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Effectiveness of group music therapy in reducing exam anxiety in high school senior students

Burak Sağırkaya [1], Şükrü Torun [2]

Abstract

The aim of this study is to compare the effect of group music therapy practices on test anxiety and the effectiveness of the music lesson taught in accordance with the united annual lesson plan in high school seniors who are preparing for the university entrance exam. Two months before the exam, 49 students studying in the last year of Osmangazi Anatolian High School in Afyonkarahisar province in the 2022-2023 academic years participated in the research. Students were randomly assigned to "Music Therapy" and "Music Lesson" groups. The music therapy group was included in the group music therapy process for 8 weeks, while the music lesson group took only the elective music course in the curriculum. "Westside Exam Anxiety Scale" was used as a data collection tool in the study, and comparisons between groups were made with independent sample t-test, chi-square analysis and factorial mixed design analysis of variance methods. In addition, semi-structured interviews were conducted with the students and the effect of the music therapy sessions was evaluated with the opinions of the participants. In conclusion; it has been observed that students can control their test anxiety through music therapy practices and strengthen their internal audit-based motivation by developing a foresight through affirmation. Moreover; it was stated by the students in the therapy group that peer interaction, music culture and music-based expression skills improved, and that music therapy sessions had a positive effect on them. It was determined that the students in the Music Lesson group experienced a certain increase in their anxiety levels with the approaching of the exam date, and it was difficult for the students to make sense of the music lesson outputs for the curriculum. In this study, it was determined that goal-oriented music therapy practices performed in the school environment were effective in reducing test anxiety. It is thought that the results of the study will contribute to the national and international literature.

Keywords

Music therapy
Group music therapy
Test anxiety
Westside Test Anxiety Scale

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[1] Şırnak University, Faculty of Fine Arts, Department of Music, Şırnak, Türkiye, burak.sagirkaya@gmail.com
[2] Anadolu University, Graduate School, Department of Music Therapy, Eskişehir, Türkiye, torunarts@hotmail.com

Introduction

Although studies on the effects of anxiety on human beings and coping methods have originated in an anonymous time, they have not lost their relevance and have become even more important today. Young generations shaped by age can be thought to experience anxiety processes much more dimensionally than their peers in the past. It would not be wrong to claim that the most common anxiety for young people who continue their academic vocational education is exam anxiety. In particular, how high school students preparing for the university entrance exam can help themselves in the process of coping with their exam-related anxiety has been widely examined in the literature as a general question. However, the extent of the desired effects of group music therapy for high school students on test anxiety has not been studied in the literature previously. Therefore, the question "What is the effect of group music therapy in the process of coping with anxiety in high school students preparing for the university entrance exam?" is considered important in the context of the relationship between exam, anxiety, and music. Certainly, when this process is analyzed in the context of anxiety, test anxiety, music therapy, and group music therapy, the general framework of the subject will gain clarity with a broader perspective.

Anxiety can be considered a general mood process that occurs due to the physical and emotional effects of the images that individuals create in their minds about the process in the face of uncertain situations (Pattee, 2020). In other words, anxiety is the emotional response of a person's body to stimuli (Özer, 2002). Experiencing anxiety is natural. While in some cases, the anxiety process is limited to a short period of time, in others, it can be much longer. Nevertheless, the experience of fear is a natural process. Individuals are often able to regulate or extinguish this feeling with their internal dynamics. In some cases, individuals may not be able to cope with their anxiety. These are more persistent anxiety states. It would not be wrong to say that modern man has experienced an increase in the level and variety of anxiety, as well as the technological and logistical conveniences offered to him by the new age. Especially the concern processes that young people will go through in their professional lives can trigger anxiety and depression when they persist for a long time and can cause undesirable consequences. One of these triggering anxiety states is test anxiety.

Test anxiety is a mental process in which a person doubts their knowledge and abilities and experiences a thought process as if they will fail (Bozanoğlu, 2005; Wu, 2002). It can be considered a physiological mood process that negatively affects students' social behavior, cognitive abilities, and psychological mechanisms in educational processes (Sawka-Miller, 2011; Uğur, 2005; Whitaker Sena et al., 2007). While test anxiety causes distraction in individuals, there is also a risk of low academic performance (Akbulut & Taşçı, 2019; Maviş & Saygın, 2004; Totan & Yavuz, 2009). Studies conducted on high school students show that test anxiety starts to increase, especially in the days before the exam time (DordiNejad et al., 2011; Şahin et al., 2006; Yıldırım & Ergene, 2003).

With the increasing population in developing countries, the examination process, one of the oldest elimination methods of mankind, has become more systematic and frequent. Test anxiety can manifest as tension, fear, and nervousness with the effect of emotional components and common symptoms such as sweating, crying, and heart palpitations with the effect of somatic components (Kavakcı et al., 2011). At certain levels, test anxiety has a positive effect on academic performance. However, severe test anxiety negatively affects performance and creates additional anxiety that is difficult for many people to manage (Musch & Broder, 1999). In such cases, individuals need complementary elements to support them and experts to organize them. In the literature, the positive effects of music and music components on anxiety have been mentioned (Hammer, 1996; Jiang et al., 2016; Lilley et al., 2014; Liu & Li, 2023; Scheufele, 2000). At this point, music and music-based practices can be considered one of the complementary elements for coping with anxiety that students may feel during exam processes. Although studies have demonstrated that playing an instrument or making music as part of a professional or academic duty does not reduce anxiety (Piji Küçük, 2010), the positive effect of music interactions other than professional parameters on mood, stress, anxiety, and concern has been scientifically evidenced (Thompson & Andrews, 2000).

Music can be thought of as conveying one's imagination and emotions through sound patterns that form a rhythmic and melodic structure. Although the effects of music are seen as a means of emotion, expression, and interaction on a common plane, each individual's perception scheme of music is different. Many studies reveal that musical elements such as melody, rhythm, and movement have positive somatic reflections on anxiety processes (Lilley et al., 2014; Smith, 2005). In this context, it is stated that music holistically affects the brain networks that manage the emotional state of individuals, including the limbic system, and reduces the level of anxiety and related somatic effects (Torun, 2022). On the other hand, the concept of music therapy can be referred to when structured scientific support is needed in the process of fighting against anxiety with music-mediated methods.

Music therapy is a therapeutic process in which music-mediated methods are clinically and evidence-based applied in a therapeutic relationship by a music therapist within discipline-specific models, principles, and rules to meet and support the health needs of the individual (DeNora, 2000; Torun, 2020). This process can be viewed as meeting the physical, psychological, social, and spiritual needs of individuals on a therapeutic axis in which music is a crucial tool.

