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Research Article

The Effect of Music Therapy and Progressive Muscle Relaxation Exercise on Anxiety Before the First Clinical Practice in Nursing Students: A Randomized Controlled Study

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Abstract

AIM: This study was carried out to evaluate the effect of music therapy and progressive muscle relaxation exercise on the state and trait anxiety levels before their first clinical practice in nursing students.

METHOD: This randomized controlled experimental study sample consisted of 86 nursing students who will be firstly applied to clinical practice. The students were randomly assigned to music (n=30), exercise (n=28), and control (n=28) groups. The data of the study were collected with Student Information Form and State-Trait Anxiety Scale. The music therapy intervention was applied to the music group three times a week for the first 2 weeks. Progressive muscle relaxation exercise was applied alone to the exercise group three times a week for the first 2 weeks in a separate room. No intervention was applied to the control group. This study RCT number is: NCT04540172

RESULTS: The majority of the students was female (81.4%), and the mean age was 19.74±1.38 years. After the interventions, there was a statistical difference between the groups, and this difference was created by the control group ($p<0.05$). The pre-test and post-test results were compared in the experimental groups, and the state anxiety levels had decreased ($p<0.05$). There was no significant difference in the trait anxiety levels between the groups ($p>0.05$).

CONCLUSION: Music therapy and muscle relaxation exercises can be used to reduce the state anxiety levels in nursing students before their first clinical practice experience.

Keywords: Anxiety, clinical practice, music therapy, progressive muscle relaxation

Introduction

Anxiety is a situation in which various physiological responses occur together with feelings of distress and suffocation in various situations where an individual feels threatened. The type of temporary and stationary anxiety caused by dangerous and unpredictable situations is defined as "state anxiety"; the type of anxiety that is caused by intrinsic reasons gives the individual a feeling that his eigenvalues are threatened, and state anxiety that intensifies and gains continuity is defined as "trait anxiety" (Baysan-Arabacı et al., 2015; Demir et al., 2014; Günay et al., 2008; Jimenez et al., 2010; Öner & Lecompte, 1983; Sevinç & Özdemir, 2017; Torabizadeh et al., 2016). Various methods such as music therapy, progressive muscle relaxation exercises, hypnosis, dreaming, and aromatherapy have been used to cope with anxiety. Whereas music therapy reduces attention, anxiety, and fear by decreasing the hormonal effects that occur with stress and affects the autonomic nervous system by diverting attention in another direction, progressive muscle relaxation exercises reduce tension by causing the individual to feel the difference between tension and laxity in the body, allowing the individuals to relax by themselves (Caldeira-Timmins & Timmins, 2017; Karamızrak, 2014; Sezer, 2011; White, 2001; Yılmaz & Arslan 2015; Zanini et al., 2009).

Clinical practice, which has an important role in nursing education, is among the largest sources of anxiety for students because it contributes to the gaining of professional skills and laying the foundation of future nursing roles (Baysan-Arabacı et al., 2015; Karadağ et al., 2013; Şendir & Acaroğlu, 2008). Moderate anxiety can increase the students' creativity and development; however, high anxiety can

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negatively affect the learning processes by causing carelessness and focusing problems and leads to application errors and situations such as decrease in academic performance (Günay et al., 2008; Yeniçeri et al., 2007). In the literature, it is stated that anxiety that occurs especially in the early stages of clinical practice is higher than that at other periods. Nursing students experience intense anxiety for reasons such as insufficient knowledge and skills at the beginning of clinical practice, harming the patient by doing something wrong, encountering negative reactions, and low self-confidence caused by inexperience (Açıksöz et al., 2016; Baysan-Arabacı et al., 2015; Jones & Johnston 1997; Karaca et al., 2017; Öner-Altıok & Üstün, 2013; Sheu et al., 2002; Şendir & Acaroğlu, 2008). However, the fact that the clinical environment offers real-life experience and the unpredictable emotion of giving care to patients and individuals who are at the end of life may increase the uncertainty and cause the student nurse to experience higher levels of anxiety (Baysan-Arabacı et al., 2015; Karaca et al., 2017; Öner-Altıok & Üstün, 2013; Sharif & Masoumi, 2005). The student who is faced with any factors that may cause anxiety during the clinical practice cannot cope with this situation, and it may negatively affect the student's academic performance and the perception of the profession (Karabacak et al., 2012).

