e-ISSN:2687-2145

BANDIRMA ONYEDİ EYLÜL ÜNİVERSİTESİ SAĞLIK BİLİMLERİ VE ARAŞTIRMALARI DERGİSİ
BANU Journal of Health Science and Research

DOI: 10.46413/boneyusbad.1200323 ***Özgün Araştırma / Original Research***

The Effect of the Managing Examination Anxiety Program Applied to High School Students on Test Anxiety

Lise Öğrencilerine Uygulanan Sınav Kaygısını Yönetme Programının Sınav Kaygısı Üzerindeki Etkisi

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Geliş tarihi / Date of receipt: *07.11.2022*

Kabul tarihi / Date of acceptance: *04.12.2022*

Atıf / Citation: Ciydem, E., Savkli, Y. (2022). The effect of the managing examination anxiety program applied to high school students on test anxiety. *BANÜ Sağlık Bilimleri ve Araştırmaları Dergisi, 4*(3), 225-232. *doi: 10.46413/boneyusbad.1200323*

ABSTRACT

Aim*: To examine the effect of the multimodal managing examination anxiety program applied to high school students on test anxiety of high school students and some predictors of test anxiety.*
Material and Methods: *The population of the study, which was in the pretest-posttest single-group quasi-experimental design, consisted of 150 high school senior students. A managing examination anxiety program applied once a week for 7 weeks to 40 students selected using the convinient sampling. The ınformation form and the Westside test exam scale used as data collection tools.*
Results: *The posttest mean score (32.15 ± 8.15) of the students from the Westside Test Exam Scale was significantly lower than the pretest mean score (37.57 ± 5.49) ($p<0.01$). It was found that male students experienced less test anxiety compared to female students ($p<0.01$), and students with high socioeconomic status compared to students with medium socioeconomic status ($p<0.01$).*
Conclusion*: The cognitive behavioral approach can be generalized to larger group settings in schools and can be effective in managing students' test anxiety, especially if combined with other strategies such as relaxation. Gender and socioeconomic status are predictors of test anxiety.*

Keywords: *Test anxiety, High school students, Cognitive behavioral, Relaxation*

ÖZET

Amaç*: Bu çalışmanın amacı lise öğrencilerine uygulanan karma yaklaşıma dayalı sınav kaygısını yönetme programının lise öğrencilerinin sınav kaygısı üzerindeki etkisinin ve sınav kaygısını etkileyen bazı faktörlerin incelenmesidir.*
Gereç ve Yöntem: *Ön test son test tek gruplu yarı deneysel desendeki bu araştırmanın evrenini özel bir lisede öğrenim gören 150 lise son sınıf öğrencisi oluşturdu. Amaçlı örnekleme yöntemi kullanılarak seçilen 40 öğrenciye 7 hafta boyunca haftada 1 kez sınav kaygısını yönetme programı uygulandı. Veriler Tanıtıcı Bilgi Formu ve Westside Sınav Kaygısı Ölçeği ile toplandı.*
Bulgular: *Öğrencilerin Westside sınav kaygısı ölçeğinden aldıkları son test puan ortalamalarının (32.15 ± 8.15), öntest puan ortalamalarına (37.57 ± 5.49) göre anlamlı olarak daha düşük olduğu saptanmıştır ($p<0.01$). Erkek öğrencilerin kız öğrencilere ($p<0,01$), yüksek sosyoekonomik düzeye sahip öğrencilerin ise orta sosyoekonomik düzeye sahip öğrencilere ($p<0,01$). Kıyasla sınav kaygısını daha az yaşadıkları bulundu.*
Sonuç*: Çalışmanın sonuçları, bilişsel davranışçı yaklaşımın okullarda daha büyük grup ortamlarına genelleştirilebileceğine ve özellikle gevşeme gibi diğer stratejilerle birleştirilirse öğrencilerin sınav kaygısıyla baş etmede etkili olabileceğine dair bazı kanıtlar sunmaktadır. Cinsiyet ve sosyoekonomik durum sınav kaygısının prediktörleridir.*

