations that may occur, such as the recognition of resilience. Therefore, this study aims to analyse the relationship between test anxiety and resilience among engineering students. Anxiety disorders are characterized by excessive fear or anxiety that interferes with an individual's daily functioning. Theoretical perspectives on anxiety disorders often include:

Biological Factors

Genetic Predisposition: Family history and twin studies suggest a genetic component to anxiety disorders.
Neurobiological Factors: Imbalances in neurotransmitters (e.g., serotonin, norepinephrine) and dysregulation in brain regions involved in fear and anxiety (e.g., amygdala, prefrontal cortex) are associated with anxiety disorders.
Psychological Factors: Cognitive Theories: Cognitive distortions, such as catastrophizing or overestimating

danger, contribute to the development and maintenance of anxiety.

Behavioral Theories: Classical and operant conditioning models suggest that anxiety can be learned through experiences and reinforced through avoidance behaviors.

Environmental Factors: Stress and Trauma: Exposure to significant stress or traumatic events can trigger or exacerbate anxiety disorders.

Early Life Experiences: Childhood adversities, parenting styles, and early attachment experiences can influence the development of anxiety disorders.

DSM-5 Criteria for Anxiety Disorders

The DSM-5 categorizes anxiety disorders into several distinct types, each with its specific criteria:

Generalized Anxiety Disorder (GAD): Excessive anxiety and worry occurring more days than not for at least 6 months, about various events or activities. The individual finds it difficult to control the worry. The anxiety and worry are associated with at least three of the following symptoms (with at least some symptoms being present more days than not for the past 6 months): Restlessness or feeling keyed up or on edge. Being easily fatigued. Difficulty concentrating or mind going blank, Irritability, Muscle tension, Sleep disturbance (difficulty falling or staying asleep, or restless and unsatisfying sleep), The anxiety, worry, or physical symptoms cause significant distress impairment in social, occupational, or other important areas of functioning. The disturbance is not attributable to a substance or another medical condition, and it is not better explained by another mental disorder.

Panic Disorder: Recurrent unexpected panic attacks (sudden onset of intense fear or discomfort reaching a peak within minutes), which are characterized by four or more of the following symptoms:

Palpitations, pounding heart, or accelerated heart rate, Sweating, Trembling or shaking, Sensations of shortness of breath or smothering, Feelings of choking, Chest pain or discomfort, Nausea or abdominal distress, Dizziness, lightheadedness, or feeling faint, Chills or heat sensations, Paresthesias (numbness or tingling sensations), Derealization (feelings of unreality) or depersonalization (being detached from oneself), Fear of losing control or "going crazy., Fear of dying. At least one of the attacks has been followed by 1 month (or more) of one or both of the following, Persistent concern or worry about additional panic attacks or their consequences, A significant maladaptive change in behavior related to the attacks.

Social Anxiety Disorder (Social Phobia): Marked fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others. Examples include social interactions, being observed, and performing in front of others. The individual fears that they will act in

a way (or show anxiety symptoms) that will be negatively evaluated. The social situations almost always provoke fear or anxiety. The social situations are avoided or endured with intense fear or anxiety. The fear or anxiety is out of proportion to the actual threat posed by the social situation. The fear, anxiety, or avoidance is persistent, typically lasting 6 months or more. The fear, anxiety, or avoidance causes significant distress or impairment in social, occupational, or other important areas of functioning. The fear, anxiety, or avoidance is not attributable to a substance or another medical condition, and it is not better explained by another mental disorder.

Specific Phobia: Marked fear or anxiety about a specific object or situation (e.g., flying, heights, and animals, receiving an injection, seeing blood). The phobic object or situation almost always provokes immediate fear or anxiety. The phobic object or situation is actively avoided or endured with intense fear or anxiety.

The fear or anxiety is out of proportion to the actual danger posed.

The fear, anxiety, or avoidance is persistent, typically lasting 6 months or more.

The fear, anxiety, or avoidance causes significant distress or impairment in functioning.

The fear, anxiety, or avoidance is not attributable to a substance or another medical condition, and it is not better explained by another mental disorder.