Using effective methods to deal with the anxiety experienced by the students before the first clinical practice is important in increasing their academic success (Karabacak et al., 2012; Karaca et al., 2017).

While the nursing students continue their academic education, the burden of starting clinical practice causes them to experience anxiety. This anxiety is greater in the first clinical practice because they do not know how to deal with the dynamic and complex clinical settings or how to communicate well with the clinical staff and trainers (Baysan-Arabacı et al., 2015). In addition, if the anxiety is severe or persistent, nursing students cannot adapt to the clinical education and may experience emotional issues such as anger, apathy, frustration, and depression that could negatively affect their learning. Therefore, it is important for them to realize their concerns and use effective coping methods to control these issues (Bowie, 2010; Dehkordi et al., 2009). When the literature was examined, studies evaluating the effect of music therapy, muscle relaxation exercises, cognitive therapy, emotional freedom technique, breathing exercises, mind purification, and aromatherapy for reducing the anxiety level in the nursing students were found (Chen et al., 2013; Dehkordi et al., 2009; İnce & Çevik, 2017; Kang et al., 2009; Malinski & Todaro-Franceschi, 2011; McCaffrey et al., 2009; Patterson, 2016; Torabizadeh et al., 2016). However, there was no study in which the effects of music therapy and progressive muscle relaxation exercises in nursing students were applied as methods for dealing with anxiety before clinical practice. Therefore, this study was carried out to evaluate the effect of music therapy and progressive muscle relaxation exercise on the state and trait anxiety levels before their first clinical practice and to compare the two methods.

Research Hypotheses

H1: Music therapy and progressive muscle relaxation exercises are effective in reducing the state anxiety levels.

H2: Music therapy and progressive muscle relaxation exercises are effective in reducing the trait anxiety levels.

Method

Study Design

This study was designed as a randomized controlled experimental study. This study RCT number is: NCT04540172

Sample

This study was carried out in the autumn semester of academic year 2018–2019. The research population consisted of 96 students who would go into clinical practice for the first time at the nursing faculty of a public university in Istanbul. All the students who would go to their first clinical practice without sampling were included in the study (n=96). Inclusion criteria were being 18 years or older, not graduating from Health Vocational High School, being enrolled in the Nursing Fundamentals theoretical course, participating fully in the attempts being applied in the study, being in the field of application determined on the first clinical application day, and volunteering to participate in the study. Accordingly, the study was completed with 86 students who met the inclusion criteria.

Analysis

Licensed SPSS Statistical Package for the Social Sciences Statistics 16.0 (SPSS Inc.; Chicago, IL, USA)

package program,) was used for data analysis. The results were evaluated at a 95% confidence interval and a significance level of $p < 0.05$. Nominal variables as frequency and percentage; ordinal variables were evaluated as mean and standard deviation. As the study data showed normal distribution according to the Shapiro-Wilk test, t-test and ANOVA were used to compare the mean scores of the scale.

Ethical Considerations

Approval was taken from the University's Ethics Committee (approval number: 46418926-050.03.04) before the study commenced. Written permissions were taken from the university where the study was conducted. After informing the students given about the study, the consent forms prepared for each group were read and signed by the students who accepted to participate voluntarily.

Data Collection

The data were collected with the Student Information Form containing the demographic characteristics of the students and the State-Trait Anxiety Inventory.

State-Trait Anxiety Inventory (STAI)

It was developed by Spielberger et al. (1970) and was validated in the Turkish context by Öner and Le Compte (1977). STAI consists of two different sections and contains a total of 40 items, 20 in each section. The State Anxiety Inventory (SAI) reflects the emotions and thoughts that an individual feels at that moment. Trait anxiety inventory (TAI) is generally evaluated by scoring the feelings and thoughts they feel between levels 1 and 4 as follows: "None" (1), "A little" (2), "Very" (3), and "Completely" (4). The items 1, 2, 5, 8, 10, 11, 15, 16, 19, 20, 21, 26, 27, 33, 36, and 39 in the scale are scored with inverting. A higher score indicates that the level of anxiety is high. The alpha reliability coefficient of TAI is 0.94–0.96, and that of SAI is 0.83–0.87 (Öner & Le Compte, 1985). In this study, the reliability coefficient of SAI in each measurement is first 0.90 and then 0.91; that of TAI was found to be first 0.76 and then 0.88.