Anahtar Kelimeler: *Sınav kaygısı, Lise öğrencisi, Bilişsel davranışçı, Gevşeme*

INTRODUCTION

During adolescence, individuals enter into a biopsychosocial and mental development. Successful fulfillment of the developmental tasks specific to this period facilitates the transition of the person to the young adulthood period (Meeus, 2022). Educational success has a substantial impact on the educational future of children, due to the High School Transition System in Turkey. One of the biggest concerns experienced by students and parents is educational failure (Giannopoulou et al., 2022). Test anxiety plays an essential role in determining academic achievement. In schools, students are expected to be successful in exams. The effect of exam scores on educational achievement may trigger uneasiness, tension and anxiety in some students (Theobald, Breitwieser, & Brod, 2022). Test anxiety is conceptualized as a personality trait specific to the situation in which the individual experiences anxiety before, after and during a situation that evaluates his/her performance (Zeidner, 1998). Test anxiety consists of two dimensions such as worry and emotionality. "Worry is the cognitive dimension of test anxiety". "Emotionality is the emotional dimension of test anxiety" (Spielberger, 1980). Worry describes persistent thinking about the consequences of not meeting one's performance goals. Because of these persistent thoughts, the person cannot focus attention on the task they want to accomplish. Emotionality refers to the perception of emotional and physiological arousal in a performance appraisal situation (Spielberger, 1980). It is known that test anxiety negatively affects students' success and academic performance (D'Agostino, Schirripa Spagnolo, & Salvati, 2022). However, it is claimed that a certain amount of anxiety is necessary for the person's functionality and performance. (Zeidner, 1998). It has been determined that an increase in test anxiety decreases self-esteem (Thomas, Joseph, & Paul, 2022), and worsens mental and physical health (Damer & Melendres, 2011; Deeap, 2022).

Test anxiety is a complex and multidimensional structure that includes a series of phenomenological, physiological and behavioral responses. Individuals who experience test anxiety during any exam may show signs of anxiety at various levels (Zeidner, 1998). Until now, some intervention programs have been developed and tested to cope with, such as "STEPS" and "Cognitive Bias Modification" (Putwain & Daly, 2014; Sportel, de Hullu, de Jong, & Nauta, 2013). Alternative approaches have examined the impact of practices such as eye movement (Bauman & Melnyk, 1994) and emotional freedom technique (EFT) (Jones, Thornton & Andrews, 2010). Due to the multidimensional and complex nature of test anxiety, it is recommended to apply programs that address all dimensions of the concept of test anxiety in managing test anxiety (Ergene, 2003). Managing examination anxiety program is a fully structured and tested program on secondary school students in coping with test anxiety (Gregor, 2005). It is stated that the program can also be used to reduce the test anxiety experienced by high school students. The program has a holistic structure that combines cognitive, behavioral approaches and relaxation approaches that have been proven effective. It can be applied to students experiencing test anxiety at a subclinical level (Gregor, 2005). Cognitive behavioral approaches deal with unhelpful thought processes and beliefs. So it focuses on cognitions in changing emotions and behavior. Cognitive behavioral approaches are low-cost, short-term and highly effective interventions that empower individuals and increase well-being (Salkovskis, 1996). In addition, it has been determined that relaxation exercises reduce individuals' subjectively perceived anxiety and tension levels. Recent studies report that relaxation approaches are also effective in reducing test anxiety (Manansingh, Tatum, & Morote, 2019). However, no study has been run acrossed that examines the effects of intervention programs that combine cognitive behavioral approach and relaxation techniques on high school students' test anxiety. Studies on test anxiety emphasize that a multimodal approach should be adopted to overcome both test anxiety and skill deficiencies (Gregor, 2005). A tool box can be much more effective in developing self-management skills rather than a single skill. Hence, it was aimed to examine the effect of the mixed approach-based test anxiety management program applied to high school students on test anxiety. In addition, some factors affecting test anxiety in high school students were examined. The outputs of the research can guide educators, educational institutions and experts working in the field of educational psychology in the process of managing high school students' test anxiety. It can also help determine education-related policies at the national level.