There are many studies in the literature that address a common and multidimensional phenomenon such as anxiety from the perspective of music and music therapy (De L'etoile, 2000; Hammer, 1996; Juslin & Laukka, 2004; Scheufele, 2000; Wilson & Smith, 2000; Wu, 2002). Music therapy research, which is the source of evidence for the positive effects of music-based interventions on anxiety, shows that music has a positive and stimulating effect on the nervous system, helps individuals regulate their mood, and can be used as an effective adjunct to relaxation and stress management (Ellis & Thayer, 2010; Torun, 2020). What needs to be investigated here is who and how the music-based therapy applications affect (Bull, 2000). Test anxiety differs in each student according to age, grade, and course. Considering student groups continuing their education, it can be said that the most intense test anxiety is experienced by senior high school students preparing for the university exam. At the same time, senior high school students are open to peer interactionandshare a common culture with their peers with whom they interact. It is known that especially high school youth listen to music with peer self-engagement, and, in some cases, this music deepens the emotional processes in a negative way. It can be said that this situation affects students' focusing processesandincreases their anxiety levels. It is necessary for healthy and holistic development for students to recognize and experience constructive approaches to the difficulties they experience in every period. Especially when preparing for important exams, it is crucial to support their internal dynamics to identify possible anxiety states, to know their source, to recognize self-motivational devices, and to cope with them. Guidance studies to increase students' intrinsic motivation for test anxiety and to keep their anxiety levels under control are of great importance (Piji Küçük, 2010, p. 46). If it is known how anxiety-inducing emotions arise, it will also be easier to develop insight into anxiety. Because the main factor that causes anxiety is actually how the event is interpreted (Koruklu Öner et al., 2006).

It is a common fact that young people who cannot develop internal foresight for the process they are going through orwho do not receive expert help, experience emotional, social, and physical problems during the preparation process for the university exam (Bozanoğlu, 2005; Doğan, 2020; Güler & Çakır, 2013; Kavakcı et al., 2011; Koruklu Öner et al., 2006; Özer, 2002; Şahin et al., 2006). Therefore, practices to be carried out with peer groups accompanied by an expert can both contribute to their healthy socialization processes and strengthen their empathy processes by allowing them to share with their peers who experience the same anxiety processes as them (Skewes, 2002). At this point, group music therapy practices developed for the stress and anxiety experienced by senior high school students in preparation for university exams can be seen as an effective and complementary element.

Group music therapy can be viewed as a process in which therapists work with the group to identify the group's needs and create a musical universe for groups that have come together for a specific purpose (Ansdell, 2003). Because group music therapy is the experience of meaningful communication and purposeful interaction between people from different cultural backgrounds and with different physical and mental difficulties through music (Proctor, 2002, p. 101). In group music

therapy processes, participants are expected to be as open as possible with each other and to develop a verbal protocol with the therapist prior to the session. In this protocol, a verbal agreement is made that what happens in the group will not be taken out of the process by the group members and that the competencies of each individual will be accepted and not judged within the group (Torun, 2022). Ansdell (2003) in his study mentioned group music therapy processes and group differences, emphasizing that each group has its own dynamics and that the models to be applied are specific to that group.

For example, it is not possible to talk about a common musical taste when using a group of volunteers of different ages and socio-cultural backgrounds who do not know (or know of) each other but have come together for a common purpose. Therefore, group music therapy differs from individual music therapy in many ways. For example, in group music therapy, not all musical ideas may be accepted by other group members; at this point, musical actions should be determined by the therapist's competencies and the dynamics of the group. In other words, in group music therapy processes, as opposed to individual music therapy, the performance in the group and the dynamics of the groups being worked with affect the process and all individuals. Verbal and musical rhythmic sharing during the sessions increases the interaction within the group, helps them realize the existence of common concerns, and helps them develop their sense of empathy (Koruklu Öner et al., 2006).

Group music therapy practice with high school students focusing on the university entrance exam should be conducted in a setting where students can feel comfortable expressing themselves in the group, and the students' competencies should be taken into consideration. It is believed that group music therapy practices will help high school students, especially those with test anxiety, to develop new internal insights about their feelings and to focus on their goals.

In the literature reviewed from the above perspective, the intensity of studies on test anxiety in high school students is striking in terms of quantity. However, there are almost no studies that deal with a therapeutic application process, especially the evidence-based music therapy process. To the best of our knowledge, there is no study in the literature on the effects of group music therapy practice on test anxiety in high school students who are about to take the university entrance exam. In this context, it was observed that there is a need for research on the effects of evidence-based group music therapy practices on test anxiety. In a process such as the university entrance exam, which affects millions of young people and families each year, it is considered of great importance to present examples of music-based interventions to reduce test anxiety in young people and to include them in the music therapy literature. Sharing the results of the study is also considered necessary in order to reveal the contextual and formal contours of evidence-based music therapy practice. For this reason, it is believed that this study will contribute to the literature by shedding light on future research by providing the first data on the effects of music therapy on college entrance exam anxiety. In addition, the study was planned to be compared and analyzed with the effects of music education according to the unified annual plan published by the Turkish Ministry of National Education. In this way, it will be examined to what extent the music lessons in the final curriculum of high school seniors are effective in supporting the relaxation and motivation process, which is accepted as one of the goals.

1. Research Hypotheses: In this study, it was thought that Group Music Therapy practices may be effective in reducing test anxiety levels in senior high school students and that the music lesson based on theunited annual curriculum does not reduce test anxiety. In this direction, the following hypotheses were tested:

- ***Hypothesis 1:*** (H0) There is no significant difference between the pre-test test anxiety scores of the Music Therapy (MT) and Music Lesson (ML) groups.

(H1) There is a significant difference between the pre-test test anxiety scores of MT and ML groups.

- ***Hypothesis 2:*** (H0) There is no significant difference between the pre-test and post-test test anxiety scores of the MT group.

(H1) There is a significant difference between the pre-test and post-test test anxiety scores of the MT group.

- ***Hypothesis 3:*** (H0) There is no significant difference between the pre-test and post-test test anxiety scores of the ML group.

(H1) There is a significant difference between the pre-test and post-test test anxiety scores of the ML group.

- ***Hypothesis 4:*** (H0) There is no significant difference between the pre-test and post-test test anxiety scores of the MT and ML groups.

(H1) There is a significant difference between the pre-test and post-test test anxiety scores of the MT and ML groups.

In line with the research hypothesis, answers were sought to the following questions.

- What are the Test Anxiety Levels of the Groups before the Practice?
- What are the Test Anxiety Levels of the Groups after the Practice?
- What are the Results of the Comparison of the Change in Test Anxiety Levels of the Groups Before and After the Practice?

2. Aim: The aim of this study was to examine the effect of group music therapy practices on test anxiety in high school students preparing for the Higher Education Institutions Examination (YKS) by comparing the effect of music lessons taught according to the unified annual curriculum.In line with this purpose, we aimed to introduce the results obtained from the high school seniors, who participated in group music therapy practices in the school environment, regarding test anxiety to the literature.

3. Importance: It is known that senior high school students experience a certain increase in their anxiety levels due to the approaching exam date and that they have difficulties in self-managing their anxiety levels. It is thought that this study is important for introducing the effects of goal-oriented and evidence-based music therapy practices in the school environment on reducing test anxiety to the literature. In line with this importance, comparing the changes in the test anxiety levels of the participating groups is thought to contribute significantly to the literature.

4. Assumptions: It was assumed that the group of senior high school students participating in the study was appropriate to examine the problem, that the participants represented all field students, that the data obtained from the Westside Test Anxiety Scale reflected the reality, that the scoring obtained from the Westside Test Anxiety Scale reflected the correct results, and that the sample group with whom the study was conducted reflected the population.

5. Limitations: This research is limited to the scoring obtained from 49 voluntary students, who would take the university entrance exam in 2023, in the school (Anatolian high school) where the researcher works and in the province, using the Westside Test Anxiety Scale with the facilities of the school where the study was conducted.

