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Original Article

Evaluation of subjects with exam anxiety and healthy controls using the Beier Sentence Completion Test as a projective method: a different perspective on the causes of exam anxiety

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ABSTRACT

Objective: The aim of this study was to identify factors associated with exam anxiety that may contribute to exam anxiety in children and adolescents who present to the clinic. Additionally, this study planned to compare the attitudes and behavior dynamics of individuals with exam anxiety and co-occurring psychiatric disorders with those who have isolated exam anxiety using the Beier Sentence Completion Test (BCT).

Material and Methods: The study sample consisted of girls and boys aged 8-18 who presented to the Child and Adolescent Psychiatry Outpatient Clinic of Health Sciences University Ankara Training and Research Hospital between January 1, 2019, and December 31, 2019, with complaints of exam anxiety. The BCT, the Children's Anxiety Disorder Screening Scale (SCARED), and the Children's Depression Scale (SCARED) were administered to the patients.

Results: The BCT-negative total score of the exam anxiety and comorbid diagnosis group was significantly higher than that of the control group ($p=0.001$). The BCT-neutral total score of the exam anxiety and comorbid diagnosis group was significantly lower than the control group ($p<0.001$). The distribution of the BCT self- and ability-related attitude in the exam anxiety group was significantly more negative ($p=0.008$). The distribution of the BCT attitude toward the mother in the exam anxiety group was significantly more negative ($p=0.012$).

Conclusion: Exam anxiety is a common public mental health issue in Türkiye, a country where exams and testing are frequent. Children and adolescents with exam anxiety tend to interpret external stimuli more negatively, with neutral interpretations being less frequent. The negative evaluation of one's self and abilities is an important factor that clinicians should consider. The negative attitude toward the mother in relation to parental attitudes emphasizes the role of parental attitudes in exam anxiety.

Keywords: Anxiety, Exam, Projective Techniques

INTRODUCTION

Exam anxiety is a prevalent issue that significantly impacts students' academic performance and mental health. It is defined as a psychological condition involving emotional, physiological, and behavioral responses to the perceived negative consequences of upcoming exams. This intense anxiety can impair a student's ability to effectively use their knowledge and skills, resulting in reduced performance. When disproportionate to the situation, it interferes with decision making processes, studying, and information recall, thereby affecting an individual's overall functioning (1).

Current research suggests that high test anxiety affects between 15% and 22% of the student population (2,3). Considering the early exposure to high-stakes testing in the Turkish educational system, exam anxiety represents a significant child and adolescent mental health concern, negatively influencing their social, emotional, and cognitive development, as well as their self-perception and academic identity (4). The etiology of exam anxiety is multifactorial, encompassing individual traits and environmental factors. Personal characteristics such as fear of failure, perfectionism, excessive worry, poor coping skills, and low self-esteem contribute significantly (5,6). External pressures, particularly from parents and social comparisons,

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are also influential. Parental attitudes are frequently emphasized in the literature as significant contributors to performance-related anxiety. Authoritarian parenting marked by strict rules and high expectations has been linked to elevated anxiety levels, whereas democratic parenting is associated with lower anxiety (6). Projective techniques are advantageous in revealing unconscious emotional processes that standard self-report inventories may fail to capture. Unlike traditional self-report scales, projective methods like BCT allow for a more indirect and nuanced assessment by interpreting the individual's spontaneous responses, offering a deeper clinical understanding (7). While the use of projective tools such as BCT is established in clinical settings for assessing internalizing and externalizing disorders, their application in evaluating exam anxiety remains limited. However, recent studies have begun to highlight the potential of projective tools in educational contexts to uncover subtle emotional patterns that are not easily accessed through direct questioning (8). For example, Koç et al. (8) demonstrated that BCT could effectively distinguish between adolescents with internalizing versus externalizing disorders and correlated well with self-reported anxiety and depressive symptoms. These findings suggest the relevance and utility of BCT in understanding the emotional and psychological dimensions of exam anxiety.