MATERIAL AND METHODS

Research Type

This research is a pretest-posttest single-group quasi-experimental study.

Hypotheses

H1: The test anxiety management program has an effect on test anxiety.

Dependent and Independent Variables

The dependent variable is test anxiety. Managing examination anxiety program is the independent variable.

Study Population and Sample

The population consisted of 150 high school senior students studying at XXX High School. The minimum sample size that could represent the population of the study was calculated with the PASS 11. In order to determine the minimum sample size, the number of students determined for 1-□:0.99 ve □:0.05 was calculated as 40 as a result of the Power analysis performed by taking the mean and variance values of a previous similar study (Gregor, 2005) as reference. Convenience sampling method was used in the research. Students who were in the last year of high school at the school where the study was conducted, did not have a physical or mental illness, gave consent from their parents, and agreed to participate in the study were included in the study. Students with chronic pain, chronic physical or mental illness, whose parents did not give written consent, who did not volunteer to participate in the study, and who did not complete all modules of the program were excluded from the study.

Place and Time

The program was implemented at XXX High School between September 15 - October 30, 2022. Data were collected during this date range.

Managing Examination Anxiety Program

The program consists of 7 sessions, once a week. In the first session, there are practices that focus on teaching the effects of anxiety and stress, the changeable aspects of stress, and coping with stress. In the second session, practices focusing on students' awareness of the effects of their negative beliefs on their emotional and behavioral problems, the characteristics of negative automatic thoughts and working on them, and positive interaction with the self are carried out. In the third session, an overview of relaxation methods, the effects of relaxation techniques on heart and respiratory rate, progressive relaxation exercises, relaxation techniques with the help of visual stimuli while lying down and sitting are practiced. In the fourth session, there is a discussion among students about interpersonal relations. It is emphasized in group discussion that people cannot be changed in interpersonal relationships, but our reactions to our interactions with them can be changed. Students are encouraged to talk about sharing anxious thoughts and sources of social support. Feedback is sought from the whole group on how to become a true friend. The practice of relaxation exercises is continued at the end of this session. The fifth session focuses on time management skills and learning styles. It consists of practices related to determining the dominant learning style, time management and planning during the exam preparation process. In the sixth session, there are applications for crisis management, mind freezes, and coping with the worst situations. In the seventh session, mind mapping is applied, which aims to develop problem-solving skills beyond the exam (Gregor, 2005).

Data Collection Tools

Information Form: In the form prepared by the researchers in line with the literature, there are 11 questions containing sociodemographic characteristics (age, gender, physical illness, mental disorder, mother's and father's survival and working status, occupation, and economic status) (Putwain ve von der Embse, 2021; Yeo, Gon, Arief, & Liem, 2016; Gregor, 2005).

The Westside Test Exam Scale: The scale was developed in its original form to be used in examining the effect of a program to reduce test anxiety. While Driscoll (2007) shaped the scale as ten items in a single dimension, Totan and Yavuz (2009) translated the scale into Turkish as eleven items, considering that defining an item as two different sign variables would be more appropriate for Turkish grammar. The factor loads varied between 0.32 and 0.78 and had a single factor structure. Cronbach's alpha coefficient was found to be 0.89 in original study, and 0.81 in current study. The scale is answered in a 5-point Likert type as "Always true: 5 points, Usually true: 4 points, Occasionally true: 3 points, Rarely true: 2 points, Never true: 1 point". The lowest and the highest scores change 33, and 55. All questions are

reversed and a total score is obtained. High scores indicate a high level of test anxiety, and low scores indicate a low level of test anxiety. Although there is no cut-off point, when applied to large groups, students with +1 standard deviation and above can have high test anxiety, and students with -1 standard deviation and below can have low test anxiety (Totan & Yavuz, 2009).

