

The Effect of Mindfulness-Based Stress Reduction Training Given to Young Girls Experiencing Fear of Childbirth on Fear of Childbirth, Coping Strategies with Stress, and State Anxiety Levels

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Abstract

Purpose

This study was conducted to determine the effect of mindfulness-based stress reduction (MBSR) training given to young girls experiencing fear of childbirth on their fear of childbirth, coping strategies with stress, and state anxiety levels.

Methods

The research was completed with 116 students (58 experimental, 58 control group) who experienced fear of childbirth. Data were collected using the Participant Information Form, the State Anxiety Inventory, the Fear of Childbirth Scale, and the Coping Styles with Stress Scale. The girls in the experimental group received a 6-session Mindfulness-Based Stress Reduction Training, while no intervention was applied to the girls in the control group.

Results

Following the mindfulness-based stress reduction training, it was determined that the fear of childbirth levels in the experimental group (32.62 ± 8.26) decreased compared to the control group (40.01 ± 8.89). Problem-focused and emotion-focused coping levels (49.67 ± 4.60) were higher than those of the control group (46.17 ± 5.57), and state anxiety levels (27.34 ± 6.95) were lower compared to the control group (36.44 ± 10.77). A statistically significant difference was found between the groups ($p < 0.005$).

Conclusion

It was concluded that mindfulness-based stress reduction training in young girls reduces the fear of childbirth, increases problem-focused and emotion-focused coping levels, and decreases state anxiety levels.

Introduction

Although childbirth is a physiological process, it is a multifaceted life experience for young girls with intense emotional, cognitive, and psychosocial dimensions (Nilsson et al., 2018; Preis et al., 2018). The process of pregnancy and birth involves elements of stress and anxiety that can challenge both the physical and psychological adaptation mechanisms of young girls (Garthus-Niegel et al., 2018; Bayrampour et al., 2021). Fear of childbirth (FOC) is defined as a significant psychological condition that can adversely affect a young girl's daily life, her adaptation to the pregnancy process, and her attitudes toward birth (Sezen & Ünsalver, 2018; Nilsson et al., 2018). FOC is a complex experience involving feelings of anxiety and uncertainty with varying levels of severity. While mild fear of childbirth is

considered a natural and adaptive response that prepares the young girl for birth, moderate and high levels of fear can transform into a pathological state requiring professional support (Nilsson et al., 2018; Möller, 2019). Young girls experiencing high levels of FOC have serious reservations regarding vaginal delivery, show an increased demand for cesarean sections, and in some cases, may even exhibit tendencies to avoid or terminate pregnancy (Möller, 2019; Gönenç et al., 2020; Stoll et al., 2022; Zhang et al., 2024). The importance of this issue becomes even more evident considering that Turkey ranks first in the world in terms of cesarean section rates (Topaktaş & Beylik, 2024). Studies reveal that high levels of FOC are associated with prolonged labor, increased rates of obstetric intervention, increased perception of pain during delivery, anxiety and emotional instability, difficulties in mother-infant bonding, and an increased risk of postpartum depression and post-traumatic stress disorder (Rouhe et al., 2009; Takegata et al., 2014; Toohill et al., 2014; Nilsson et al., 2018; Zhao et al., 2023; Zhang et al., 2024). Therefore, identifying FOC at an early stage and reducing it through effective intervention methods is critical for protecting maternal and infant health (Bayrampour et al., 2021; Zhang et al., 2024).