Method

Research Model

This experimental study was designed to compare the effects of music therapy and curriculum-based music lessons on test anxiety in senior high school students. A pre-test/post-test comparison design was used to explore the effectiveness of the two interventions. Curriculum-based music lessons, unlike music therapy practices, do not involve goal-specific structured interventions. For this reason, in comparisons regarding the effectiveness of structured active music therapy practices, it was thought sufficient to include only the ML group who received the curriculum-based lesson, and a control group was not included in the study.

Study Group

This study includes senior high school students preparing for the YKS exam. The study was started to be conducted 80 days before the YKS exam in the 2022-2023 academic year at Afyonkarahisar Merkez Osmangazi Anatolian High School. Out of a total of 221 students studying in 7 different classes, 52 students voluntarily participated in the study. To avoid selection bias, these students were randomized into two groups using an open access computer-based program. In this program, students numbered from 1 to 52 were randomly assigned to one of the two groups (https://www.graphpad.com/quickcalcs/randomize1/). Consequently, 26 students were randomly assigned to the music therapy (MT) group and 26 were assigned to the music lesson (ML) group. The MT group included only the students who were to receive music therapy, and the ML group included only the students who were to receive curriculum-based music lessons. Three students in the music lesson group withdrew from the study due to their excuses. Accordingly, the study was completed with a total of 49 participants, 26 students in the MT group and 23 in the ML group.

General characteristics of the population: In our country, the final year of high school is considered as the last step of the 12-year compulsory education. It is not possible to enroll in any institution of higher education without graduating from the final year of high school. In order to enroll in higher education, it is necessary to get a certain score from Higher Education Institutions Examination (YKS). According to the data of the Council of Higher Education, 3,527,443 people applied to YKS in 2023, whereas the number of people enrolled in any of the 208 universities in Turkey in 2024 was 591,257. The constantly developed and renewed exam system requires students, especially those studying in general education institutions such as Anatolian high schools, to undergo an intensive study tempo. Therefore, it is known that the anxiety levels of students studying in Anatolian high schools who want to enroll in a department that provides at least 4-year education increase especially as the exam approaches. It can be suggested that studies to be conducted in order for students to overcome this process at the most possible level are still up to date.

Data Collection Tools

Westside Test Anxiety Scale: The Westside Test Anxiety Scale was used as a data collection tool in the study. The scale was first developed by Driscoll (2007) and adapted to Turkish by Totan and Yavuz (2009) and its validity and reliability were established (2009). Totan (2018) introduced the scale to the literature by conducting its validity and reliability for secondary school students (middle and high school). While Drisccoll's scale consists of ten items, Totan and Yuvuz's adaptation consists of eleven items. The Westside Test Anxiety Scale is the only scale that has been adapted into Turkish for secondary education and is the only scale whose validity and reliability have been established and which has been available for high school students' test anxiety. The scale is accepted as the most widely accepted secondary school test anxiety scale in the database of the General Directorate of Measurement and Evaluation of the Ministry of National Education and is among the most widely used test anxiety scales in our country. Totan found the Cronbach's alpha validity of the scale to be 0.92 for middle school and 0.91 for high school. The scale, in which holistic cohesion disorder and anxiety are accepted as a single factor, is scored on a 5-point Likert scale. The reliability of the scale was found to be significantly correlated ($p<.001$) at the level of 0.74 in high school with a two-week interval. Accordingly, the scale is scored as (5) Always True, (4) Mostly True, (3) Occasionally True, (2) Rarely True, and (1) Never True. The lowest score that can be obtained from the scale, which does not include reverse-coded items, is 11, and the highest score is 55. Low-level test anxiety ranges from 11.0 to 25.0 points, moderate test anxiety ranges from 26.0 to 40.0 points, and high-level test anxiety ranges from 41.0 to 55.0 points (Driscoll, 2007, cited in Totan, 2018).

Forms: Between March and June 2023, when the research was conducted, all the participants were within the age of 18, the participants were considered to be of legal age since they were 19 years old, and the ***voluntary participation consent form*** was obtained from the participants themselves. ***The participant information form*** is not a measurement or assessment tool and was collected only from the students in the music therapy group. Four questions were asked to the students. They were asked to write down the types of music they listen to, the singers they follow, the songs they like to sing, and their thoughts about music. The information obtained was used only for the improvement of music therapy sessions for the participants and the sessions are detailed in the group music therapy implementation section. ***Participant evaluation form:*** After the eight-week music therapy intervention, an evaluation form was given to the music therapy group and the music lesson group, and they were asked to write down their thoughts about what they gained or lost in the process. The information obtained aimed to evaluate the results of the research.

Research Process

The practices continued for 8 weeks and 2 hours per week. One hour of the counseling course was spent with only the MT group and the other hour was spent with only the ML group in separate classrooms.

The study was conducted within the framework of ethical rules by obtaining the necessary permissions (Afyonkarahisar Provincial Governorship and Anadolu University Health Sciences Scientific Research and Publication Ethics Board, Türkiye). Since the study was conducted openly in the school environment, it was not possible to use single- or double-blind methods. The age factor was not included in the study as a sociometric data because the ages of the participants were close to each other in days and months. All participants were born in 2004-2005.

Prior to implementation, the goal was to reach an agreement between the participants and the practitioner and establish group rules. In this context, after reaching a verbal agreement with the music therapy group on transferring the principles of music therapy practices, providing information about the process, and determining the general framework of the process and group rules, the 8-week implementation process began.

The sessions included active music therapy practices developed within the framework of the Neurocreative Music Therapy approach (Torun, 2020). Neurocreative Music Therapy was developed by Prof. Şükrü Torun based on music-brain interactions and functional neuroplasticity processes in brain network organization and is a holistic music therapy approach that determines the health/educational needs and therapy goals of individuals or groups from a phenomenological perspective, uses correlational and behavioral active music therapy methods and techniques with a creative and eclectic approach in line with therapy goals, and focuses on improving the individual's quality of life (Torun, 2020).

The weekly implementation plan and session content are detailed in Table 1 and Table 2. The group music therapy practices structured in this context were carried out by focusing on the management of test anxiety in adolescents. The methods included in the group music therapy implementation process can be listed as composing songs, writing new lyrics to known songs, improvisation exercises, rhythm exercises, movement exercises, active music listening activities based on interaction and sharing, and musical conversations.

Competencies of the practitioner: The practitioner received music therapy practitioner training approved by the Ministry of Health and obtained a certificate approved by the Traditional, Complementary and Functional Medicine Practices Department of the Ministry of Health after the training. The practitioner is also the first person in our country to be accepted to and graduated from the Master's Program of the Department of Music Therapy, which was established in 2021 with the approval of the Council of Higher Education under the leadership of Prof. Dr. Şükrü Torun at the Institute of Health Sciences at Anadolu University. In addition, the practitioner attended several courses organized by the Nordoff-Robbins Music Therapy Center and worked with Polish music therapist, Agnieszka Rynkiewich, for two semesters within the scope of the EU-supported UA project.