The primary aim of this study was to explore the psychological and emotional factors contributing to exam anxiety using the Beier Sentence Completion Test in a clinical sample of children and adolescents. Additionally, this study sought to compare the emotional and behavioral profiles of individuals with exam anxiety with and without comorbid psychiatric conditions to those of healthy controls. Our hypothesis was as follows: Children and adolescents diagnosed with exam anxiety will obtain significantly higher total negative scores on the Beier Sentence Completion Test compared to healthy controls. Additionally, among participants with exam anxiety, those with comorbid psychiatric diagnoses will exhibit higher levels of negative responses, particularly in the domains of family relationships and self-concept, compared to those with only exam anxiety.

MATERIALS and METHODS

The sample of this study consisted of male and female subjects aged 8 to 18 years who presented to the Child and Adolescent Psychiatry Outpatient Clinic of Health Sciences University Ankara Training and Research Hospital between January 1, 2019, and December 31, 2019, with complaints of exam anxiety. No comorbid physical illnesses were present among the participants included in the study. The results of the Beier Sentence Completion Test (BCT), the Children's Anxiety Disorder Screening Scale (SCARED), and the Children's Depression Scale (CDI) were accessed from the hospital's database. Comorbid psychiatric disorders were identified by the principal investigator, and the diagnoses were made retrospectively based on DSM-5 criteria. The control group consisted of children who applied for consultation in child and adolescent psychiatry but did not have a current psychiatric disorder diagnosis. Similarly, the children included in the control group did not have any physical illnesses. Moreover, no additional psychiatric disorders, including test anxiety, were present. Individuals with autism spectrum disorder, intellectual disability, or bipolar disorder were excluded from both the patient and control groups.

Beier Sentence Completion Test (BCT):

BCT is one of the projective tests commonly used in clinical practice (9). BCT is a semi-structured projective test consisting of incomplete sentences. The patient is asked to read the incomplete sentences and complete them according to their first thoughts. Its importance in the diagnostic and treatment process is heightened by its ease of use, low cost, no requirement for a certain level of education, and its ability to provide valuable additional information for psychiatric formulations. This test reflects their interests, attitudes, desires, expectations, problems, feelings, and thoughts. Each sentence in the scale expresses a behavioral dynamic. These behavioral dynamics are grouped into 11 subcategories (attitudes towards the past, attitudes towards the future, self-confidence and attitudes towards abilities/self-esteem and attitudes towards one's own abilities, attitude towards the mother, attitude towards the father, attitude towards home and family, attitude towards friends, behavior towards authority, fears and anxieties, feelings of guilt, attitude towards school and work). Interpretation of the test is evaluated by processing the analysis form. For each sentence, the value is determined as positive, negative, or neutral based on the emotional charge of the response provided by the individual. This was conducted by a second researcher who was blind to group allocation (case or control). Accordingly, sentences are marked as positive (e.g., "The best fathers are mine"), negative (e.g., "There cannot be good fathers"), or neutral (e.g., "There are both good and bad fathers"), and coded as (+), (-), or (0), respectively. Additionally, the total number of unanswered sentences is reported. In this study, the number of unanswered sentences for each subcategory was also analyzed. To minimize this bias, a second researcher independently scored the responses in a blinded manner, and the results were subsequently reviewed with the principal investigator.

Children's Depression Inventory (CDI):

The CDI is a 27-item self-report scale designed for children aged 6-17 years. The Turkish validity and reliability study was conducted by Oy (11). The test-retest reliability of the scale is 0.80, and the Cronbach alpha internal consistency coefficient is 0.77. The cutoff score for the scale is 19 (11).

The Screen for Child Anxiety Related Disorders (SCARED):

This scale consists of 41 items designed to assess anxiety in children. It is a self-report tool, with each item scored based on

the severity of the symptoms, using a scale of 0, 1, or 2 points. The recommended cutoff score is 25, which is considered indicative of an anxiety disorder. The Turkish validity study was conducted by Çakmakçı (10). The Cronbach alpha reliability values for the overall scale and subscales range from 0.88 to 0.91 (10).