Agoraphobia: Marked fear or anxiety about two (or more) of the following five situations: Using public transportation, Being in open spaces, Being in enclosed places, Standing in line or being in a crowd, Being outside of the home alone, The individual fears or avoids these situations because of thoughts that escape might be difficult or help might not be available in the event of having a panic attack or other incapacitating or embarrassing symptoms, The agoraphobic situations almost always provoke fear or anxiety, The agoraphobic situations are actively avoided, require the presence of a companion, or are endured with intense fear or anxiety, The fear or anxiety is out of proportion to the actual danger posed, The fear, anxiety, or avoidance is persistent, typically lasting 6 months or more, The fear, anxiety, or avoidance causes significant distress or impairment in functioning, The fear, anxiety, or avoidance is not attributable to a substance or another medical condition, and it is not better explained by another mental disorder.

Test Anxiety

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 [5]. Test anxiety is an internalizing behavior among students and a major emotional problem with a negative

effect on learning [6]. Test anxiety is the reaction to stimuli associated with a person's experience of a test or evaluation procedure [5,7]. The term test in test anxiety indicates the anxiety-evoking situation and/or the causes of anxiety relating to training, learning, and performance in their broad sense [8]. The nature of test anxiety has been characterized as multifaceted and inclusive of task-irrelevant cognitions heightened physiological arousal, and inefficient study behavior [9].

Most of the time, test anxiety affects the ability to concentrate and pay attention, and together with other manifestations, it prevents the student from being able to concentrate at his or her maximum capacity or to remember the information learned so that the assessment will not sincerely reflect his ability and performance. However, some students view assessment as a challenge and are less affected by test anxiety. Testing anxiety is a pervasive problem in modern society, not just in school [10]. Students who experience this state of test anxiety need to be observed and helped to get over it so that the anxiety does not affect their school performance. It is therefore important to be aware of the importance of the teacher's influence on pupils. Students who experience this state of test anxiety need to be observed and helped to get over it so that the anxiety does not affect their school performance. It is therefore important to be aware of the importance of the teacher's influence on pupils [11,12]. The interference model and the learning-deficit model [13]. According to the interference model, anxious students are distracted due to worrying and task-irrelevant cognitions, and the learning-deficit model proposes that it is students' ineffective study habits during preparation for a test that leads to anxiety and lower performance on the test. The other factor mentioned Is Cognitive Test Anxiety, also known as worry. It is mostly composed of the individual's cognitive reactions to situations where they are being evaluated in the times before, during, and after those tasks.

Resilience

Life is never perfect. As much as we wish things would 'just go our way,' difficulties are inevitable, and we all have to deal with them [14]. When we face adversity, misfortune, or frustration, resilience helps us bounce back. It helps us survive, recover, and even thrive in the face and wake of misfortune [15]. Resilience has been defined in numerous ways: Resilience is the ability to bounce back from adversity, frustration, and misfortune [16]. It is the developable capacity to rebound from adversity, conflict, failure, or even positive events, progress, and increased responsibility [17]. Resilience is the stable trajectory of healthy functioning after a highly adverse event [18]. A dynamic system can adapt successfully [19]. Resilience is the ability to be happy, successful, etc. again after something difficult or bad has

happened (The Cambridge Dictionary). Evidence suggests that resilient people have better mental health status and provide individuals with all the required qualities that enable them to successfully confront new challenges and difficulties in their lives [15].

The literature showed that perceived social support has a positive impact on resilience and that resilience is a strong protective factor against depression [20]. While resilience indicates a positive mental health status, an individual's mental health is also influenced by other components such as perceived social support and depressive symptoms, perceived social support influences mental health through the stress-buffering model, which enables individuals to redefine the potential harm caused by a situation and cushioning their perceived ability to cope with imposed demands, thereby preventing a particular situation from being perceived as stressful [21]. Gerber investigated whether mentally tough adolescents are resilient to stress, finding that mental toughness plays a mitigating role between high stress and depressive symptoms [22]. Individuals with high levels of resilience can cope more effectively with depression and anxiety.