Group Music Therapy Implementation Process

Music is an elective lesson in high school. The curriculum is not inclusive for senior high school students. It is known that students have negative thoughts about this lesson, about which no questions are asked in the university entrance exam. In light of this information, the researchers tried to examine the question "How can senior high school students preparing for the exam process benefit from music outcomes based on their goals?". Based on this question, the main outlines of the study were developed in line with the question "Can the goal-oriented implementation of music-based outputs in the school environment reduce anxiety levels?". To this end, the researchers developed an eight-week program and implemented it to the music therapy group.

Table 1. Music Therapy Weekly Practice Plan

Session	Practice Contents
Week I	Presentation and Introductions (Consensus Process)
Week II	Process of practicing self-expression
Week III	Music-based biography and self-identification through music
Week IV	Verbal and rhythmic improvisation practice process for test anxiety
Week V	Anxiety-focused music-based imagery practice process
Week VI	Compositional practice process for test anxiety
Week VII	Improvisation-based confidence work and dampening process
Week VIII	Evaluation and closure process

Table 2.1. Music Therapy Group Detailed Session Plan

Session	Session Contents	Session Goals
Week I	It includes group music therapy practices for test anxiety.	Recognition of the group music therapy process, self-definition, emotional awareness, and sharing.
Week II	It includes group music therapy practices for test anxiety.	Increasing process-oriented immediate motivation and self-management skills.
Week III	It includes sessions on music, relationships, and music-based group interaction.	It was determined as obtaining therapeutic gains within the framework of music-based awareness and developing the competencies of evaluating and predicting the anxiety process with group work.
Week IV	It includes exercises on the traces that music and songs leave in our memories.	In developing predictions for test stress, it was determined as discovering the positive and negative effects of music and contributing to the process of developing insights to cope with test anxiety.
Week V	It includes group music therapy exercises on writing new lyrics to known songs (Lyricising).	Contributing to the process of developing insights to cope with test-related anxiety by writing lyrics and singing songs.
Week VI	It is an interactive MT application, from pictures to music. It includes practices on the realization of a therapeutic process through drawing a picture.	Recognizing the effect of the combination of painting and music on the way of predicting test anxiety and experiencing the competence of colors and music in test anxiety management.
Week VII	It includes music-based practices on self-esteem expression studies.	Music-based free improvisation studies on how to improve the mood-state relationship based on self-confidence for test anxiety.
Week VIII	It includes practices on damping and ending the process and transferring the gains to real life.	It was identified as a sharing for process evaluation and making connections to real life.

Music Lesson Process According to United Annual Plan

Music is an elective lesson in high school. The content to be taught at each grade level in this lesson is based on the United Annual Curriculum published by the Board of Education of the Ministry of National Education. The learning outcomes of the lesson are mainly focused on topics such as music theory, makam knowledge, and music culture. If the program is fully coved, it is obvious that it will make a great contribution to raising generations with deep musical culture and knowledge. However, as mentioned before, these lessons do not aim to reduce exam anxiety.

Table 2.2. Detailed Lesson Plan for the Music Lesson Group

Lesson	Lesson Content	Lesson Acquirements
Week I	General features of Turkish music from the 20th century to the present day were covered.	Students recognize the general characteristics of Turkish music. They recognize the composers of Turkish music.
Week II	A repertoire was created by listening to Turkish music.	Students develop an appreciation for the pieces of Turkish music. They listen to the works of Turkish music.
Week III	Musical pieces of Turkish music were performed.	Students recognize the works of Turkish music. They sing in Rast maqam and Hicazmakam.
WeekIV	Students were enabled to associate folk music instruments from different parts of the world with Turkish music instruments.	Students distinguish the instruments. They recognize Turkish folk music instruments, traditional Balkan instruments, and traditional Middle Eastern instruments.
WeekV	Students listened to examples of leading orchestra-choir conductors and their performances.	Students listen to choral pieces, orchestral pieces. They distinguish orchestral works. They recognize Hikmet Şimşek, Gürer Aykal, and Rengim Gökmen.
Week VI	Western music interpreters in our country were covered.	Students recognize the interpreters of polyphonic Turkish music. They recognize Leyla Gencer, İdil Biret, Suna Kan, Şirin Pancaroğlu, and Şefika Kutluer.
Week VII	Students practiced distinguishing according to the genres of the music played.	Students distinguish the pieces of Turkish music. They distinguish the pieces of Turkish folk music, polyphonic music, and the pieces of pop music.
Week VIII	The subject of conducting music-related research and studies using information technologies was covered.	Students search for musicians by using information technologies. They investigate the life stories of musicians by using information technologies.

Analysis of the Data

The study revealed the effects of group music therapy practices on test anxiety in senior high school students preparing for the YKS. As a result of the literature review, it has been seen that the Westside Test Anxiety Scale is a valid scale for measuring test anxiety, identifying change, and comparing data, and therefore it was used in the study. In this context, the pretest and posttest data collected using the WestsideTest Anxiety Scale from two different groups who participated in group music therapy sessions and music lessons based on the curriculum for 8 weeks were analyzed using the IBM SPSS 25 program. In the analysis, primarily, the personal information of theMT and the ML groups were presented using descriptive analysis methods, and the differences between the groups were examinedusing independent samples t-test and chi-squared analysis methods. Then, theKolmogorov-Smirnov normality test was performed to check whether the participant scores on the Westside Test Anxiety Scale showed normal distribution. This test measures the variation of the sample distribution from a normal distribution. As a result, the lower the D value, the higher the probability of a normal distribution of the data. The p-value quantifies this probability; a low probability indicates that the data

deviate from a normal distribution. Low D and high p (>0.05) values indicate that the data are normally distributed. In addition, the closer the skewness and kurtosis values are to zero, the higher the probability that the distribution is normal (Table 3).

Table 3. Normality Test Results (Summary of Kolmogorov-Smirnov Distribution)

Statistical Value	
Number (n)	49
Mean	36.87755
Median	36
StandardDeviation	5.692219
Skewness	-0.086037
Kurtosis	1.131959
Result	
K-S Test Statistics (D)	**0.15373**
p Value	**0.17773**

The results of the normality test show that the distribution is normal. In addition, the comparisons between the MT and ML groups were examined using the independent samples t-test, chi-square analysis, and factorial mixed design analysis of variance methods. Finally, the relationships between participants' personal information and test anxiety scores were examined using independent sample t-test and Pearson correlation analysis methods. The significance level was set at 0.05 in the analyses.

Results

Results of the Groups on Test Anxiety Levels Before Implementation and Interpretations

The pre-test and post-test findings regarding the students' test anxiety before and after the implementation are given below.

Table 4. Findings Regarding the Westside Test Anxiety Scale

Test anxiety	**Group**	**N**	**Mean**	**SD**	**t**	**p**
Pre-test	MT group	26	39.04	4.51	3.062	.004
	MD group	23	34.43	5.98		
	Total	49	36.88	5.69		
Post-test	MT group	26	32.92	5.44	-1.638	.108
	MD group	23	35.70	6.41		
	Total	49	34.22	6.01		

Table 4 shows the pre-test and post-test scores of the participants on the Westside Test Anxiety Scale. A high scale score indicates a high test anxiety level. According to the findings obtained from the pre-test, the mean test anxiety score of the participants in the MT group was 39.04±4.51. In the ML group, the mean pre-test test anxiety score was 34.43±5.98. According to the independent samples t-test, when the pre-implementation (pre-test) scores of the groups were compared, it was determined that the test anxiety score of the MT group was significantly higher than that of the ML group (t = 3.062, p = .004).