Statistical analysis

IBM SPSS Statistics for Windows version 21.0 (Armonk, NY: IBM Corp., 2012) was used for statistical analysis. Categorical variables are expressed as frequency (n) and percentage (%). The normality of continuous variables was tested using the Kolmogorov-Smirnov test and is presented as mean and standard deviation. For the comparison of continuous variables between two groups, Student's t-test was used. Categorical variables were analyzed using Pearson's χ^2 and Fisher's exact tests. Pearson correlation analysis was used for SCARED Scales with BCT Subscale Totals. A significance level of $p<0.050$ was accepted.

RESULTS

The average age of the total 99 subjects was 12.1±2.7 years. The study sample consisted of 72 participants in the patient group and 27 participants in the control. The two groups were found to be similar in terms of age, gender, and educational level distribution (p=0.359, p=0.580, p=0.243 respectively, see Table I).

In the exam anxiety group (n=72), only subjects with exam anxiety represented 51.4% of the entire group (n=37), while 49.6% (n=35) had a comorbid DSM-5 diagnosis in addition to exam anxiety. Among these subjects, 29.2% (n=21) had a comorbid anxiety disorder (e.g., generalized anxiety disorder, panic disorder, etc.), 9.7% (n=7) had other comorbid disorders (e.g., tics, borderline intellectual functioning, PTSD, somatization), 5.6% (n=4) had obsessive-compulsive disorder (OCD), and 4.2% (n=3) had depression. In the scale score comparison, the CDI scores were found to be similar between the two groups (p=0.097), while the mean score of the SCARED scale was significantly higher in the anxiety group (Table II).

Analysis of the Beier Sentence Completion Test (BCT)

This test was used to examine various psychological attitudes and reactions between a group with exam anxiety and a control group. The results indicate significant differences between the two groups, with the exam anxiety group showing higher anxiety levels and more negative attitudes in various psychological areas.

BCT-Total Results:

The exam anxiety group showed a significantly higher negative mean in BCT total compared to the control group (21.2 vs. 14.3; p<0.001 The exam anxiety group had a significantly lower neutral mean in BCT total compared to the control group (10.7 vs. 21.4; p<0.001). The exam anxiety group showed a significantly higher unanswered mean in BCT total compared to the control group (6.7 vs. 2.4; p=0.016) (Table III).

Attitudes Toward the Past:

The exam anxiety group had a significantly higher negative mean regarding attitudes toward the past compared to the control group (2.1 vs. 1.4; p=0.007). The exam anxiety group showed a significantly lower neutral mean regarding attitudes toward the past compared to the control group (0.8 vs. 2.4; p<0.001). The exam anxiety group had a significantly higher unanswered mean in attitudes toward the past compared to the control group (0.6 vs. 0.1; p=0.010) (Table III).

Table I: Comparison of demographic and clinical scale data according to the presence of comorbid psychiatric disorders in children and adolescents presenting with exam anxiety

	Total n = 99	Exam anxiety n = 72	Control n = 27	Statistics t or χ^2	p
Age (year)*	12.1±2.7	12.2±2.7	11.6±2.5	0.921	0.359†
Gender‡					
Girl	64 (64.6)	51 (70.8)	13 (48.1)	4.421	0.058§
Boy	35 (35.4)	21 (29.2)	14 (51.9)		
Education‡					
Primary school	31 (31.3)	21 (29.2)	10 (37.0)	2.826	0.243§
Middle school	37 (37.4)	25 (34.7)	12 (44.4)		
High school	31 (31.3)	26 (36.1)	5 (18.5)		
Comorbidty‡					
No	27 (27.3)	NA	27 (100.0)	NA	NA
Exam Anxiety	37 (37.4)	37 (51.4)	0		
Exam Anxiety + The other anxiety disorder	21 (21.3)	21 (29.2)	0		
Exam Anxiety + Depression	3 (3.0)	3 (4.2)	0		
Exam Anxiety + Obsessive Compulsive Disorder	4 (4.0)	4 (5.6)	0		
Exam Anxiety + The other Scales	7 (7.1)	7 (9.7)			

***:** mean±SD, **†:** Student-t test, **‡:** n(%), **§:** Pearson chi-square test, **NA:** not-applicable*

Table II: The anxiety and depression scale scores of the exam anxiety and control groups.