Research Process

The data of the study were collected face to face after the approval of the ethics committee and the permission of the institution. High school senior students and their parents were interviewed. Verbal and written consent was obtained from both the children and their parents. The test anxiety management program was administered by a clinical psychologist, who is one of the experts and researchers in the field. Before and at the end of the program, the children filled the scales. The test anxiety management program was applied to the designated students for 7 weeks in a classroom determined by the school. Each session lasted 45 minutes.

Ethical Consideration

The research was conducted in accordance with the principles of the Declaration of Helsinki. Institutional permission was obtained from XXX Anatolian High School (Issue/date: 99987280-405/38/03.03.2022). XXX University Health Sciences Non-Interventional Ethics Committee approval was obtained from the Ethics Committee (Number/date: 2022-118/13.09.2022). Before the data were collected, the children and their parents were informed about the purpose and scope of the study. Verbal consent was obtained by questioning whether they agreed to participate in the study. Written informed consent was obtained from parents and children who agreed to participate in the study.

Data Analysis

The data of the study were evaluated using the SPSS (23.0) program. Number, percentage, mean and standard deviation were used in data analysis. Dependent groups t-test was used for pretest and posttest comparison. Multiple linear regression analysis was used to analyze the predictors of test anxiety. The conformity of the data to the normal distribution was evaluated according to the Shapiro-Wilk test, the Kolmogorov-Smirnov test, and the skewness and kurtosis values. VIF and Durbin-Watson tests were used to examine multicollinearity. Mahalanobis distance, Cook's distance, and centered leverage value were used to analyze the extreme values. The level of significance was $p<0.05$.

RESULTS

Table 1. Sociodemographic Characteristics of Students (N=40)

Variables	Count (n)	Percentage (%)
Age (mean ± sd:17.25 ± 0.43. min-max: 17-18**)**		
Gender		
Female	26	65.0
Male	14	35.0
Physical illness		
No	36	90
Yes	4	10
Mental disorder		
No	38	95
Yes	2	5
Mother's survival status		
Yes	40	100
Father's survival status		
Yes	40	100
Mother's working status		
No	21	52.5
Yes	19	47.5
Occupation		
Employee	8	20
Officer	4	10
Retired	1	2.5
Self-employment	6	15
Housewife	21	52.5
Father's working status		
No	37	92.5
Yes	3	7.5
Occupation		
Employee	10	25
Officer	5	12.5
Retired	3	7.5
Self-employment	22	55
Economic status		
Moderate	24	60
High	16	40

The mean age of the students was 17.25 ± 0.43. Almost all of the students, 65% of whom are women, do not have a physical or mental illness. It has been found that all of their parents are alive. The mothers of 47.5% of the students and the fathers of 92.5% of the students are working. While mothers work as workers (20%), fathers are mostly self-employed. It was determined that the economic level of 60% of the students was medium (Table 1).

Table 2. Comparison of Students' Westside Test Anxiety scale Pre-test and Post-test Mean Scores

Variable	Pre-test X ± SD	Post-test X ± SD	t	p
Test anxiety	37.57 ± 5.49	32.15 ± 8.15	3.264	p<0.01

Pretest and posttest comparisons examining the effect of the test anxiety management program on students' test anxiety are shown in Table 2. Accordingly, it was determined that the post-test mean scores (32.15 ± 8.15) of the students from the Westside Test Anxiety Scale were significantly lower than the pretest mean scores (37.57 ± 5.49) (p<0.01).