According to the post-test findings, the mean test anxiety score of the participants in the MT group was 32.92±5.44. In the ML group, the mean post-test test anxiety score was 35.70±6.41. According to the independent samples t-test, when the post-test scores of the groups were compared, no significant difference was found between the test anxiety scores of the MT and ML groups (t = -1.638, p = .108).

Findings and Interpretation Regarding the Test Anxiety Levels of the Groups After Implementation

Below are the results of the effects of music lessons and group music therapy practices, conducted according to the unified annual curriculum, on the test anxiety of senior high school students.

Table 5. Comparison of Percentage Frequencies of Participants' Test Anxiety Levels After the Procedure

Test Anxiety Levels	Pre-test				Post-test			
	MT group		MLgroup		MT group		ML group	
	f	%	f	%	f	%	f	%
Low	0	0	2	8.7	5	19.2	1	4.3
Moderate	16	61.5	16	69.6	20	76.9	16	69.6
High	10	38.5	5	21.7	1	3.8	6	26.1
	$X^2 = 3.496$. p = .174				$X^2 = 6.523$. p = .038			

According to the findings in Table 5, 61.5% of the MT group had moderate test anxiety and 38.5% had high test anxiety in the test anxiety pre-test. In the pre-test, 8.7% of the ML group had low test anxiety, 69.6% had moderate test anxiety, and 21.7% had high test anxiety. According to the chi-square test, no significant difference was determined between the pre-test test anxiety levels of the MT and ML groups ($X^2 = 3.496$, p = .174).

According to the post-test findings, 19.2% of the MT group had low test anxiety, 76.9% had moderate test anxiety, and 3.8% had high test anxiety. In the post-test, 4.3% of the ML group had low test anxiety, 69.6% had moderate test anxiety, and 26.1% had high test anxiety. According to the chi-square test, there was a significant difference between the test anxiety levels of the MT and ML groups in the post-test, ($X^2 = 6.523$, p = .038). Accordingly, it was determined that the participants in the observation group had a significantly higher test anxiety level than the participants in the experimental group.

The results of the comparisonanalysis, which was conducted to confirm that the groups differed significantly by reducing the error rate, are also presented below (Tablo 6).

Related to the Comparison of the Change in Test Anxiety Levels of the Groups Before and After the Procedure

Table 6. Comparison of Pre-Test and Post-Test Scores of Groups According to Factorial Mixed Design Analysis of Variance Method and Post-Hoc Test

Test anxiety	MT group		ML group			
	Mean.	SD	Mean.	SD	F	p
Pre-test	39.04	4.51	34.43	5.98	93.695	.001
Post-test	32.92	5.44	35.70	6.41		

Table 6 compares the pretest and posttest scores of participants in the MT and ML groups on the Westside Test Anxiety Scale. A factorial mixed design analysis of variance was used to make the comparison. In this analysis, the MT group and the ML group represent the 2-group independent variable, while the pretest and posttest mean represent repeated measures. According to the results obtained as a result of the analysis of variance, it was seen that the pretest and posttest scores in the study differed significantly according to the MT and ML groups, $F(1, 47) = 93.695$, $p < .001$.

The Bonferroni post hoc test was used to interpret the significant difference. When the graph in Figure 1 is analyzed according to the results of the post-hoc test, it is seen that the test anxiety post-test score of the MT participants in the experimental group decreased significantly compared to the pre-test ($p < .001$), while the test anxiety post-test score in the ML group increased significantly compared to the pre-test (p = .028) (Figure 1).

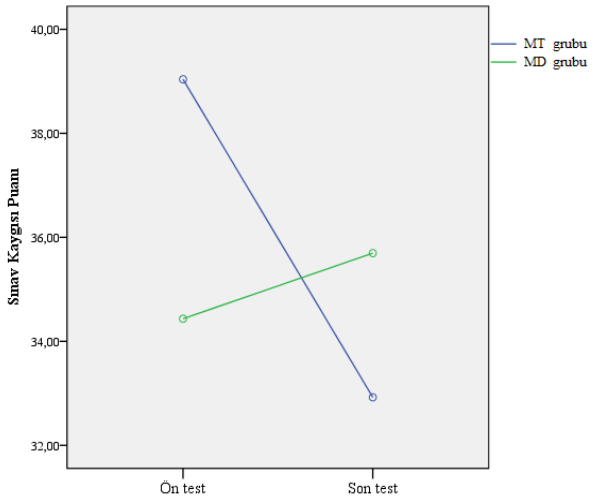

Figure 1. Comparison of Groups According to Pre-Test and Post-Test Scores

Discussion and Conclusion

In the study, the mean anxiety score of the MT group, which was 39.04±4.51 at the beginning, significantly decreased to 32.92±5.44. In the ML group, the mean anxiety score, which was 34.43±5.98 before the implementation, increased to 35.70±6.4 after music lessons. Due to this reverse change in anxiety scores, it is natural that there was no significant difference between the anxiety levels of the two groups at the end of the intervention. While there was a slight increase -rather than a decrease- in the anxiety level in the ML group who received music lessons according to the annual plan, a significant decrease was observed in the group who received music therapy. It is thought that this finding shows the effectiveness of group music therapy implemented on high school seniors in reducing test anxiety.

The increase in anxiety in the ML group can be explained by the increase in negative emotions related to the exam in parallel with the passage of time and the fact that the music lessons had no preventive effect on this increase. On the other hand, the anxiety-reducing effect of the group music therapy sessions structured within the framework of the neurocreative music therapy approach, in accordance with the goal of reducing test anxiety through the use of music and music components, is clearly seen. This positive change can only be explained by the effect of group music therapy, given the similarities in the other characteristics of the groups.

In the evaluation interviews conducted after the eight-week music therapy intervention, the students in the MT group stated that they had a very constructive process toward the YKS exam, that their self-motivation for the exam was strengthened, that being able to express themselves through music strengthened their sense of achievement, that their musical culture developed through peer interaction during the group music therapy sessions, and that they realized that they had the same concerns as their peers, which contributed to their sense of empathy. On the other hand, the students who took music classes only according to the unified annual plan stated that the outcomes of this course were difficult for the senior class and that the academic outcomes of the music course, which is a cultural course, were challenging for the students who were preparing for the exam, that the student's expectations of the course did not match the outcomes, and that the learning outcomes of the course were not fully achieved for the students, that the student's expectations for the course did not match the outcomes and that the learning outcomes of the course were not fully achieved for the students, and that in general, the students could not concentrate during class because they wanted to study for the exam, so they were in the act of constantly experiencing anxiety and excitement.This information is consistent with the Westside Test Anxiety Scale scores.