	Total	Exam anxiety	Control	Statistics	
				t	p*
CDI†	34.8±9.5)	33.8±9.3	37.4±9.9	-1.677	0.097
SCARED†	33.2±17.4	37.2±17.0	22.8±14.1	3.901	<0.001

: Student-t test, †: mean±SD, **NA: not-applicable, **CDI:** Children's Depression Inventory, **SCARED:**The Screen for Child Anxiety Related Disorders*

Attitudes Toward the Future:

The exam anxiety group had a significantly higher positive mean in attitudes toward the future compared to the control group (1.9 vs. 1.1; p=0.005). The exam anxiety group showed a significantly higher negative mean in attitudes toward the future compared to the control group (1.0 vs. 0.3; p=0.001). The exam anxiety group had a significantly lower neutral mean in attitudes toward the future compared to the control group (1.7 vs. 3.3; p=0.001) (Table III).

Attitudes Toward the Self and Personal Abilities:

The exam anxiety group exhibited a significantly higher negative mean in attitudes toward the self and personal abilities compared to the control group (2.4 vs. 1.4; p=0.002). The exam anxiety group showed a significantly lower neutral mean in attitudes toward the self and personal abilities compared to the control group (1.0 vs. 2.2; p=0.000) (Table III).

Attitudes Toward the Mother:

The exam anxiety group had a significantly lower positive mean in attitudes toward the mother compared to the control group (1.8 vs. 2.4; p=0.019). The exam anxiety group showed a significantly higher negative mean in attitudes toward the mother compared to the control group (2.1 vs. 1.3; p=0.002). The exam anxiety group had a significantly lower neutral mean in attitudes toward the mother compared to the control group (0.1 vs. 0.7; p<0.001) (Table III).

Other Attitudes (Toward Father, Family, Friends, etc.):

Attitudes Toward Father: The exam anxiety group showed a significantly lower neutral mean in attitudes toward their fathers, while the unanswered mean was significantly higher.

Attitudes Toward Home and Family: The exam anxiety group showed a significantly higher negative mean and a lower neutral mean in attitudes toward home and family.

Attitudes Toward Friends: The exam anxiety group had a higher negative mean toward friends, and a significantly lower neutral mean compared to the control group.

Attitudes Toward Authority: The exam anxiety group showed a significantly lower neutral mean in their approach toward authority, but a higher unanswered mean.

Attitudes Toward Guilt: The exam anxiety group had a significantly lower neutral mean and a higher unanswered mean in their approach toward guilt.

Attitudes Toward School: The exam anxiety group showed a significantly higher negative mean and a lower neutral mean in attitudes toward school.

Correlation Analysis

A weak negative correlation was found between the CDI score and the total scores of the Beier Sentence Completion Test in children and adolescents with exam anxiety (n=72), specifically between the BCT-Positive Total Score (r=0.363, p=0.003) (see Table IV).

In children and adolescents with exam anxiety (n=72), a weak negative correlation was observed between the SCARED score and the total scores of the Beier Sentence Completion Test, specifically between the BCT-Positive Total Score (r=0.387, p= 0.001). Additionally, a moderate positive correlation was found between the BCT-Negative Total Score (r=0.440, p<0.001).

When the total and subscale scores of the BCT test were compared by gender in children and adolescents with exam anxiety, it was found that the self-perception and positive attitude towards own abilities of girls with exam anxiety were significantly lower than those of boys (2.2 vs. 1.5; t=2.184, p=0.033). All other variables were found to be similar between the two genders (for all, p>0.050, not shown in the table).