Music therapy and muscle relaxation exercises were performed by two instructors who are responsible for teaching the Fundamentals of Nursing course; this course is taught by 6 lecturers. For randomization of the study, the program www.random.org was used. The students were assigned to the study groups according to their numbers in the class list.

The students were asked to fill in the Student Information Form and the Spielberger STAI. The clinical practice of the Fundamentals of Nursing course started in the third week of the academic calendar. Thereafter, intervention was applied to the experimental groups three times a week for the first 2 weeks. No additional method was applied in the control group. On the morning of the day they went to their clinical practice, interventions were applied to the experimental groups for the last time. The control group was taken to a separate class, and some time was given to check the documents required in the clinical practice. Thereafter, STAI was applied to all the students. All the groups were provided with the clinical practice areas at the same time (Figure 1).

Application of Music Therapy

"Mahur tune," one of the nonverbal instruments of the Traditional Turkish Music Authorities, was selected for the study with the opinion of a music therapy specialist. The Mahur tune is a calming tune and is relaxing because it usually covers a wide sound spectrum (1–2 octaves). It creates an uplifting and pleasing atmosphere. It immediately draws the attention of the audience and keeps the mind open. The Mahur tune is also from the family of Râst tunes. Râst tunes generally create mystical feelings, peace, surrender, and security in the person (Özbek, 2015).

In this study, music therapy was applied in the practice room. Environmental noise was reduced as much as possible; the room was dimly lit. The students were asked to close their eyes after sitting comfortably in a chair and focus on the music by asking them to imagine a different memory and place that would relax them instead of the thoughts that occupied their minds. The music was played through a portable computer for 15 minutes under the supervision of the researchers using an mp3 player program on the computer.

Application of Progressive Muscle Relaxation Exercise

The relaxation exercise was developed by Edmund Jacobson in the 1920s. It was described in his book *Progressive Relaxation* in 1929. Relaxation techniques are among the methods that increase the comfort and quality of life of an individual (Lorenc & Cooke, 2019). Progressive muscle relaxation exercise involves regular and consecutive squeeze and release of the muscles until there is relaxation throughout the body. The purpose of the exercise is to feel the difference between tension and release in the body, and it teaches one to relax by oneself. It