A study by Brady, Hard and Gross tested whether a minimal reappraisal message embedded in an email from a course instructor could improve students' academic experience and performance in an introductory college course. The night before their first exam, students received an e-mail that either did or did not include a paragraph designed to lead them to interpret exam anxiety as beneficial or at least neutral. First-year students, who experience greater test anxiety and are less certain about how to perform well, benefited from the reappraisal message, showing decreased worry and increased performance on the exam the next day as well as increased performance in the course overall. Mediation analyses revealed that the effect on overall course performance for first-year students was partially mediated by reduced exam worry and enhanced performance on the first exam. The message did not affect the performance of upper-year students.

Krispenz A, et al. [10] pointed out that Test anxiety can impair learning motivation and lead to procrastination. Control-value theory of achievement emotions [4] assumes test anxiety to be a result of students' appraisals of the testing situation and its outcomes. Modification of cognitive appraisals such as low self-efficacy beliefs is thus assumed to reduce test anxiety and subsequent procrastination. In the present study, we tested the effects of an inquiry-based stress reduction (IBSR) intervention on students' academic self-efficacy, their test anxiety, and subsequent procrastination in the final stages of an academic term. Longitudinal

quasi-randomized intervention control trial. University students identified worry thoughts regarding a specific and frightening testing situation. Intervention participants (n= 40) explored their worry thoughts with the IBSR method. Participants of an active waitlist control group (n= 31) received the intervention after the study was completed. Dependent variables were assessed before and after the intervention as well as at the end of the term. Data-analyses revealed that the IBSR intervention reduced test anxiety as well as subsequent academic procrastination in comparison to the control group. The effect on test anxiety was partly due to an enhancement of self-efficacy. Our findings provide preliminary evidence that IBSR might help individuals to cope with their test anxiety and procrastination.

Yusefzadeh, et al. aimed to investigate the effect of study preparation on test anxiety and the performance of public health students. This quasi-experimental study investigated the effect of study preparation on reducing test anxiety and improving the performance of public health students at Urmia University of Medical Sciences, Urmia, Iran, in the academic year 2016-2017. All second and third-year bachelor's students in public health major were assigned to the intervention (n=20) and control groups (n=25). The assignment was based on the study preparation items and the defined benchmark. Data on general stress and test anxiety were collected by subjective self-assessment via paper-and-pencil surveys in the first week of the semester and before the final exam, respectively. No significant difference was found in the level of general stress between the two groups at the beginning of the semester (p=0.55) based on the study preparation items [23]. The level of test anxiety in the intervention group (47.90) was lower than in the control group (34.64) at the end of the semester (p=0.001). The mean value of exam scores was higher in the intervention group (p=0.015). The intervention reduced the level of test anxiety and improved the performance of students. Faculty members and heads of the departments should help students learn about the study preparation over the semester with engagement in learning- oriented approaches and class activities.

Schurink B, et al. [12] investigated the current study to achieve a more coherent picture of the relationship between test anxiety and physiological arousal, this systematic review and meta- analysis investigated whether higher self-reported test anxiety is associated with expected increases in objectively measured physiological arousal. A systematic literature search yielded an initial 231 articles, and a structured selection process identified 29 eligible articles, comprising 31 studies, which met the specified inclusion criteria and provided sufficient information about the relationship under investigation. In line with theoretical models, in 21 out of the 31 included studies, there was a significant positive relationship between self-reported test anxiety and physiological arousal. The strengths of these correlations were of medium size. Moderators influencing the relation between these two measures are discussed, along with implications for the assessment of physiological data in future classroom-based research on test anxiety.