The results of the regression analysis shown in Table 3. Accordingly, the effects of gender and economic level on test anxiety were found to be statistically significant. It was determined that the variables included in the model explained 22.5% of the students' test anxiety (p<0.05). The test anxiety level of male students was 6,004 units lower than that of female students (p<0.01). Students with high socioeconomic status had a lower level of test anxiety by 3,540 units compared to students with moderate socioeconomic status (p<0.05). (Table 3).

DISCUSSION

This study was carried out to examine the effect of test anxiety management program, which combines cognitive behavioral approach and relaxation techniques, on test anxiety of high school students. In addition, some factors affecting test anxiety in high school students were also discussed within the scope of the study. The results of the current study showed that the test anxiety management program was effective in reducing the test anxiety of high school students. Similar to the results of the study, a study was conducted to examine the effectiveness of the program developed by Gregor (2005) and used in this study in reducing the test anxiety of middle school senior students for mathematics lessons. The results of this study also revealed that the test anxiety management program is effective in reducing the test anxiety of secondary school students (Gregor, 2005). Sportel et al. (2013) found that a different test anxiety management program based on cognitive behavioral approach was effective in reducing students' test anxiety in secondary school students aged 13-15 in the Netherlands. In a study conducted by Yeo et al. (2016) with 115 children aged 9-12 in Singapore, group-based cognitive behavioral approach was found to be moderately effective in reducing test anxiety. It has also been shown that a five-session behavioral intervention including exposure and relaxation training, performed with 325 children aged 8-15 in the USA, provided a significant reduction in test anxiety (Weems et al., 2015). Putwain and von der Embse (2021) examined the effectiveness of a six-session cognitive-behavioral intervention for test anxiety in a sample of 14-16 year-old secondary school students preparing for exams in England. In this study, the program was found to be effective in reducing test anxiety, school-related anxiety, and clinical anxiety.

Table 3. Predictors of Highschool Students' Test Anxiety (N=40)

Variables	Nonstandardized coefficient		Standardized coefficient	t	p	95% CI	
	B	SE	Beta			Lower level	Upper level
(Constant)	30.344	31.585		0.961	0.343	30.344	31.585
Age	0.684	1.820	0.055	0.376	0.709	0.684	1.820
Male	-6.004	1.750	-0.528	-3.430	0.002	-6.004	1.750
Mother's working status[b]	-1.921	1.554	-0.176	-1.236	0.225	-1.921	1.554
High socieconomic status[a]	-3.540	1.739	-0.320	-2.036	0.049	-3.540	1.739

Note: F=3.833, p<0.05, Adj. R^2=0.225. a: reference category moderate, b: reference category no.

It is reported that metacognitive and managerial processes such as quitting or continuing to study due to test anxiety are sensitive to emotions. In other words, the negative cognitive evaluation of the emotion experienced in test anxiety may prevent students from studying for the exam. This may lead to the development of repetitive and negative emotional beliefs and panic reactions in students (McCleod & Adams, 1979). As a result, all these situations cause a decrease in the student's exam performance. Changing erroneous thoughts about exams can help students develop a calmer and more positive attitude towards exams. It can also reduce the effect of extraneous thoughts. Combining relaxation techniques and attempts to change erroneous thinking may have further enhanced the effectiveness of the program.

The test anxiety level of male students was 6,004 units lower than that of female students. Similar to the results of the study, Núñez-Peña, Suárez-Pellicioni, and Bono (2016) conducted a study to examine the relationship between gender and test anxiety in university students, and it was revealed that girls experience more test anxiety than boys. In addition, there are different studies showing that girls experience more test anxiety than boys (Huntley, Young, Tudur Smith, Jha, & Fisher, 2022; Dowker & Sheridan, 2022). Gender differences in test anxiety may have two separate explanations. First, this difference can be explained by the social roles imposed on men and women. Accordingly, the fact that women are under more pressure than men to be academically successful may cause them to experience test anxiety more. Second, men may be more defensive about acknowledging anxiety than women. Men may experience admitting that they have anxiety as a threat to their masculinity (Núñez-Peña et al., 2016).