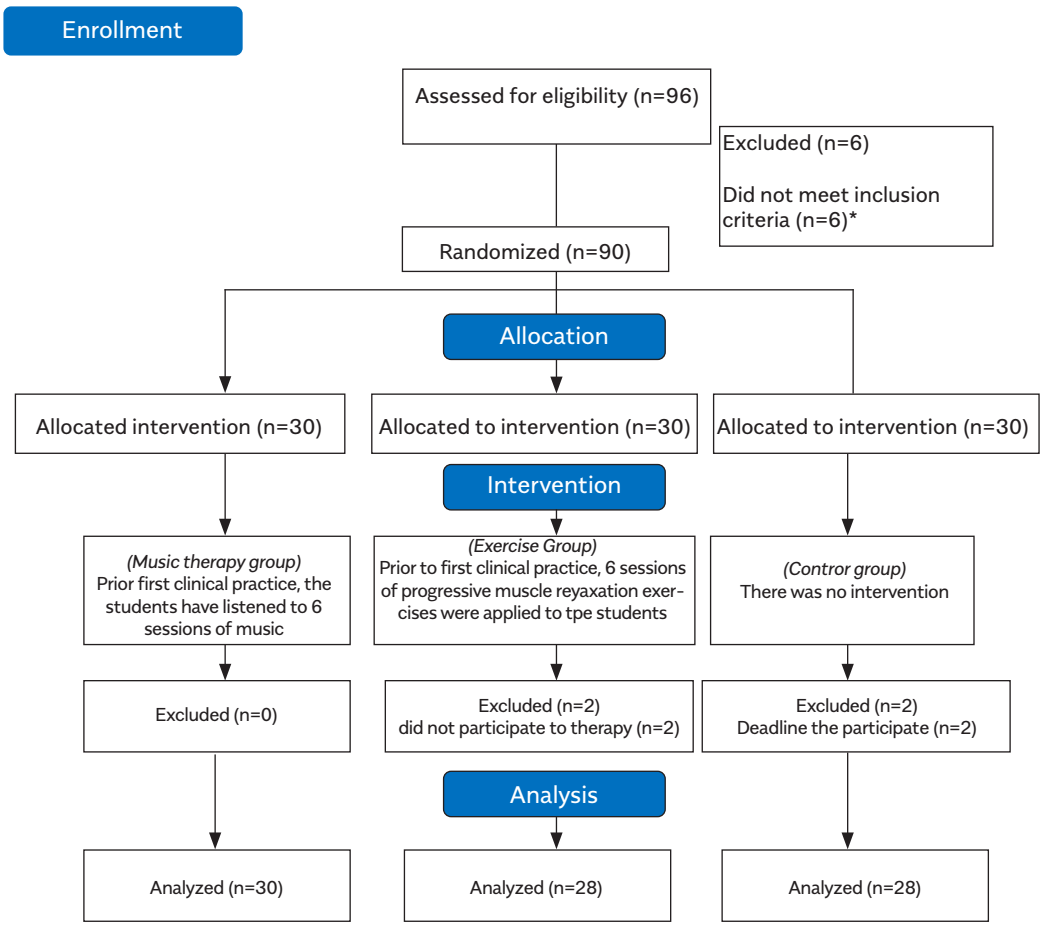

Figure 1
Consolidated Standards of Reporting Trials *(CONSORT) 2010 Flow Diagram for Study Participants (Moher et al., 2010)*

is a technique that starts from the feet to the head or from the head to the feet, pausing in the middle with slow and deep breathing, relaxing each muscle. (Büyükyılmaz & Aşti, 2013; Caldeira-Timmins & Timmins, 2017; Yılmaz & Arslan, 2015).

In this study, the steps of applying progressive muscle relaxation exercise were created with the guidance of the "Relaxation Exercises" materials of the Turkish Psychological Association (Boyacıoğlu & Kabakçı, 2010). Progressive muscle relaxation exercise was applied alone to the exercise group. Progressive muscle relaxation exercise was performed in the practice room, and only the students included in the exercise group were present in the room. Warning messages were hung on the door of the room, environmental noise was reduced as much as possible, and the room was provided with dim lighting. The students were asked to close their eyes and breathe deeply after sitting comfortably in a chair. After taking two deep breaths, they were told to dangle their arms and relax as much as possible. After preparing the environment and the individuals, progressive muscle relaxation exercise was started from head to toe. The hands, shoulders, neck, chest, abdomen, hips, legs, feet, toes, and facial muscles were made to relax while they breathed and relaxed while exhaling. They were asked to store the experience into their memories thoroughly so that they could recall this feeling for comfort during the day. They were then told to sit in a chair, remember the room they were in, count down from 10 when they were ready, and slowly open their eyes. This process took 15 minutes.

Results

Most of the individuals participating in the study were female (81.4%), and the average age of the participants was 19.74±1.38 years. According to the findings obtained from the research, when the STAI

mean scores by sex were compared, no significant difference (p>0.05) was found between the SAI levels of the groups. According to the average trait anxiety level, female was found to have higher levels of trait anxiety (42.22±6.70) than male (36.93±6.32), and this difference was statistically significant (p<0.05) (Table 1).

H1 Music therapy and progressive muscle relaxation exercises are effective in reducing the state anxiety levels.

There was no statistically significant difference (p>0.05) between the groups in the state anxiety levels before the interventions (Table 2). After the application, there was a significant difference (p<0.05) between the groups, and this difference was caused by the control group. In addition, there was a statistically significant difference (p<0.05) in the anxiety levels before and after both the interventions (Table 2). According to these results, H1 was confirmed.

H2 Music therapy and progressive muscle relaxation exercises are effective in reducing the trait anxiety levels.

It was determined that there was no statistically significant difference (p=>0.05, p>0.05) in the level of trait anxiety between the groups before and after the interventions. At the same time, it was found that music therapy and progressive muscle relaxation exercises did not result in a statistically significant difference (p>0.05, p>0.05) in the level of trait anxiety. According to these results, H2 was rejected.

Table 1
Comparison of SAI and TAI Scores by Sex (n=86)

	Female (n=70)	Male (n=16)	Test value	p
Sex	**Mean±SD**	**Mean±SD**		
SAI	39.71±9.07	38.68±7.88	0.417*	0.677
TAI	42.22±6.70	36.93±6.32	2.877*	0.005

Note. SAI: State anxiety inventory, TAI: trait anxiety inventory, *t test.