In the literature, there are mostly studies that measure the anxiety related to the examination processes of student groups studying at the university level. In the studies of authors such as Bodas et al. (2008), Güler and Çakır (2013), Kavakcı et al. (2011), Piji Küçük (2010), it is seen that different inventories such as State Anxiety Inventory, Test Anxiety Inventory, Depression Inventory, Self-Esteem Inventory are used and these studies include relational data to determine students' test anxiety levels and psychological effects of anxiety. The results of the studies indicate that test anxiety triggers depression and that variables such as family and gender affect anxiety. It can be said that these studies differ from our study in many aspects in terms of purpose, design, scales used, methods, study group characteristics, and of course, results. In this context, while addressing the studies that appear to be related to the subject in the literature, it is seen that the literature gap regarding the possible role of music-based approaches in reducing test anxiety is at a remarkable level. In our study, a process focused on self-awareness and self-regulation within the framework of music interactions on how to cope with test anxiety was carried out and the data obtained through the Westside Test Anxiety Scaleare presented. It is observed that other studies do not address how to provide self-control for anxiety management. Although the utilized scales vary, it is possible to come across studies that measure the level of test anxiety using the Westside. Doğan's (2020) research is a study that should be evaluated in this context. The results of this study, which was conducted on 675 students, indicate that the anxiety level of university students is higher than that of high school students and that anxiety increases with age. In this respect, Doğan's study differs from ourstudy. While this study examined how test anxiety changed between two groups before and after the application, Doğan's studyaimed to identify the group with high test anxiety rate between groups.

Again, it is seen that the Westside Anxiety Scale was used in the studies of Küçük (2010), Taşkın and Çetin (2021), Yücel et al. (2019). However, it can be seen that these studies were not specifically addressed in the context of a purposeful structured application, and the relationship between the pre-test and post-test was not investigated. Küçük (2010), on the other hand, examined the effect of test anxiety experienced by music department students on instrumental performance in performance exams. In this study, it is seen that the measurements were made immediately before the exam, it was not based on practices that would support the students motivationally, and the data were collected more on the axis of the anxiety-performance relationship. Yücel et al. (2019) conducted their research from the perspective of "investigating the exam anxiety status of individuals who receive music education" for students who are studying at Fine Arts High School. In this study, it can be seen that the pre-test and post-test models were not used, the measurements were made at an unspecified time interval, it was not clearly determined on which axis the measurement was based, and the motivation of the students was not supported. As can be seen from these examples, these studies did not focus on the effects of an intervention on test anxiety, but rather on determining the situation of high school students with regard to the exam. However, there are also studies in the literature on motivational support for students preparing for university entrance exams and students who experience test anxiety in other areas using various methods. The study of Koruklu Öner et al. (2006) is in this direction. In the study, which included a group of 60 students divided into experimental and control groups, the "Coping with Test Anxiety Program" was applied to the experimental group for eight weeks, and Automatic Thinking and State Anxiety Inventories were used as pre-test and post-test. As a result, the data showed that the program was beneficial. As can be seen, it is not possible to talk about music-based application processes in these studies. In addition, there is no goal that it provides sustained anxiety management through group practice. In the literature on test anxiety and music therapy, Akbulut and Taşcı (2019) conducted a study that examined the effectiveness of music-based practices for state conservatory students just before their exams. In this study, it is not clear what data was collected about the students before or after the exam, but it is observed that they determined the data through a self-developed questionnaire and that the application was more related to the state anxiety process. Nevertheless, results show that this research reveals a crucial process in developing a student's internal control through music-supported practices. Based on this idea, it was thought that specially designed group music therapy applications in our research would contribute more to the

motivational devices that can be developed for high school students' test anxiety and the prediction of their own anxiety processes. To the best of our knowledge, there is no other study in the Turkish literature that is similar to the structure of our study, which consists of a combination of group music therapy and test anxiety designed according to the principles of music therapy in education.

In reviewing the international literature on test anxiety, Ergene's the meta-analysis study published in 2003 is noteworthy. In this study, which analyzed 56 studies with a large number of participants (2480), results showed that 75% of the participants who were involved in some kind of support process for test anxiety achieved positive results compared to those who did not receive support. In other words, according to the results of the meta-analysis, individualized and goal-oriented intervention processes reduce test anxiety. In addition, Ergene states that based on the results, there is a serious lack of research and practice on test anxiety reduction programs for these student groups, although programs that combine individual and group counseling formats produce significant changes in primary and secondary school students. These results and comments are considered important because they contain a supportive emphasis that overlaps with the purpose, quality, and outcome of our research.

In 2013, Jiang, et al. (2013) worked with 144 undergraduate music students. Their study examined the effect of playing calming music on individuals who were experiencing anxiety. The participants were randomly divided into four different experimental groups. The groups were as follows. Group 1 were those who chose the soothing music themselves, Group 2 were those who chose the highly stimulating music themselves, Group 3 were those who had no right to choose the soothing music (the music they listened to was chosen by the researchers), Group 4 were those who had no right to choose the highly stimulating music (the music they listened to was chosen by the researchers). Before the research, the individuals' tension was measured with the anxiety scale, and the same test was applied again after the research. As a result, it was revealed that there was a decrease in the state anxiety level of the subjects who listened to calming music without the right of choice, but there was no significant difference in the state anxiety level between listening to calming music and listening to stimulating music. These striking results are consistent with the idea that high school students determine the music they listen to through peer and environmental interactions and that anxiety levels increase when they do not make sense of the music they listen to.

Again, according to the results of another study conducted by Jiang et al. (2016) with 200 participants in 2016, it is emphasized that the effect of music in reducing anxiety depends on the music preference and the most important factor in reducing anxiety is determining the degree of enjoyment of the music listened to. In both of the Jiang et al. studies, it was found that liking/enjoyment of the music being listened to affected anxiety levels more than recognition. During the music-based interaction and communication-based sessions of our study, it was observed that students enjoyed the applications and were, therefore, more willing to express themselves through music, and that this process was effective in developing insight into test anxiety and minimizing test anxiety by motivating themselves through music. Results showed that during the structured group music therapy sessions included in our research, participants were exposed to different music and performed music-based practices with it, which allowed for a decrease in anxiety levels.

Galal et al. (2021) conducted an experimental pilot study on the effectiveness of music intervention in reducing test anxiety with approximately 200 undergraduate students. The study is described as an "evaluation of the effectiveness of a brief classroom activity involving music on anxiety". Randomly assigned students were divided into music-playing and music-listening groups. Pre- and post-test assessments of attitude, perception, and anxiety scales were administered to all students. In this respect, the study is parallel to our research. In addition, the results obtained from the music intervention sessions of Galal et al. indicate that the effect of music-playing groups and music-listening groups on students' test anxiety does not create a significant difference. Another unexpected result from this study is that test anxiety was high before the music intervention and decreased after the session. The researchers state that even a short-term music intervention process helps reduce state test

anxiety. Although the results of the study overlap with our study, Galal et al.'s study was conducted with state anxiety scales and included a single and short-term session process. Our study, on the other hand, was not instantaneous, lasted for eight weeks, and focused on measuring process-oriented test anxiety levels in the music therapy group and the curriculum music class group and determining the extent to which intrinsic motivational devices for test anxiety could be strengthened with group music therapy. Therefore, although our results do not fully overlap with the pattern of results obtained by Galal et al., they converge in the conclusion that music-based approaches are effective in reducing test anxiety.