Students with high socioeconomic status had a lower level of test anxiety by 3,540 units compared to students with medium socioeconomic status. In a study conducted in Türkiye similar to the results of the study, it was determined that there is a negative relationship between the level of test anxiety and socioeconomic levels of students learning English. Accordingly, it has been determined that the increase in the economic level is related to the decrease in the level of test anxiety (Önem, 2014). In addition, in a study conducted by Chen (2012) in China, it was revealed that the increase in the economic level of the family is associated with the decrease in the level of test anxiety of high school students. Contrary to these results, in a study conducted by Monga (2020) in India, it was revealed that the increase in socioeconomic level is associated with the increase in the level of test anxiety of high school students. In addition to cognitive and social development, school success and productivity in life can be negatively affected by low income and limited resources (Berger, Paxson, & Waldfogel, 2009). The fact that students with high socioeconomic status experience less test anxiety may be due to the fact that they have more resources and healthy development opportunities. In addition, students who perceive their socioeconomic level as moderate may have more future anxiety. Finding a job today can be long and challenging. In this period, families with high socioeconomic status can support their children economically for a longer period of time. On the other hand, families with lower socioeconomic status may have more limited support for their children. In addition, these students may see education as the way to reach better socioeconomic conditions. Therefore, they may feel that they have to study harder for exams. Anxiety about the future may cause students in this situation to experience test anxiety more intensely.

CONCLUSION

The results of this study showed that a managing examinatin anxiety program that combines cognitive behavioral approach and relaxation techniques based on children's self-report is effective in reducing test anxiety of high school students. In addition, the results of the present study revealed that male students experienced less test anxiety compared to female students, and students with high socioeconomic status experienced less test anxiety compared to students with moderate socioeconomic status.

The results of the study provide some evidence that the cognitive behavioral approach can be generalized to larger group settings in schools and can be effective in dealing with students' test anxiety, especially if combined with other strategies such as relaxation. When students are equipped with various strategies, they are more successful in managing test anxiety. In order for students to cope with test anxiety, it is recommended to integrate and implement a test anxiety management program into the curriculum of schools. It is recommended that students who may be in the risk group in terms of gender and

socioeconomic level should be screened for test anxiety. One of the most important limitations of this study is the absence of a control group. In addition, another important limitation is that the study was in a quasi-experimental design and students were not randomly assigned to the experimental group. Researchers are advised to carry out full randomized controlled experimental studies in the future. In addition, studies can be carried out to compare the effectiveness of the program against different applications. Since the study was conducted in a private high school, it does not provide information about the effectiveness of the program for students in public high schools. Measurement tools are based on self-report and only applied to students. Future research can examine the effectiveness of the program with data from a variety of sources, such as teachers, parents, and exam success criteria. Since the study has a cross-sectional design, longitudinal studies may be performed in the future.

Acknowledgement

We thank the children and their families who participated in the study.

Ethics Committe Approval

Institutional permission was obtained from Private Mersin Universal Culture Anatolian High School (Issue/date: 99987280-405/38/03.03.2022). Ethics committee approval was received for this study from the Bandırma Onyedi Eylül University Health Sciences Non-Interventional Ethics Committee (Date: 13.09.2022 and No: 2022-118).

Author Contributions:

Idea/Concept: E.Ç., Y.Ş.; Design: E.Ç., Y.Ş.; Supervision/Consultancy: E.Ç., Y.Ş.; Analysis and/or Interpretation: E.Ç., Y.Ş.; Literature Review: E.Ç., Y.Ş.; Writing the Article: E.Ç., Y.Ş.; Critical Review: E.Ç., Y.Ş.

Peer-review

Externally peer-reviewed.

Conflict of Interest

The authors have no conflict of interest to declare.

Financial Disclosure

No financial support was received for this study.

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