Discussion

This study was carried out to evaluate the effect of music therapy and progressive muscle relaxation exercises on the state and trait anxiety levels before the first clinical practice in nursing students. According to the study findings, it was observed that both the interventions significantly decrease the state anxiety level. However, the difference between the two

Table 2
Comparison of State Anxiety Inventory Scores before and after Music Therapy and Progressive Muscle Relaxation Exercise by Groups (n=86)

	Music (n=30)	Exercise (n=28)	Control (n=28)		
Groups	**Mean±SD**	**Mean±SD**	**Mean±SD**	**Test value**	**p**
Pre-test	38.53±8.08	41.64±10.23	38.46±7.98	1.201*	0,306
Post-test	32.4±9.51	32.07±8.05	37.96±9.95	3.648*	0,03
Test value	2.673**	3.758**	0.208**		
p	0.012	0.001	0.837		

Note. SD: Sum of squares deviation, ANOVA: analysis of variance, *ANOVA; **t test

Table 3
Comparison of the Trait Anxiety Inventory Scores before and after Music Therapy and Progressive Muscle Relaxation Exercise by Groups (n=86)

	Music (n=30)	Exercise (n=28)	Control (n=28)		
Groups	**Mean±SD**	**Mean±SD**	**Mean±SD**	**Test value**	**p**
Pre-test	41.66±6.83	40.75±5.99	41.28±7.99	0.125*	0,882
Post-test	39.76±6.95	40.64±7.05	41.75±11.52	0.374*	0,689
Test value	0.951**	0.068**	-0.155**		
p	0.349	0.946	0.878		

Note. SS: Sum of squares deviation, ANOVA: Analysis of variance, *ANOVA; **t test

interventions in reducing the state anxiety level is not statistically significant. According to our results, it can be said that H1 is accepted, and that music therapy and progressive muscle relaxation exercises before the first clinical practice are effective in reducing the state anxiety levels in nursing students. H2 is not accepted because the trait anxiety levels of the students in the study do not create a statistically significant difference after the interventions.

When the anxiety levels of the students in the study were examined before the intervention, it was found that the mean scores of SAI were 39.52±8.83, and the mean scores of TAI were 41.24±6.91. In the study where Açıksöz et al. (2016) measured the anxiety levels of nursing students before the clinical practice, they reported the mean scores of SAI as 38.6±7.64, and the mean score of TAI as 47.6±6.27. In a similar study conducted by Baysan-Arabacı et al. (2015), the mean score of nursing students' SAI was 41.05±10.69, and their TAI mean was 48.05±5.00. In the study conducted by Sevinç and Özdemir (2017) aimed at measuring the anxiety levels of nursing students, it was stated that the second-grade nursing students' mean TAI scores were higher than those of the other grades ($p<0.05$). During nursing education, students may experience anxiety and stress, especially in clinical practices (Baysan-Arabacı et al., 2015). The results obtained from the literature and the findings of the study also support that clinical practice affects the state and trait anxiety levels of nursing students.

In this study, there was no significant difference between the state anxiety levels by gender; however, it was found that the mean scores of women were higher than those of men. It is stated that common anxiety disorders and stress are more common in women than in men (Ak & Kılıç, 2017; Bal et al., 2013; Reisner et al., 2016). When other studies in the literature are examined, it is observed that female students have higher levels of anxiety and stress than male students (Dadi, 2005; Gupchup et al., 2004). In another study conducted by Sevinç and Özdemir (2017) in Turkey, the trait anxiety levels in female students were reported to be higher than those in men.

The positive effects of music on humans from the past have led to the use of music in wider areas today. The use of music has recently gained importance in reducing the anxiety experienced by many students during the education period. In this study, it was found that music therapy was effective in reducing the state anxiety in nursing students before their first clinical practice but did not affect trait anxiety. Music therapy minimizes the hormonal effects caused by stress, and at the same time, by affecting the autonomic nervous system, it can reduce blood pressure, heart rate, and breathing rate and also reduce feelings such as anxiety and fear by distracting attention to another direction (Karamızrak, 2014; Sezer, 2011). In the study with university students, Wu (2002) reported that after 20 hours of music therapy, students' levels of anxiety, depression, and stress decreased, their self-efficacy increased, and these changes continued even after 2 months. In the study of Barber and Barber (2005) with university students, it has been reported that regularly playing music to students in their favorite areas (canteen, dormitory, etc.) increases their positive emotions and decreases the negative emotions. Sezer (2011) stated that after 8 sessions of music therapy for high school students, two sessions per week for 4 weeks, there was an improvement in students' test anxiety, anger, and psychological symptoms. In the study of İnce and Çevik (2017) in nursing students, it was stated that listening to music during the first blood drawing experience decreased their anxiety level. Besides, there are many studies in the literature with healthy or sick individuals, which show that music therapy positively influences anger, anxiety, emotional-behavioral problems, and other psychological symptoms (Rickson & Watkins, 2003; Sausser & Waller, 2006; Savarimuthu & Bunnell, 2004).