Schurink B, et al. [12] investigated "Test Anxiety in Adolescent Students: Different Responses According to the Components of Anxiety as a Function of Sociodemographic and Academic Variables. A total of 1181 students from 12 to 18 years old (M = 14.7 and SD = 1.8) participated, of whom 569 were boys (48.2%) and 612 girls (51.8%). A sociodemographic questionnaire and the Questionnaire de Ansiedad ante los examenes-Adaptado (CAEX-A) [Test Anxiety Questionnaire-Adapted], an adaptation for Spanish secondary school levels (ESO) and Bachillerato, were administered. Girls scored higher on the cognitive and physiological components of TA than boys, with the intensity of the physiological response increasing with age. Bachillerato-level students reported more physiological anxiety than those at ESO-level. Students with better marks in the previous year presented more anxiety in the cognitive component, while those who obtained a lower mark presented higher anxiety values in the behavioural component. Participants reported that the types of tests that caused them more anxiety were oral tests in front of the class, oral presentations in front of a panel, and mathematics tests. Findings show that adolescents show a differential response to TA based on the physiological, cognitive, and motor components, mediated by the variables of gender, age, grade, academic performance, and type of exam. These results serve to design specific intervention programmes to manage anxiety in situations of academic assessment.

Methods

Correlation Research Design was used for this study. It is a type of design that looks at the relationships between two or more variables. Correlation research is done to establish what the effect of one on the other might be and how that affects the relationship. It is conducted to explain a noticed occurrence. In correlation research, the survey is conducted on a minimum of two groups. In most correlation research there is a level of manipulation involved with the specific variables being measured. Once the information is completed it is then analyzed mathematically to conclude the effect that one has on the other. In this study, I used a correlation research design. The sample consists of 280 participants. The sample was selected using an unrestricted self-selected survey. They were further classified according to gender (male and female) and stream of education (Civil, Mechanical, and Electrical) and were further compared to Test anxiety and Resilience.

The data was collected mainly using two psychological measures and a socio-demographic sheet. Westside test anxiety scale (WTAS). It is a brief 10 item instrument used to identify students with test anxiety [24]. Nicholson McBride Resilience questionnaire (NMRQ). It is a 12-item questionnaire designed to measure resilience [25]. The socio-demographic sheet was developed by the researcher. The questionnaire is composed of three parts- a socio-demographic data form, a Westside test anxiety scale, and a Nicholson McBride Resilience questionnaire. The questionnaire will be self-administering. The study was conducted through online platforms. Instructions will be printed at the beginning of the questionnaire. The first procedure is collecting data like age, gender, educational streams, etc. using a socio-demographic datasheet.

Statistical Techniques

The data obtained from the participants was analyzed as per the manual. Statistical tools like Karl Pearson Product Moment Correlation coefficient, Independent sample t-test, and ANOVA were used to analyse the data collected from the participants.

Result and Discussion

The first hypothesis states that there will be a significant relationship between test anxiety and resilience among engineering students. The relationship between the research variables was determined using the Karl-Pearson's product-moment correlation coefficient, which is displayed in Table 1. The value of r lies between +1 and -1. If it is positive, it means that the variables are positively correlated, which means that if one increases, the other increases as well. If the value is negative, the variables are said to be negatively linked, which means that when one variable increases, the other decreases. There is no relationship between the variables if the value is zero.

	Variables	1	2
1	Test anxiety	()	-0.13*
2	Resilience	..	()

*Significance at 0.05 level.
Table 1: Karl Pearson's product-moment correlation coefficient of Test anxiety and Resilience.

Table 1 result reveals that the relationship between test anxiety and resilience is -0.13, according to Karl Pearson's product moment analysis, where the value suggests that test anxiety and resilience have a negative correlation, indicating that the variables have an inverse relationship at a significance level of 0.03. Hence, the results thus show that developing resilience has an effect on lowering test anxiety levels; they also suggest that when a person attains low test anxiety, it indicates higher resilience, which enables individuals to overcome stress and achieve goals, and the students have an achievement motivation in associating their beliefs regarding the capacity to deal with test - related challenges. Additionally, a person with high test anxiety is likely to be less resilient, indicating difficulties in overcoming obstacles and stress before and during exams, which makes them feel quite anxious.