Liu and Li (2023) conducted their research with 240 undergraduate students. The students were randomly assigned to control and experimental groups. The experimental group participated in 24 group music therapy sessions three times a week for a total of 2 months. Each therapy session was divided into five parts: 1-warm-up/initiation, 2-rhythmic percussion and instrumental ensemble, 3-singing, 4-conclusion/closure, and 5-evaluation. While there was no significant difference in the anxiety scores of the control and experimental groups before the research, it was observed that a highly significant difference occurred in the anxiety scores of the experimental and control groups after the intervention. The results of the research suggest that music therapy interventions significantly reduce students' anxiety processes and that goal-oriented music therapy sessions have a positive effect on school/test anxiety processes and improve students' quality of life. The results of Liu and Li's study overlap with the results of our study. However, our study was conducted with a limited group of students, and it is believed that research results with more intensive participation are needed.

There is only one study in international literature that is considered similar to our study. This study was introduced to the literature by Sharafati et al. in 2022. In their study, they aimed to determine the effectiveness of music therapy applications based on pre-test and post-test scores in the process of reducing test anxiety in about 30 secondary school students randomly divided into experimental and control groups. As in our study, a single test anxiety scale was administered to the research groups. In their study, 15 students in the experimental group received 90-minute group music therapy sessions for eight weeks. In our study, eight music therapy sessions of 40 minutes each were organized for 26 students. The results were analyzed using the SPSS program and analysis of variance as in our study. The results of the Sharafati et al. study suggest that goal-oriented group music therapy processes significantly reduce test anxiety scores of secondary school students. In our study, the same result was obtained for high school students. Although the fact that our study did not include a control group with no music interaction seems to be a limitation, it is noteworthy to compare and examine the changes in test anxiety levels of the groups that experienced two different music-based interactions. In our study, while test anxiety scores decreased in the music therapy group, anxiety increased in the curriculum-based music instruction group. It can be seen that Sharafati et al. did not clearly state the setting in which the goal-directed group music therapy sessions were conducted and how the application provided internal control and motivation for test anxiety. While in our study there was a single age scale and a specific exam focus such as the YKS, the distribution in Sharafati et al.'s study addresses all groups of secondary school students between the ages of 12-18 and all school exams. In this respect, it is not clear how the intervention reduces test anxiety holistically and how long this process lasts. While the processing of the research suggests a reduction in state test anxiety, the presentation of the research data points in the direction of a reduction in process-oriented test anxiety. It is considered a shortcoming that the researchers did not discuss their studies with this aspect in mind. In this regard, it is believed that our research addresses the relationship between test anxiety and music therapy in a cause-and-effect relationship and will contribute to the literature in an "eclectic, empirical, and generalized" line.

Recommendations

it is thoughtthat group music therapy strengthened the motivational devices of senior high school students to cope with their test anxiety and contributed to the development of their internal control to affirm test anxiety on the basis of music. It may be recommended that such studies be conducted more comprehensively in Anatolian and Science high schools, religious vocational high schools, and other vocational high schools that accept students based on exam results.

Considering the insufficiency of studies on music therapy in the school environment (in education) in the literature, it is thought that this study will provide a pioneering resource for researchers who want to conduct new studies in this field.

The fact that the participants of the study consisted of a small number of high school students from a particular school is considered a limitation. It is believed that studies conducted with larger samples of students who study in different schools and better represent the sociocultural diversity of society will provide more reliable results.

For future studies, it may be recommended to compare music therapy interventions with other specific interventions structured to reduce test anxiety rather than typical music lessons.

The challenging aspects of the research include the facts that some session contents needed to be developed, that the research was conducted over a long period such as eight weeks, that the practice was carried out with a relatively large group, and that the process was carried out by only one researcher. It is thought that there is a need for overall data from future studies to be conducted by more than one researcher, at different times, in shorter periods, and with fewer participants to contribute to the literature on the subject in a multidimensional way.

References

Akbulut, C., & Taşçı, S. (2019). Final sınavı öncesi müzik terapi uygulaması. In T. Sağer, H. Arapgirlioğlu, K. Perçin Akgül, & K. Sürmeli (Eds.), *Uluslararası SANAD Kongresi bildiri kitabı* (pp. 489-494). Gece Akademi.

Ansdell, G. (2003). Community music therapy: Big British balloon or future international trend?. In *Community, relationship and spirit: continuing the dialogue and debate*. BSMT Publications.

Bodas, J., Ollendick, T. H., & Sovani, A. V. (2008). Test anxiety in Indian children: A cross-cultural perspective. *Anxiety, Stress, & Coping, 21*(4), 387-404. https://doi.org/10.1080/10615800701849902

Bozanoğlu, İ. (2005). Bilişsel davranışçı yaklaşıma dayalı grup rehberliğinin güdülenme, benlik saygısı, başarı ve sınav kaygısı düzeylerine etkisi. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 38*(1), 17-42.

Bull, M. (2000). *Sounding out the city. Personal stereo and the management of everyday life*. Berg.

De L'etoile, S. (2000). The history of the undergraduate curriculum in music therapy. *Journal of Music Therapy*, *37*(1), 51-71. https://doi.org/10.1093/jmt/37.1.51

DeNora, T. (2000). *Music in everyday life*. Cambridge University Press. https://doi.org/10.1017/CBO9780511489433

Doğan, U. (2020). Lise ve üniversite öğrencilerinde sınav kaygısının karşılaştırılması. *Muğla Sıtkı Koçman Üniversitesi Eğitim Fakültesi Dergisi, 7*(1), 35-42. https://doi.org/10.21666/muefd.637421

DordiNejad, F. G., Hakimi, H., Ashouri, M., Dehghani, M., Zeinali, Z., Daghighi, M. S., & Bahrami, N. (2011). On the relationship between test anxiety and academic performance. *Procedia Social and Behavioral Sciences, 15,* 3774-3778. https://doi.org/10.1016/j.sbspro.2011.04.372

Driscoll, R. (2007). *Westside Test Anxiety Scale validation* (Report No. ED495968). https://files.eric.ed.gov/fulltext/ED495968.pdf

Ellis, R. J., & Thayer, J. F. (2010). Music and autonomic nervous system (dys)function. *Music Perception, 27*(4), 317-326. https://doi.org/10.1525/mp.2010.27.4.317

Ergene, T. (2003). Effective interventions on test anxiety reduction: A meta-analysis. *School Psychology International, 24*(3), 313-328. https://doi.org/10.1177/01430343030243004

Galal, S., Vyas, D., Hackett, R. K., Roganü, E., & Nguyen, C. (2021). Effectiveness of music interventions to reduce test anxiety in pharmacy students. *Pharmacy (Basel), 9*(1), 10. https://doi.org/10.3390/pharmacy9010010

Güler, D., & Çakır, G. (2013). Lise son sınıf öğrencilerinin sınav kaygısını yordayan değişkenlerin incelenmesi. *Türk Psikolojik Danışma ve Rehberlik Dergisi, 4*(39), 82-94.