DISCUSSION

Exam anxiety is a heterogeneous disorder with many factors in its etiology. Researchers agree on two main categories when discussing the causes of exam anxiety. It is known that young people who experience difficulties in additional study and learning skills are more likely to experience exam anxiety. The reason for this is that, in order to recall the necessary information during the exam, the information has not been sufficiently internalized, and as a result of this cognitive effort during the exam, the person experiences anxiety. In this case, the main issue is not the exam itself but rather the inadequacies in the preparation process leading up to it. The second most important cause of exam anxiety is the negative, anxiety-triggering thoughts that arise in a person's mind during the exam and the difficulty in coping with these thoughts. The foundations of these negative thoughts can stem from a variety of psychological, social, familial, and environmental factors, such as personality traits, external expectations, the person's attitudes towards themselves (either positive or negative), and their self-efficacy, along with the interactions between these factors. This study aimed to assess various aspects of individuals, including their attitudes towards themselves, their parents, life, and the environment, as well as their self-esteem, in order to identify the factors that contribute to exam anxiety.

Table III: Comparison of beier sentence completion (bct) total and subscale scores of children and adolescents with exam anxiety to the control group

Scale*	Total n = 99	Exam anxiety n = 72	Control n = 27	Statistics	
				t	p†
BCT-Total					
Positive (+)	17.4±6.2	17.2 ±6.8	17.7 ±4.3	-0.337	0.737
Negative (-)	19.2±8.2	21.2 ±8.5	14.3 ±4.7	3.932	0.000
Neutral (0)	13.8 ±7.9	10.7 ±5.9	21.4 ±7.1	-7.518	0.000
Not Response	5.5 ±7.9	6.7 ±8.6	2.4 ±4.2	2.458	0.016
Attitude towards the Past					
Positive (+)	1.2 ±1.0	1.3 ±1.0	0.9 ±0.8	1.605	0.112
Negative (-)	1.9 ±1.1	2.1 ±1.1	1.4 ±1.1	2.769	0.007
Neutral (0)	1.3 ±1.3	0.8 ±0.8	2.4 ±1.5	-6.298	0.000
Not Response	0.4 ±0.8	0.6 ±0.9	0.1 ±0.4	2.622	0.010
Attitude towards the Future					
Positive (+)	1.7 ±1.2	1.9 ±1.1	1.1 ±1.1	2.910	0.005
Negative (-)	0.8 ±0.8	1.0 ±0.7	0.3 ±0.8	3.465	0.001
Neutral (0)	2.2 ±1.5	1.7 ±1.2	3.3 ±1.6	-5.257	0.000
Not Response	0.2 ±0.6	0.2 ±0.6	0.1 ±0.4	1.063	0.291
Attitude towards Self and Own Abilities					
Positive (+)	1.8 ±1.1	1.7 ±1.1	2.0 ±1.1	-1.119	0.266
Negative (-)	2.2 ±1.4	2.4 ±1.4	1.4 ±1.0	3.211	0.002
Neutral (0)	1.3 ±1.2	1.0 ±1.0	2.2 ±1.1	-4.698	0.000
Not Response	0.5 ±1.0	0.6 ±1.1	0.2 ±0.6	1.859	0.066
Attitude towards Mother					
Positive (+)	2.0 ±1.0	1.8 ±1.1	2.4 ±0.9	-2.383	0.019
Negative (-)	1.9 ±1.1	2.1 ±1.1	1.3 ±1.0	3.030	0.003
Neutral (0)	0.3 ±0.6	0.1 ±0.3	0.7 ±0.8	-4.913	<0.001
Not Response	0.7 ±1.1	0.8 ±1.2	0.4 ±1.0	1.329	0.187
Attitude towards Father					
Positive (+)	1.7 ±1.2	1.6 ±1.3	2.0 ±1.0	-1.456	0.149
Negative (-)	1.8 ±1.3	2.0 ±1.4	1.5 ±0.9	1.493	0.139
Neutral (0)	0.5 ±0.9	0.4 ±0.8	1.0 ±1.1	-2.661	0.009
Not Response	0.7 ±1.1	0.9 ±1.2	0.4 ±0.8	2.011	0.047
Attitude towards Home and Family					
Positive (+)	2.6 ±1.2	2.6 ±1.2	2.5 ±1.2	0.069	0.945
Negative (-)	0.7 ±0.9	0.8 ±1.0	0.3 ±0.6	2.249	0.027
Neutral (0)	1.3 ±1.0	1.1 ±0.8	1.8 ±1.1	-3.581	0.001
Not Response	0.3 ±0.7	0.4 ±0.7	0.2 ±0.8	1.254	0.231
Attitude towards Friends					
Positive (+)	2.2 ±1.0	2.2 ±1.1	2.2 ±1.0	-0.202	0.841
Negative (-)	1.0 ±1.0	1.2 ±1.0	0.6 ±0.7	2.870	0.005
Neutral (0)	1.3 ±1.0	1.1 ±1.0	1.8 ±1.0	-2.955	0.004
Not Response	0.3 ±0.6	0.3 ±0.6	0.2 ±0.5	0.867	0.388
Attitude towards Authority					
Positive (+)	1.4 ±1.0	1.3 ±1.1	1.4 ±0.9	-0.384	0.702
Negative (-)	1.8 ±1.0	1.9 ±1.1	1.7 ±1.0	0.651	0.517
Neutral (0)	1.1 ±0.9	0.9 ±0.9	1.5 ±0.9	-2.656	0.009
Not Response	0.5 ±1.0	0.6 ±1.1	0.1 ±0.3	2.565	0.012
Attitude towards Fear and Anxiety					
Positive (+)	0.3 ±0.6	0.3 ±0.6	0.2 ±0.6	0.770	0.443
Negative (-)	3.0 ±1.3	3.1 ±1.3	2.7 ±1.1	1.426	0.157
Neutral (0)	1.3 ±1.1	1.0 ±1.0	1.8 ±1.1	-3.277	0.001
Not Response	0.3 ±0.7	0.4 ±0.8	0.1 ±0.5	1.468	0.146
Attitude towards Guilt					
Positive (+)	0.4 ±0.6	0.4 ±0.6	0.5 ±0.5	-0.696	0.488
Negative (-)	2.4 ±1.2	2.6 ±1.2	1.9 ±1.0	2.534	0.013
Neutral (0)	1.2 ±1.1	0.8 ±0.8	2.2 ±1.1	-6.836	<0.001
Not Response	0.8 ±1.1	1.1 ±1.2	0.2 ±0.5	3.512	0.001