In recent years, interest in mindfulness-based approaches—which focus on the awareness and acceptance of experiences rather than suppressing pain and negative emotions—has been steadily increasing (Kabat-Zinn, 2013; Goldberg et al., 2018). The Mindfulness-Based Stress Reduction (MBSR) program is a structured psychoeducation program aimed at developing the ability to stay in the moment by enabling individuals to focus on their thoughts, feelings, and bodily sensations without judgment (Kabat-Zinn, 2013; Creswell, 2017). This approach reduces rumination, enhances emotional regulation skills, and supports psychological well-being (Gu et al., 2015; Goldberg et al., 2018). Specifically, mindfulness-based interventions applied during pregnancy have been shown to significantly reduce levels of stress, anxiety, depression, and fear of childbirth (Zhao et al., 2023; Kaya et al., 2024; Feli et al., 2024; Zhang et al., 2024). Fear of childbirth, along with stress and anxiety experienced during pregnancy, are among the fundamental psychosocial factors that significantly affect young girls' birth experiences, delivery preferences, and postpartum mental adaptation. Although studies in the literature demonstrate that MBSR training is effective in reducing anxiety in pregnant women, research involving young girls appears to be limited (Gokbulut et al., 2024). The vast majority of existing studies have been conducted on pregnant women, and structured mindfulness-based interventions that directly address FOC, stress-coping strategies, and state anxiety together are quite scarce. It is noteworthy that studies examining the implementation and long-term effects of MBSR training specifically for young girls within the framework of a preventive mental health approach are almost non-existent in the Turkish literature. However, adolescence and young adulthood are critical developmental stages where an individual's stress-coping skills, cognitive appraisal processes, and anxiety management are shaped. The psychological resilience and mindfulness-based coping skills acquired during this period can also be decisive for attitudes and perceptions toward potential pregnancy and childbirth processes in the future. In this context, this study, which examines the effects of MBSR training given to young girls on the perception of FOC, stress-coping strategies, and state anxiety levels, is one of the first research projects conducted in this field in Turkey. It is anticipated that this study will contribute to the dissemination of mindfulness-based approaches within preventive mental health services, provide scientific evidence for the early prevention

of fear of childbirth, and significantly contribute to the development of holistic approaches in midwifery and nursing care.

Methods

The aim of this study is to examine the effect of mindfulness-based stress reduction training given to young girls on their fear of childbirth, stress-coping strategies, and state anxiety levels.

Hypotheses:

- **H1:** The mean fear of childbirth scores of the young girls in the intervention group are significantly lower than those in the control group.
- **H2:** The mean stress-coping scores of the young girls in the intervention group are significantly higher than those in the control group.
- **H3:** The mean state anxiety scores of the young girls in the intervention group are significantly lower than those in the control group.

Study Design

The research is an experimental study with a pretest-posttest control group design.

Setting and Time of the Study

The study was conducted at the Faculties of Nursing and Health Sciences of XXX University between June and September 2021.

Population and Sample

The population of the study consisted of 835 female students studying at the Faculty of Nursing and Health Sciences of İnönü University. According to the power analysis performed (for a randomized controlled trial), with an effect size of 0.7, a 5% margin of error, a 95% confidence interval, and a 98% population representation power, the sample size was determined to be at least 110 students (55 experimental, 55 control). The students to be included in the study were selected using a computer-aided simple random sampling method. This method generated a random list that assigned students to two groups at a 1:1 ratio. The assignment of two sets, formed according to the students' school numbers, into experimental and control groups was determined by the lottery method. To account for potential dropouts, + 5% additional participants were included, resulting in a final sample size of 116 (58 intervention, 58 control). The study was completed with 116 students.

Inclusion Criteria:

- Experiencing fear of childbirth (assessed via the Fear of Childbirth Scale).

Exclusion Criteria:

- Having any physical or mental health problems that would hinder the training.

Data Collection Tools

Data were collected using the Participant Information Form, the State Anxiety Inventory, the Fear of Childbirth Scale, and the Coping Styles with Stress Scale.

Data Collection

Data were collected by researchers in the faculty laboratories using the face-to-face interview method. The Participant Information Form, Fear of Childbirth Scale, State Anxiety Inventory, and Coping Styles with Stress Scale were used as pretest forms. The Fear of Childbirth Scale, State Anxiety Inventory, and Coping Styles with Stress Scale were applied as posttests.

Participant Information Form

The participant information form consists of 5 questions regarding the socio-demographic characteristics of the students.

Pre-pregnancy Fear of Childbirth Scale

The Pre-pregnancy Fear of Childbirth Scale was developed by Stoll et al. (2016). It is a self-reported scale that measures pre-pregnancy fear of childbirth in young women and men. The scale covers dimensions that most cause fear of childbirth: labor pain, loss of control, inability to cope with labor pain and birth, complications, and irreversible physical damage. The scale consists of ten items with responses rated on a 6-point Likert scale (1 = "Strongly disagree" to 6 = "Strongly agree"). The minimum score is 10 and the maximum score is 60. A higher total score indicates a higher level of fear. The Cronbach's alpha value of the scale is 0.86.