Roos LE, et al. [2] examined the relationship between test anxiety and the mediating effect of psychological resilience. The study here examined the relationship between psychological resilience and test anxiety. According to the study, exam anxiety increases a person's susceptibility to negative emotions like fear, helplessness, and rage, which results in psychological issues. Therefore, research has demonstrated a connection between test anxiety and psychological resilience. Therefore, the study's primary goal was to shed more light on the relationships between test anxiety and psychological resilience as well as to pinpoint the psychological processes that underlie test anxiety. The key conclusion demonstrates that resilience is significantly negatively correlated with test anxiety.

The second hypothesis states that there will be a significant difference in test anxiety based on gender. Independent sample t test was used to identify the difference between the study variables, and is shown in Table 2. The p-value is used to determine the significance in order to identify if there is any difference between the variables. The number of independent pieces of information used to calculate the statistic is called degrees of freedom. The t value is used to find out the significant difference between the two mean groups.

SL No	Variable	Male		Female		t	dt	p	Remark
		M1	SD1	M2	SD2				
1	Text Anxiety	28.50	10.94	27.44	10.40	0.83	278	0.40	NS

Table 2: Independent t test of test anxiety based on gender.

From the table, it can be observed that the mean score obtained by males for test anxiety is 28.50 and by females is 27.44 with a standard deviation of 10.94 and 10.40 respectively. The degrees of freedom in this analysis are 278 and the t-value obtained for test anxiety is 0.83. The significant value is 0.40. Typically, the significant value ranges from 0.01 to 0.05, here the p-value is high, indicating there is no significant difference in test anxiety based on gender. The result indicates there is no difference in test anxiety between genders. This suggests that test anxiety is a common occurrence for both men and women who have prepared for exams. They feel the same amount of anxiety before or during the exam, whether it is low or high.

Ahmad N, et al. [3] conducted the study to examine the relationship between test anxiety and academic achievement in undergraduate students and to assess the relationship from the perspective of gender. The study sample was made up of students from eight different departments at the University of Swat. The correlation value between students' CGPA and test anxiety was -0.317, indicating an opposite association between the two variables. Male students had an average CGPA of 2.8, while female students had an average CGPA of 3.19. Male undergraduate students' mean test scores were 3.25 and female undergraduate students were 3.13 with a p-value of 0.3. Students at undergraduate universities reported having a rather high level of test anxiety, and this was true of both male and female students.

The third hypothesis states that there will be a significant difference in resilience based on gender. Independent t-test was used to identify the relationship between the study variables, and is shown in Table 3. The p-value is used to determine the significance to identify if there is any difference between the variables. The number of independent pieces of information used to calculate the statistic is called degrees of freedom. The t value is used to find out the significant difference between the two mean groups.

SL NO	Variable	Male		Female		t	df	P	Remark
		M1	SD1	M2	SD2				
1	Resilience	41.99	9.33	41.9	9.04	0.09	278	0.93	NS

Table 3: The Independent student t-test of Resilience based on gender.

From the table, it can be observed that the mean score obtained by males for test anxiety is 41.99 and by females are 41.90 with a standard deviation of 9.33 and 9.04 respectively the degrees of freedom in this analysis are 278, and the t-value obtained for test anxiety is 0.83. The significant value is 0.93. Typically, the significant value ranges from 0.01 to 0.05, here the p-value is too high, indicating there is no significant difference in resilience based on gender. Here, the results show there is no difference between males and females based on resilience. This indicates that both genders show similar performances in resilience. Both males and females used different kinds of copying skills to deal with adversity; both genders have the ability or capacity to bounce back to a productive state through their own techniques. Above the result shows that both groups used their own skills to cope with their stress and anxiety during the exams.

The fourth hypothesis states that there will be significant differences in test anxiety on the basis of stream. One-way ANOVA is the statistical test used to find the difference between test anxiety and stream. Table 4 shows the results of ANOVA for test anxiety on the basis of stream. The sums of squares measure the variation in the data. The "between groups" sum of squares represents the variability between the different categories, while the "within groups" sum of squares represents the variability within each category. The total sum of squares is the sum of the between groups and within groups sums of squares. Mean squares are calculated by dividing the sum of squares by the degrees of freedom.