Scale*	Totaln = 99	Exam anxiety n = 72	Control n = 27	Statistics	
				t	p†
Attitude towards School					
Positive (+)	1.8 ±1.2	1.8 ±1.1	2.0 ±1.4	-0.812	0.419
Negative (-)	1.2 ±1.1	1.5 ±1.1	0.7 ±0.7	3.310	0.001
Neutral (0)	1.6 ±1.1	1.3 ±1.0	2.2 ±1.3	-3.312	0.001
Not Response	0.2 ±0.6	0.3 ±0.7	0.0 ±0.1	1.853	0.067

:** *mean±SD,* **†:** *Student-t test,* ***NA: *not-applicable*

Table IV: Pearson correlation analysis of scared scales with bct subscale totals in the exam anxiety group (n = 72)

	BCT – Pozitive Total	BCT – Negative Total	BCT – Neutral Total	BCT – Not Response Total
CDI				
r*	-0.363	0.217	0.099	0.006
p	0.003	0.077	0.426	0.961
SCARED				
r*	-0.387	0.440	0.056	-0.165
p	0.001	<0.001	0.656	0.185

:** *Pearson Correlation Analysis,* ***BCT: *Beier Sentence Completion Test,* ***CDI:*** *Children's Depression Inventory,* ***SCARED:*** *The Screen for Child Anxiety Related Disorders*