State Anxiety Inventory (SAI)

The scale was developed by Spielberger et al. (1970) and adapted into Turkish by Öner and Le Compte (1983). The State Anxiety Inventory consists of 20 items. The State Anxiety Subscale (STAI-S) requires the individual to describe how they generally feel at a particular moment and under certain conditions. Theoretically, scores obtained from the scale range between 20 and 80. A higher score indicates a higher level of anxiety, while a lower score indicates a lower level of anxiety. The response options, categorized

into four classes, are (1) Not at all, (2) Somewhat, (3) Moderately so, and (4) Very much so. There are ten reverse-scored items in the scale (Items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20).

Coping Styles with Stress Inventory

The "Ways of Coping Inventory," originally developed by Folkman and Lazarus (1980), was rearranged by Şahin and Durak in 1995 as the "Coping Styles with Stress Scale," consisting of 30 items and 5 subscales (self-confident approach, optimistic approach, helpless approach, submissive approach, and seeking social support). The subscales are independent and can be scored separately. High scores obtained from the subscales indicate that the individual uses that specific stress-coping technique more frequently. The Cronbach's alpha reliability coefficient of the scale was found to be 0.68, and the reliability coefficients of the five subscales were calculated to range between 0.45 and 0.80. Accordingly, the scale consists of 5 sub-factors: self-confident approach (SCA), helpless approach (HA), submissive approach (SA), optimistic approach (OA), and seeking social support (SSS).

Items 8, 10, 14, 16, 20, 23, and 26 constitute the SCA; items 2, 4, 6, 12, and 18 constitute the OA; items 3, 7, 11, 19, 22, 25, 27, and 28 constitute the HA; items 5, 13, 15, 17, 21, and 24 constitute the SA; and items 1, 9, 29, and 30b constitute the SSS sub-factor. The 30 questions and 5 sub-groups of the scale are converted into two main coping styles: "Problem-focused/active" and "Emotion-focused/passive." The active styles include the SCA, OA, and SSS subscales, while the passive styles consist of the HA and SA subscales. Higher scores indicate more frequent use of that style. The total score ranges from a minimum of 30 to a maximum of 120.

Study Variables

- **Dependent Variables:** Fear of Childbirth, State Anxiety, Coping Styles with Stress.
- **Independent Variable:** Mindfulness-Based Stress Reduction (MBSR) Training.

Intervention

Before starting the MBSR training, the researcher explained the objective of the study and the content of the training to the experimental group. Training dates were then scheduled with the students. Participants in the experimental group were divided into 5 groups of 10 people each. Training was provided for 6 weeks, twice a week for 50 minutes for each group. Pretests were administered to the experimental group in the first session, followed by the 6-week MBSR training. Posttests were administered after the training. No intervention was applied to the control group.

Intervention Material: MBSR Training Booklet

The MBSR training booklet was prepared by the researcher by reviewing the relevant literature. The MBSR sessions were structured as follows:

- **Session 1:** Preparation phase (meeting with students, providing information, and administering pretests).

- **Session 2:** Information about the process by explaining the physiology and stages of childbirth. Explaining the definition of fear of childbirth.
- **Session 3:** Teaching stress-coping techniques.
- **Session 4:** Teaching breathing exercises.
- **Session 5:** Teaching relaxation techniques.
- **Session 6:** Mindfulness-based yoga training.
- **Session 7:** Conducting mindfulness meditation.
- **Session 8:** Evaluation of the training by administering posttests.

Data Analysis

The coding and statistical analysis of the raw data were performed on a computer using the SPSS (Statistical Package for Social Science) 22.0 software package. Paired-sample t-tests for dependent groups, independent-sample t-tests for independent groups, and descriptive statistics were utilized for data evaluation. In all analyses, the confidence interval was set at 95%, and the significance level was determined as $p < 0.05$.

Ethical Principles of the Research

Since the use of human subjects in research requires the protection of individual rights, the "informed consent" requirement was fulfilled as an ethical principle. To conduct the research, approval was obtained from the Non-Interventional Ethics Committee of İnönü University. Official permission was secured from the faculty where the research was carried out. Written informed consent was obtained from the students included in the study.