SL NO	Variables	Sum of squares		Mean sum of squares		F ratio	p
		Between	Within	Between	Within		
1	Test anxiety	1800.85	29976.91	900.43	108.22	8.32**	<0.001

**Significance at 0.01 level.
Table 4: ANOVA test result of test variables.

The F-Ratio is calculated by dividing the between-groups mean square by the within-group mean square. It assesses the ratio of the systematic variance between random variance within groups. The F-Ratio for test anxiety and stream is 8.32, which indicates that there is a significant difference in test anxiety based on stream. The sum of squares obtained for between groups and within groups is 1800.85 and 29976.91. The mean sum of squares for between groups and within

groups is 900.43 and 108.22 respectively. Three different engineering streams-civil, mechanical, and electrical-are the main focus of this study. According to the data, the individual's exam anxiety varies significantly depending on the stream they choose. In other words, the degree of exam anxiety varied depending on the person's stream preference.

It is evident from Table 5 that test anxiety will vary significantly depending on stream. Therefore, a post hoc test was employed to determine precisely which groups differed from one another. The particular difference between these pairs of means is measured using Duncan's Multiple Range Test (DMRT). The table suggest that groups differ depending on their respective stream. Civil (24.65) and Mechanical (28.69) had distinct results, indicating that both groups face varying levels of anxiety- related stress as a result of their test or performance. There have also been variations between the groups in the cases of Civil (24.65) and Electrical (30.70), indicating that there are two levels of stress brought on by their anxiety. It implies that, depending on the academic path they choose, pupils' test anxiety varies. While there is no significant difference between Civil (24.65) and Mechanical (30.70), suggests that both students suffer a comparable amount of test anxiety.

SL No	Variables	N	Mean	1	2	3
1	Civil	96	24.65	()	*	*
2	Mechanical	91	28.69		()	..
3	Electrical	93	30.7			()

*Significance at 0.05 level.
Table 5: The result of post hoc test of Test Anxiety based on the stream of their study.

One-way ANOVA is the statistical test used to find the difference between test anxiety and stream. Table 6 shows the results of ANOVA for resilience on the basis of stream. The sums of squares measure the variation in the data. The "between groups" sum of squares represents the variability between the different categories, while the "within groups" sum of squares represents the variability within each category. The total sum of squares is the sum of the between groups and within groups sums of squares. Mean squares are calculated by dividing the sum of squares by the degrees of freedom.

SL NO	Variables	Sum of squares		Mean sum of squares		F ratio	p
		Between	Within	Between	Within		
1	Resilience	1548.46	21911.72	774.23	79.1	9.79**	<0.001

**Significance at 0.01 level.
Table 6: ANOVA test result of Resilience based on the stream.

The F-Ratio is calculated by dividing the between-groups mean square by the within- group mean square. It assesses the ratio of the systematic variance between random variance within groups. The F-Ratio for test anxiety and stream is 9.79, which indicates that there is significant difference in resilience on the basis of stream. The sum of squares obtained for between groups and within groups is 1548.46 and 774. 23. The mean sum of squares for between groups and within groups is 774.23 and 79.10 respectively. The table makes it obvious that students' levels of resilience vary depending on the stream they choose to study in. It is evident that each group of students employs a unique set of coping mechanisms to manage the stress and anxiety brought on by exams and assignments.

From the Table 7 it is clear that there will be a significant difference in resilience based on stream. Hence post hoc-test was used to identify exactly which group differ each other. Here Duncan's Multiple Range Test (DMRT) is used to measure specific difference between pairs of means.

SL No	Variables	N	Mean	1	2	3
1	Civil	96	43.68	()	--	*
2	Mechanical	91	43.53		()	*
3	Electrical	93	38.61			()

*Significance at 0.05 level.
Table 7: The post hoc test result of Resilience based on the stream.

The results indicate that there is a difference among groups based on their respective streams. There is a difference in civil (43.68) and electrical (38.61), indicating their coping styles differ from each other. They use different strategies or methods to overcome their stress levels and anxiety-related stresses. And in the case of Mechanical (43.53) and Electrical (38.61), there have been differences between the groups. That their resilience skills are used at a different level. While in the case of Civil (43,68) and Mechanical (38.61), there is no noticeable difference, so indicating that they have a similar level of coping skills.