Hammer, S. E. (1996). The effects of guided imagery through music on state and trait anxiety. *Journal of Music Therapy*, *33*(1), 47-70. https://doi.org/10.1093/jmt/33.1.47

Jiang, J., Rickson, D., & Jiang, C. (2016). The mechanism of music for reducing psychological stress: Music preference as a mediator. *The Arts in Psychotherapy, 48*, 62-68. https://doi.org/10.1016/j.aip.2016.02.002

Jiang, J., Zhou. L., Rickson. D., & Jiang. C. (2013). The effects of sedative and stimulative music on stress reduction depend on music preference. *The Arts in Psychotherapy*, *40*(2), 201-205. https://doi.org/10.1016/j.aip.2013.02.002

Juslin, P. N., & Laukka, P. (2004). Expression, perception, and induction of musical emotions: A review and a questionnaire study of everyday listening. *Journal of New Music Research, 33*(3), 217-238. https://doi.org/10.1080/0929821042000317813

Kavakcı, Ö., Güler, A. S., & Çetinkaya, S. (2011). Sınav kaygısı ve ilişkili psikiyatrik belirtiler. *Klinik Psikiyatri Dergisi, 14*(1), 7-16.

Koruklu Öner, N., Öner, H., & Oktaylar, H. C. (2006). "Sınav kaygısı ile başa çıkma programının" sınav kaygısına etkisine yönelik deneysel bir çalışma. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*, (19), 5-11.

Küçük, D. P. (2010*).* Müzik öğretmeni adaylarının sınav kaygısı, benlik saygısı ve çalgı başarıları arasındaki ilişkinin incelenmesi. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, *11*(3), 37-50.

Lilley, J. L., Oberle, C. D., & Jr-Thompson, J. G. (2014). Effects of music and grade consequences on test anxiety and performance. *Psychomusicology: Music, Mind, and Brain, 24*(2), 184-190. https://doi.org/10.1037/pmu0000038

Liu, S., & Li, G. (2023). Analysis of the effect of music therapy interventions on college students with excessive anxiety. *Occupational Therapy International*, *2023*(1), 1-11. https://doi.org/10.1155/2023/3351918

Maviş, A., & Saygın, O. (2004). *Sınavlara hazırlananlar için başarı rehberi.* Hayat Yayıncılık.

Musch, J., & Broder, A. (1999). Test anxiety versus academic skills: A comparison of two alternative models for predicting performance in a statistics exam. *British Journal of Educational Psychology, 69*(1), 105-116. https://doi.org/10.1348/000709999157608

Özer, K. (2002). *Sınav ve sınanma kaygısı*. Pegem Yayıncılık.

Pattee, E. (2020). *The difference between worry, stress and anxiety.* The New York Times. https://www.nytimes.com/2020/02/26/smarter-living/the-difference-between-worry-stress-and-anxiety.html

Piji Küçük, D. (2010). Müzik öğretmeni adaylarının sınav kaygısı, benlik saygısı ve çalgı başarıları arasındaki ilişkinin incelenmesi. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, *11*(3), 37-50.

Proctor, S. (2002). Empowering and enabling. *Voices: A World Forum for Music Therapy, 1*(2). https://doi.org/10.15845/voices.v1i2.58

Sawka-Miller, K. (2011). Test anxiety. In S. Goldstein & J. A. Naglieri (Eds.), *Encyclopedia of child behavior and development* (pp. 1478-1479). Springer. https://doi.org/10.1007/978-0-387-79061-9_2890

Scheufele, P. M. (2000). Effects of progressive relaxation and classical music on measurements of attention, relaxation, and stress responses. *Journal of Behavioral Medicine*, *23*(2), 207-228. https://doi.org/10.1023/A:1005542121935

Sharafati, R., Ismaili, A., Mir Mahmoudi, S., Khorami, R. A., & Basir, H. G. (2022). Study of the effectiveness of music therapy on student's test anxiety. *Ilkogretim Online-Elementary Education Online, 21*(2), 59-69.

Skewes, K. (2002). A review of current practice in group music therapy improvisations. *Brithis Journal of Music Therapy*, *16*(1), 46-55. https://doi.org/10.1177/135945750201600107

Smith, B. P. (2005). Goal orientation, implicit theory of ability, and collegiate instrumental music practice. *Psychology of Music*, *33*(1), 36-57. https://doi.org/10.1177/0305735605048013

Şahin, H., Günay, T., & Batı, H. A. (2006). İzmir ili Bornova ilçesi lise son sınıf öğrencilerinde üniversiteye giriş sınavı kaygısı. *STED/Sürekli Tıp Eğitimi Dergisi*, *15*(6), 107-113.

Taşkın, H., & Çetin, Ö. (2021). The effect of spiritual counseling and care on academic success and exam anxiety: An application on high school students. *Turkish Journal for the Spiritual Counselling and Care*, (4), 9-38.

Thompson, B. M., & Andrews, S. R. (2000). An historical commentary on the physiological effect of music: Tomatis, mozart a neuropsychological. *Integrative Physiological and Behavioral Science, 35*(3), 174-188. https://doi.org/10.1007/BF02688778

Torun, Ş. (2020). Müzik terapide aktif yaklaşımlar ve nörokreatif müzik terapi. In Ş. Torun (Ed.), *Müzik terapi, müzik tıbbı ve müzik temelli diğer uygulamalar* (pp. 20-30). Türkiye Klinikleri Yayınevi.

Torun, Ş. (2022). *Gençlerde sınav kaygısını azaltmak için müzik terapisi atölyesi* [Workshop]. Anadolu Üniversitesi Türk Dünyası Bilim Kültür ve Sanat Merkezi, Eskişehir.

Totan, T. (2018). Ortaokul ve lise öğrencilerinde sınav kaygısının değerlendirilmesi: Westside sınav kaygısı ölçeği. *Batı Anadolu Eğitim Bilimleri Dergisi*, *9*(2), 143-155.

Totan, T., & Yavuz, Y. (2009). Westside sınav kaygısı ölçeğinin Türkçe formunun geçerlik ve güvenirlik çalışması. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 9*(17), 95-109.

Uğur, M. (2005). Stres kavramı ve psikiyatrik hastalıklar. In İ. Balcıoğlu (Ed.), *Medikal Açıdan Stres ve Çareleri Sempozyumu* (pp. 13-33). İstanbul Üniversitesi Tıp Fakültesi.

Whitaker Sena, J. D., Lowe, P. A., & Lee, S. W. (2007). Significant predictors of test anxiety among students with and without learning disabilities. *Journal of Learning Disabilities, 40*(4), 360-376. https://doi.org/10.1177/00222194070400040601

Wilson, B. L., & Smith, D. S. (2000). Music therapy assessment in school settings: A preliminary investigation. *Journal Music Therapy*, *37*(2), 95-117. https://doi.org/10.1093/jmt/37.2.95

Wu, S. M. (2002). Effects of music therapy on anxiety, depression and self-esteem of undergraduates. *J-STAGE Journal of Psychologia, 45*(2), 104-114. https://doi.org/10.2117/psysoc.2002.104

Yıldırım, İ., & Ergene, T. (2003). Lise son sınıf öğrencilerinin akademik başarılarının yordayıcısı olarak sınav kaygısı, boyun eğici davranışlar ve sosyal destek. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 25, 224-234.

Yücel, C., Şen, Ü. S., & Şen, Y. (2019). Güzel sanatlar lisesi müzik bölümü öğrencilerinin sınav kaygı düzeylerinin çeşitli değişkenler açısından incelenmesi. *Uluslararası Sosyal Araştırmalar Dergisi, 12*(66), 773-778. https://doi.org/10.17719/jisr.2019.3626