Results

Table 1. Distribution of the Socio-Demographic Characteristics of the Young Girls in the Experimental and Control Groups

Socio-demographic Characteristics		Experimental Group (n=58)		Control Group (n=58)		Test and Significance
		n	%	n	%	
Age						$\chi^2=0.200$
18-20 years old		14	24.1	18	31.0	p=0.460
21-25 years old		44	75.9	40	69.0	
Place of residence		34	58.6	27	46.6	$\chi^2=1.694$
Province / City Center						p=0.193
District / Town / Village		24	41.4	31	53.4	
Income Status						$\chi^2=1.650$
Income less than expenses		9	15.5	11	19.0	p=0.438
Income equal to expenses		43	74.1	37	63.8	
Income more than expenses		6	10.3	10	17.2	
Age (Years)	X±SS	X±SS	t=0.226			
	20.74±0.73	20.70±0.89	p=0.822			

SD: Standard Deviation

The mean age of the young women participating in the study was determined to be 20.74 $\pm$ 0.73 in the experimental group and 20.70 $\pm$ 0.89 in the control group ($p > 0.05$). When analyzed in terms of place of residence, it was found that 58.6% of the experimental group and 53.4% of the control group lived in a district ($p > 0.05$). Additionally, it was determined that 74.1% of the experimental group and 63.8% of the control group had an income equal to their expenses ($p > 0.05$). In the study, no statistically significant difference was found between the socio-demographic characteristics of the young women in the experimental and control groups.

Tablo 2. Comparison of pre-test and post-test mean scores for total and sub-dimensions of childbirth fear, trait anxiety, and coping with stress scales in the experimental group.

Scales and Sub-dimensions	Pre-test (n=58)	Post-test (n=58)	Test and Significance
	X±SS	X±SS	
Childbirth Fear Scale	39.06±9.20	32.62±8.26	t= 7.442 p<0.001
Problem-Focused Coping	45.18±6.76	49.67±4.60	t= -6,098 p<0.001
Emotion-Focused Coping	26.36±6.09	30.91±7.00	t=-4,736 p<0.001
Trait Anxiety Scale	36.53±11.48	27.34±6.95	t= 9.230 p<0.001

Table 2 presents the comparison of the pre-test and post-test mean scores for the childbirth fear scale, trait anxiety scale, and sub-dimensions of the coping with stress styles scale among the young women in the experimental group. The mean pre-test score of the young women in the experimental group on the Childbirth Fear Scale was 39.06±9.20, while the mean post-test score was 32.62±8.26, indicating a statistically significant difference between the tests ($p<0.001$). The mean total score of the Trait Anxiety Scale was found to be 36.53±11.48 in the pre-test and 27.34±6.95 in the post-test, with the difference being statistically significant ($p<0.05$). Regarding the sub-dimensions of the Coping with Stress Styles Scale, the mean score for the Active Style (Problem-focused) was 45.18±6.76 in the pre-test and 49.67±4.60 in the post-test, showing a statistically significant difference ($p<0.001$). The mean score for the Passive Style (Emotion-focused), another sub-dimension of the scale, was 26.36±6.09 in the pre-test and 30.91±7.00 in the post-test. A statistically significant difference was found between the mean total scores of the groups ($p<0.001$).

Table 3. Comparison of pre-test and post-test mean scores for total and sub-dimensions of childbirth fear, trait anxiety, and coping with stress styles scales in the control group.

Scales and Sub-dimensions	Pre-test (n=58)	Post-test (n=58)	Test and Significance
	X±SS	X±SS	
Childbirth Fear Scale	40.27±8.924	40.01±8.89	t=0.591 p=0.557
Problem-Focused Coping	46.60 ±6.23	46.17±5.57	t= 0.800 p>0.005
Emotion-Focused Coping	31.13 ±5.97	30.72±7.13	t=0.926 p>0.005
Trait Anxiety Scale	36.44±11.52	36.44±10.77	t= 0.000 p>0.005

The comparison of the pre-test and post-test mean scores for the childbirth fear scale, trait anxiety scale, and sub-dimensions of the coping with stress styles scale among the young women in the control group is presented in Table 3. The mean pre-test score of the young women in the control group on the Childbirth Fear Scale was determined to be 40.27±8.92, while the post-test mean score was 40.01±8.89, and no statistically significant difference was found between the groups (p=0.557). The mean total score of the Trait Anxiety Scale was found to be 36.44±11.52 in the pre-test and 36.44±10.77 in the post-test, with no statistically significant difference observed between them (p>0.05). Regarding the sub-dimensions of the Coping with Stress Styles Scale, the mean score for the Active Style was 46.60±6.23 in the pre-test and 46.17±5.57 in the post-test, and no statistically significant difference was found between the groups (p>0.05). The mean score for the Passive Style, another sub-dimension of the scale, was determined to be 31.13±5.97 in the pre-test and 30.72±7.13 in the post-test. No statistically significant difference was found between the mean total scores of the groups (p>0.05).