Summary and Conclusion

The present study was conducted to examine Test Anxiety and Resilience among Engineering students. The main focus point of the study is the relationship between test anxiety and resilience. This study was conducted through the participants of 280 engineering students in Kerala who had been administered by Westside Test Anxiety scale and Nicholson McBride Resilience questionnaire. The Westside Test Anxiety scale developed by Driscoll was designed to identify students with anxiety impairments who could benefit from an anxiety reduction intervention. Nicholson McBride Resilience questionnaire developed by Nicholson was designed to assess the ability of individuals to cope with stress and adversity in their lives. The results indicate that there is significant relationship between test anxiety and resilience.

Findings

- Test anxiety was found to be in an inverse relationship with Resilience, which indicate that when test anxiety increases Resilience decreases.
- No major difference was found between the test anxiety and Resilience based on gender.
- Test anxiety level creates a difference among engineering students based on the stream of their study; the test anxiety of electrical students was higher as compared to Civil and mechanical students.
- Resilience creates a difference among engineering students based on the stream of their study; the Resilience level of civil and mechanical students was higher as compared to electrical students.

Implications of the Study

The present study was designed to understand and find out the relationship between test anxiety and resilience among engineering students. It Is hoped that the study will stimulate enthusiastic investigators to undertake future research programs that may further illuminate this area. The study found that there is a significant difference in resilience among engineering students based on their stream. The study can provide insights into effective strategies for managing test anxiety and building resilience among students [26]. It may identify techniques such as relaxation exercises; cognitive restructuring, time management, and goal setting that can help individuals cope with test-related stress and perform better in exams. The resilience level of civil and mechanical engineering is high as compared to electrical engineering, which indicates that their capacity to deal with all the stress related to academics is low. So, awareness classes or motivational classes can be implemented to engage the students in coping with all the stresses.

Suggestions

It is better to consider other streams to get more comprehensive knowledge about the influence of the study variables on students. Besides, all data were gathered employing questionnaires, which are prone to response bias. A multi-method approach is, hence, expected to be employed in future studies. The enrollment of more participants, leading to larger samples, may extract more generalized findings of great interest. There should be given more time and incentive to conduct the study.

Limitations

- This study took samples from a limited stream. It would be better to take samples from different streams to get more knowledge regarding the study variables.
- The study has been limited to a few districts of Kerala so the generalization of findings is less.
- Some participants may report answers in a way they deem to be socially acceptable than would be their 'true' answers.
- This study takes into consideration students. It would be better to take other age groups to get more comprehensive knowledge of the topic.
- In this study, data was collected using online methods. Hence, there is a possibility [27].
- That the participants may not provide genuine responses due to his/her lack of commitment towards the study.

References

1. Brady ST, Hard BM, Gross JJ (2018) Reappraising Test Anxiety Increases Academic Performance of First-Year College Students. J Educ Psychol 110(3): 395-406.

2. Roos LE, Salisbury M, Penner-Goeke L, Cameron EE, Protudjer JL, et al. (2021) Supporting Families to Protect Child Health: Parenting Quality and Household needs during the COVID-19 Pandemic. PloS One 16(5): e0251720.

3. Ahmad N, Hussain S, Khan FN (2018) Test Anxiety: Gender and Academic Achievements of University Students. J Postgrad Med Inst 32(3): 295-300.

4. Pekrun R (2006) The Control-Value Theory of Achievement Emotions: Assumptions, Corollaries, and Implications for Educational Research and Practice. Educ Psychol Rev 18(4): 315-341.

5. Quinn BL, Peters A (2017) Strategies to Reduce Nursing Student Test Anxiety: A Literature Review. J Nurs Educ 56(3): 145-151.

6. Siebert A (2009) The Resiliency Advantage: Master Change, Thrive under Pressure, and Bounce back from Setbacks. Berrett-Koehler Publishers.