Exam anxiety is not defined as an independent psychiatric disorder in the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th Edition) diagnostic system. However, exam anxiety is often associated with anxiety disorders, particularly generalized anxiety disorder or social anxiety disorder. The DSM-5 addresses such anxieties within the broader framework of anxiety disorders, but there is no specific diagnostic category for exam anxiety. Both individuals with only exam anxiety and those with an additional diagnosis alongside exam anxiety obtained significantly higher total negative scores on the BCT scale open compared to the control group. Additionally, when the distribution of total neutral scores was examined, both groups were found to have significantly lower scores than the control group. In other words, individuals with exam anxiety tend to have higher negative interpretation scores and lower neutral interpretation scores. This may provide important data in terms of highlighting the significance of the impact of adverse environmental factors in individuals with exam anxiety. Furthermore, it should be noted that the tendency of individuals with exam anxiety to interpret environmental factors negatively and report fewer neutral situations may also be a result of cognitive bias. The group with exam anxiety showed a higher rate of negative past-event interpretation compared to both the control group and the group with exam anxiety and comorbid disorders. The cognitive bias of "negative past event interpretation" or the tendency of an individual to continuously interpret past experiences in a negative light, has most commonly been studied in the context of major depression. Specifically, Beck's original cognitive model of depression explains how negative cognitive biases are prevalent across the past, present, and future, highlighting the connection between these biases and depression. Additionally, literature suggests that individuals with anxiety disorders may also exhibit a higher tendency to interpret the past negatively, a phenomenon referred to as "negative memory bias" (12-14). However, none of these studies focused specifically on individuals with exam anxiety. Upon reviewing the literature, this study is the first to identify negative past-event interpretation in individuals with exam anxiety, which is considered important for clinicians.

While it is easily predictable that individuals with exam anxiety focus on potential negative outcomes related to future exams, the finding that these individuals also exhibit a negative bias toward past experiences and prior events is significant. In comparing the two groups, the exam anxiety group had a significantly higher average negative attitude toward the future compared to the control group. In children and adolescents with exam anxiety, it should be kept in mind that anxiety disorders are often associated with selective focus on the future, excessive generalization, catastrophizing, and all-or-nothing thinking, which are all forms of negative evaluation.

In the group with exam anxiety, the negative attitude towards the self and one's abilities was found to be significantly higher compared to the control group. The literature also indicates a significant negative relationship between self-esteem and exam anxiety (15). In a comprehensive meta-analysis conducted by Nathaniel von der Embse and colleagues, which compiled 238 studies, it was concluded that self-esteem is a significant and very strong predictor of exam anxiety. The negative evaluation and perception of one's own skills and abilities, as well as the feeling of inadequacy, are considered important psychological factors contributing to exam anxiety.

Although there are studies in the literature that examine the relationship between parental attitudes and exam anxiety, these studies generally rely on scales filled out by parents and parental self-reports. The effect of how children perceive their parents, assessed through a projective method, on exam anxiety has not been explored. Most studies in the literature report that exam anxiety is higher in families with an authoritarian parenting style, while children raised in democratic families tend to experience lower levels of exam anxiety (16, 17). Beyond parenting style, the literature categorizes parent-child communication into two main types: open communication and problematic communication (18). Open parent-child communication allows for comfortable information exchange and emotional expression, promoting shared perceptions and mutual understanding (19). Studies

emphasize that the clarity of parent-child communication should help overcome problems and, in turn, alleviate exam anxiety and psychological stress. In our study, a significant negative correlation was observed between positive maternal attitudes and exam anxiety, whereas negative maternal attitudes were positively associated with higher levels of exam anxiety. These findings highlight the critical role of maternal emotional support in shaping children's stress responses, particularly in high-pressure academic contexts. As the primary attachment figure, the mother often serves as the child's initial emotional mirror, influencing their self-perception and emotional regulation. A negative relationship with the mother can undermine the child's self-esteem and foster feelings of inadequacy, which in turn may exacerbate exam-related anxiety. This aligns with previous research emphasizing the impact of authoritarian or emotionally distant parenting on internalizing symptoms in children (20,21).

Interestingly, our findings did not reveal a similarly direct association between paternal attitudes and exam anxiety. The group with exam anxiety demonstrated a lower number of neutral responses and a higher rate of non-responses regarding their father. This may reflect emotional distancing, avoidance, or a lack of perceived emotional salience in the father-child relationship, potentially indicating that paternal influence is underreported or not fully internalized by children and adolescents in this context. Prior studies have also noted the mother's comparatively stronger emotional presence in the daily lives of children as a possible explanation for this discrepancy.