Discussion

Fear of childbirth is common among young women in the preconception period (Žigić Antić et al., 2019). In this study, the pre-education fear of childbirth levels of young women in both the experimental and control groups were found to be above average. Some studies in the literature similarly suggest that the level of fear of childbirth before pregnancy in nulliparous young women is at a moderate level (Gür et al., 2022; Kaymaz and Aktaş, 2024; Avcıbay et al., 2021; Sunay et al., 2021). This finding reveals that although the perceptions of young women who have not yet experienced pregnancy involve anxiety and uncertainty, they do not reflect a clinically pathological level of fear. However, it is thought that experiencing fear at this level will significantly influence their future mode of delivery. Fear of childbirth is

affected by factors such as previous experiences, pain, and lack of self-control (Bilge et al., 2022). Additionally, conditions such as stress, anxiety, lack of social support, uncertainty, and negative birth stories contribute to the fear of childbirth (Dencker et al., 2019).

In this study, when the post-education total mean scores of the fear of childbirth scale were compared between the experimental and control groups, a statistically significant difference was identified ($p < 0.05$). It was found that the difference between the pre-test and post-test total scores of the experimental group, which received Mindfulness-Based Stress Reduction (MBSR) training, was statistically significant ($p < 0.001$); however, no significant change was observed in the total scores of the control group ($p > 0.05$). This finding suggests that mindfulness-based approaches may have a positive effect on childbirth-related fear and anxiety. A review of the literature reveals no mindfulness-based studies conducted specifically with young women experiencing fear of childbirth. However, studies conducted with pregnant women have similarly found that mindfulness-based stress reduction training reduces the fear of childbirth (Güney et al., 2022; Gokbulut et al., 2024). In parallel with these studies conducted in our country, an international meta-analysis determined that mindfulness-based interventions have potential effects in reducing the fear of childbirth and improving birth-related outcomes (Wang et al., 2026).

High levels of fear of childbirth are associated with an individual's anxiety level, the pain they anticipate feeling during delivery, and the information they have acquired regarding birth (Žigić Antić et al., 2019). In this study, considering the total mean scores of the trait anxiety levels of individuals in the experimental and control groups before the education, it was observed that their anxiety levels before pregnancy were at a moderate level. This finding suggests that while there is a relationship between the fear of childbirth and anxiety, moderate anxiety during the preconception period may progress during pregnancy and trigger the fear of childbirth. A review of the literature reveals a lack of research specifically examining anxiety levels in young women with a fear of childbirth. However, studies conducted with different groups are available. Indeed, studies involving nulliparous pregnant women have reported that the majority experience severe anxiety (Benyian, 2023). Similarly, a study conducted with pregnant women experiencing fear of childbirth reported that half of the participants had a prevalence of anxiety, particularly during the late stages of pregnancy (Hildingsson et al., 2021). In this study, a statistically significant difference was identified in the comparison of post-education trait anxiety scale total mean scores between the experimental and control groups ($p < 0.05$). Furthermore, a statistically significant difference was found between the pre-test and post-test trait anxiety scale total mean scores of the experimental group ($p < 0.05$), while no such difference was observed for the control group ($p > 0.05$). The decrease in the trait anxiety levels of women in the experimental group following the education suggests that Mindfulness-Based Stress Reduction (MBSR) has a positive impact on anxiety. Therefore, identifying anxiety levels in the preconception period and supporting individuals with preventive psychoeducational interventions would be a crucial approach in preventing the escalation of childbirth fear (Wang et al., 2026; Güney et al., 2022).