7. Southwick SM, Bonanno GA, Masten AS, Panter-Brick C, Yehuda R (2014) Resilience Definitions, Theory, and Challenges: Interdisciplinary Perspectives. Eur J Psychotraumatology 5(1): 25338.

8. Youssef CM, Luthans F (2007) Positive Organizational Behavior in the Workplace: The Impact of Hope, Optimism, and Resilience. J Manag 33(5): 774-800.

9. Zeidner M (2007) Test Anxiety in Educational Contexts: Concepts, Findings, and Future Directions. Emotion in Education, Educational Psychology, pp: 165-184.

10. Krispenz A, Gort C, Schultke L, Dickhauser O (2019) How to Reduce Test Anxiety and Academic Procrastination through Inquiry of Cognitive Appraisals: A Pilot Study Investigating the Role of Academic Self-Efficacy. Front Psychol 10: 1917.

11. Sarason IG, Sarason BR (1986) Experimentally Provided Social Support. J Pers Soc Psychol 50(6): 1222-1225.

12. Schurink B, Roos E, Radonic T, Barbe E, Bouman CS, et al. (2020) Viral Presence and Immunopathology in Patients with Lethal COVID-19: A Prospective Autopsy Cohort Study. Lancet Microbe 1(7): e290-e299.

13. Liebert RM, Morris LW (1967) Cognitive and Emotional Components of Test Anxiety: A Distinction and Some Initial Data. Psychological Reports 20(3): 975-978.

14. Rost DH, Schermer FJ (1989) The Assessment of Coping with Test Anxiety. Personality Psychology 6: 179-191.

15. Stangier, Clark, Ehlers (2006) Test Anxiety is the Reaction to Stimuli Associated with a Person's Experience of a Test or Evaluation Procedure.

16. Miller (2011) Test Anxiety Refers to the Subjective Experience.

17. Banks J, Smyth E (2015) Your Whole Life Depends on It: Academic Stress and High-Stakes Testing in Ireland. J Youth Stud 18(5): 598-616.

18. Bonaccio S, Reeve CL (2010) The Nature and Relative Importance of Students' Perceptions of the Sources of Test Anxiety. Learn Individ Differ 20(6): 617-625.

19. Bystritsky A, Kronemyer D (2014) Stress and Anxiety: Counterpart Elements of the Stress/Anxiety Complex. Psychiatr Clin North Am 37(4): 489-518.

20. Cuomo C, Sarchiapone M, Di Giannantonio M, Mancini M, Roy A (2008) Aggression, Impulsivity, Personality Traits, and Childhood Trauma of Prisoners with Substance Abuse and Addiction. Am J Drug Alcohol Abuse 34(3): 339-345.

21. Hargreaves A (2001) The Changing Nature of Teachers' Professionalism in a Changing World. New Teach Educ Future Int Perspect 2001: 89-107.

22. Morris LW, Liebert RM (1969) Effects of Anxiety on Timed and Untimed Intelligence Tests: Another Look. J Consult Clin Psychol 33(2): 240-244.

23. Naveh-Benjamin M (1987) Coding of Spatial Location Information: An Automatic Process? J Exp Psychol Learn Mem Cogn 13(4): 595-605.

24. Remesal A, Brown GTL (2015) Conceptions of Assessment When the Teaching Context and Learner Population Matter: Compulsory School versus Non-Compulsory Adult Education Contexts. Eur J Psychol Educ 30(3): 331-347.

25. Rodriguez C, Gonzalez-Castro P, Garcia T, Nunez JC, Alvarez L (2014) Attentional Functions and Trait Anxiety in Children with ADHD. Learn Individ Differ 35: 147-152.

26. Spielberger CD, Anton WD, Bedell J (2015) The Nature and Treatment of Test Anxiety. In: Zuckerman M, et al. (Eds.), Emotions and Anxiety: New Concepts, Methods, and Applications, Lawrence Erlbaum, pp: 317-345.

27. Meijer J (2001) Learning Potential and Anxious Tendency: Test Anxiety as a Bias Factor in Educational Testing. Anxiety Stress Coping 14(3): 337-362.