Progressive muscle relaxation exercise allows one to feel the difference between tension and laxity in the body and teaches one to relax by oneself. Relaxation exercise reduces the physical and emotional tension while providing relaxation and rest. Thus, the individual is steered away from the unpleasant stimuli such as anxiety, pain, and stress, which decrease the quality of life and increase endorphin release (Caldeira-Timmins & Timmins, 2014). The effect of progressive muscle relaxation exercise on reducing the state anxiety levels was supported by the findings of our study. However, it was seen that progressive muscle relaxation exercise did not affect the level of trait anxiety. There was a study conducted to evaluate the effect of progressive muscle relaxation on anxiety and stress in nursing students at the beginning of the internship program. In this study, muscle relaxation exercises were taught to the experimental group and applied three times a week for 2 weeks. At the end of the study, when the anxiety levels of the students were examined before the clinical practice, it was de-

termined that there was a significant decrease in the experimental group compared with the control group (Dehkordi et al., 2009). A total of 49 students with high anxiety levels were divided into experimental and control groups in the study conducted to reduce exam anxiety among nursing students; four sessions of progressive muscle relaxation exercises were applied to the experimental group, and a checklist was given for their home practice. When the anxiety levels of the students were examined before the exam, it was determined that there was a significant decrease in the experimental group compared with the control group (Zargarzadeh & Zhirazi, 2014). There was a study conducted to investigate progressive muscle relaxation exercise effectiveness on the anxiety levels before clinical simulation in 15 nursing students. It was reported that the anxiety levels, compared with those before the intervention, decreased in the experimental group and increased in the control group (Carver & O'Malley, 2015). It is stated in many studies that progressive muscle relaxation exercise is used and is effective in students to reduce their anxiety (Ahmadnejad et al., 2011; Dehghan-nayeri & Adib-Hajbaghery, 2011; Dehkordi et al., 2009). Moreover, there are many studies indicating that progressive muscle relaxation exercise positively affects feelings such as anger, anxiety, emotional-behavioral problems, and other psychological symptoms in healthy or sick individuals (Caldeira-Timmins & Timmins., 2017; Robb, 2000; Zargarzadeh & Zhirazi, 2014).

Study Limitations

The interventions were applied in groups owing to the limited time before the clinical practice and the number of practitioners in the academic period. This approach was chosen because of the limited number of participants and the number of interventions applied. The strengths of this study were that the students were randomly assigned to the groups, there was a control group, there was an expert opinion in the applications, and it was applied in accordance with the literature. There was no statistically significant difference between the STAI mean scores compared with the pre-application groups.

Conclusion and Recommendations

According to this study, it was determined that music therapy and progressive muscle relaxation exercise in nursing students before the first clinical experience were effective in reducing the state anxiety levels but not the trait anxiety levels. If these interventions are applied for a long time, it is thought that it may have a positive effect on continuing anxiety levels. In addition, it is suggested that both the interventions should be applied to nursing students in their educational processes owing to the fact that they are easy to apply and are safe and low-cost techniques.

Ethics Committee Approval: This study was approved by Ethics committee of University of Health Sciences (Approval No: 18/46).

Informed Consent: Written informed consent was obtained from the students who agreed to take part in the study.
Peer-review: Externally peer-reviewed.

Author Contributions: Supervision – M.Ş., D.İ.; Design – M.Ş., D.İ.; Supervision – M.Ş.; Resources – D.İ., A.K., İ.T.; Materials – D.İ., A.K.; Data Collection and/or Processing – D.İ., A.K., İ.T.; Analysis and/or Interpretation – D.İ.; Literature Search – D.İ., A.K., İ.T.; Writing Manuscript – D.İ., A.K., İ.T.; Critical Review – M.Ş., D.İ., A.K., İ.T.

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