These results are consistent with studies in the literature examining the effects of mindfulness-based interventions. A mindfulness-based study showed that such an approach reduced pregnancy-related anxiety in nulliparous women (Dafei M et al., 2020). Another study conducted with pregnant women found that the MBSR method reduced anxiety levels (Zarenejad M et al., 2020). These results suggest that the body awareness and mindfulness meditations provided by MBSR enable individuals to develop a more non-judgmental approach to anxiety-inducing thoughts, thereby effectively reducing anxiety levels.

Regarding the mean scores for the Coping with Stress Styles Scale, the participants in both the experimental and control groups exhibited moderate coping levels before pregnancy. This finding suggests that while participants possess certain coping strategies, the efficacy of these strategies may be limited. These results align with similar studies in the literature. A study conducted with midwifery students reported that pre-pregnancy stress-coping styles were at a moderate level (Sunay et al., 2021). Similarly, a study involving postpartum women reported that the level of coping styles regarding the fear of childbirth was moderate (Wang Y et al., 2025).

In the study, a statistically significant difference was identified in the comparison of post-education mean scores for problem-focused coping styles between the experimental and control groups ($p < 0.05$). Furthermore, a statistically significant difference was observed between the pre-test and post-test mean scores for emotion-focused coping styles in the experimental group ($p < 0.05$). No statistically significant difference was found between the pre-test and post-test mean scores of the control group regarding the coping with stress styles scale ($p > 0.05$). Following the education, it was observed that the problem-focused and emotion-focused coping levels of the women in the experimental group increased. This improvement in coping strategies indicates that Mindfulness-Based Stress Reduction (MBSR) training has a positive impact on coping skills. Similarly, a review of the literature shows that mindfulness-based studies conducted with different groups found a decrease in prenatal stress levels following the intervention (Lönnberg et al., 2020; Pan et al., 2023). These results demonstrate that MBSR is a beneficial intervention for young women in managing stress. This suggests that utilizing stress-coping techniques, such as breathing and relaxation exercises, can effectively reduce the fear of childbirth. These findings indicate that MBSR training reduces both the fear of childbirth and state anxiety levels, while positively enhancing stress-coping skills in young women with childbirth fear. This period is a critical stage where beliefs and attitudes toward childbirth are developed and shaped. This stage may play a decisive role in future pregnancy, birth experiences, and birth preferences. Therefore, mindfulness-based approaches can enable young women to increase their bodily and emotional awareness, allowing them to address their fears regarding the birthing process within a more realistic and manageable framework. In conclusion, Mindfulness-Based Stress Reduction (MBSR) is considered a powerful intervention that supports psychological well-being, reduces anxiety levels, and provides effective coping skills for young women experiencing fear of childbirth. Accordingly, it is recommended to expand mindfulness-based training within the scope of health programs, youth counseling centers, and primary healthcare services. Furthermore, future studies conducted in different socio-cultural groups are expected to more comprehensively reveal the role of such education in protective and preventive mental health services.

Limitations of the Study

The small sample size of the study group may limit the generalizability of the results to all young women or prospective mothers. Since the research was conducted in only one city and at a single university, the findings may not fully reflect individuals from diverse socio-cultural backgrounds. Furthermore, the focus being solely on "young women" excludes the experiences of older women or those who are currently pregnant. Lastly, the impact of the MBSR training was measured only immediately after the intervention; therefore, follow-up measurements to assess the long-term sustainability of improved coping skills and the reduction in childbirth fear could not be performed.

Declarations

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Authors' contributions **Hacer ÜNVER KOCA:** Writing – original draft, Writing – review & editing, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Fadime BİÇER ŞAHİN:** Writing – original draft, Writing – review & editing, Validation, Methodology, Data curation, Conceptualization. **Lale ÜNVER AYDIN:** Writing – original draft, Writing – review & editing, Validation, Methodology, Data curation, Conceptualization. **Zeynep ÜNVER:** Writing – original draft, Writing – review & editing, Conceptualization. **Funda KAVAK BUDAK:** Methodology, Formal analysis.

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Data availability Additional data on the study can be provided by the corresponding author if requested.

Ethics approval and consent to participate Ethical approval for this study was obtained from the İnönü University Scientific Research Ethics Committee for Health Sciences (Decision No: 2021/599).

Consent for publication Not applicable.

Competing interest The authors declare that they have no competing interests.

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