Moreover, the exam anxiety group showed a tendency toward more negative and fewer neutral interpretations concerning family life. This further suggests that children's subjective perceptions of their family environment especially emotionally charged or conflictual dynamics play a pivotal role in the development of exam anxiety. These findings are consistent with literature reporting that family cohesion, emotional warmth, and parental responsiveness are protective factors against academic stress. Children with exam anxiety exhibited a different distribution of negative attitudes towards their friends. This may be the result of a combination of psychological and social factors. Anxious individuals often have lower self esteem, which is linked to having more automatic negative thoughts. Children experiencing exam anxiety may project their internal unrest onto the outside world, leading to negative interactions with those around them. Additionally, anxiety issues can create difficulties in social skills, which can result in a lack of trust in friendships or misunderstandings in communication. Anxious children often perceive social situations as more threatening, which can lead them to adopt a more defensive and negative attitude.

When comparing the total and subscale scores of the BCT test for children and adolescents seeking help for exam anxiety, girls with exam anxiety were found to have significantly lower positive attitudes towards their self-image and abilities compared to boys (2.2 vs. 1.5; t=2.184, p=0.033). All other variables were found to be similar between the genders (for all, p>0.050; not shown in the table). The literature indicates that gender differences in exam anxiety tend to be higher in girls (22-24). A recent review of the literature also found that girls have higher exam anxiety compared to boys (16). The lower self-image and positive attitudes towards their abilities in girls are considered an important mediating factor in the higher prevalence of exam anxiety in females. This finding should be taken into account by clinicians, as it may have implications for treatment formulation and psychotherapeutic interventions. Future studies should focus on identifying the psychological factors that may mediate the higher incidence of exam anxiety in girls.

CONCLUSION

This study highlights that test anxiety is a complex issue influenced by factors such as self-perception, parental attitudes, cognitive biases, and social relationships. Maternal attitudes, in particular, have a significant impact on test anxiety, while paternal attitudes show no direct effect. The findings emphasize the importance of the parent child relationship, especially the role of maternal attitudes, in shaping test anxiety. Positive maternal attitudes can help reduce anxiety, while negative ones can increase it. To address test anxiety, interventions should focus on improving cognitive biases, boosting self-esteem, and fostering positive parental attitudes. Given the prevalence of exam anxiety in Türkiye, where exams are frequent and performance-based education is common, understanding the individual and environmental factors contributing to test anxiety is crucial for effective treatment and prevention. Further longitudinal studies are needed to clarify the cause-and-effect relationships and explore gender differences in test anxiety.

Limitations

In our study, significant relationships were found between exam anxiety and maternal attitudes; however, no direct relationship was identified with paternal attitudes. It should be noted that the generalisability of these findings may be affected by several limitations. The following essay will explore the issue of subjectivity in the interpretation of projective tests. Projective tests, of which the Beier Sentence Completion Test is an example, are reliant upon the subjective interpretation of responses by the examiner. This subjectivity can influence the consistency and reliability of the results. To minimize this bias, a second researcher independently scored the responses in a blinded manner, and the results were subsequently reviewed with the principal investigator. The single-centre sampling technique constitutes a secondary limitation. Our study was conducted at a single institution, which may limit the external validity of the findings. Single-center studies are more prone to overestimating treatment effects and may not accurately reflect

broader populations. The single-centre sampling technique constitutes a secondary limitation. The study employed retrospective data collection methods, which are susceptible to recall bias. Participants' recollections of past experiences may be inaccurate or incomplete, potentially leading to misclassification and affecting the study's internal validity.

Ethics committee approval

This study was conducted in accordance with the Helsinki Declaration Principles. This study has been approved by the Ethics Committee of Ankara Education and Research Hospital (E-24-251/26.09.2024).

Contribution of the authors

Çolak Sivri A: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***Bayram Ö:*** Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar

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Conflict of interest

The authors declare that there is no conflict of interest.

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