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Do Parents' Dental Neglect and Anxiety Affect Their Children's Dental Neglect and Anxiety?

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ABSTRACT

Aim: Dental neglect is an obstacle to obtaining the necessary dental care in protecting and maintaining basic oral health. Dental anxiety can cause difficulties in behavior management, maintenance of dental treatments, and poor oral hygiene. In this study, it was aimed to examine the relationship between dental neglect and anxiety levels of both parents and their children.

Material and Methods: 220 people including 110 parents and 110 children were included in the study. The Dental Neglect Scale (DNS), Modified Dental Anxiety Scale (MDAS), and Visual Analogue Scale (VAS) were used for parents. In addition, the Dental Neglect Scale (DNS), the Faces version of the Modified Child Dental Anxiety Scale (MCDASf), and the Wong Baker Faces Pain Rating Scale (WBFS) were applied to children. The statistical analysis was performed using Spearman Correlation test and Mann Whitney-U test.

Results: In the study, a positive correlation was found between parent's and children's neglect scores (r=0.261; p=0.006). Likewise, a positive correlation was observed between the DMFT and anxiety scores of the children (r=0.237; p= 0.013). In addition, it was observed that there was a statistical correlation between the level of pain felt at the last dental treatment and anxiety in children (r=0.316; p=0.001).

Conclusion: It was observed that the dental neglect of the children of parents who neglected their own oral health increased. It is thought that informing parents about the importance of oral health and the consequences of dental neglect will have positive effects on their children's oral health.

Ebeveynlerin Dental İhmal ve Anksiyete Düzeyleri Çocuklarının Dental İhmal ve Anksiyete Düzeylerini Etkiler mi?

Makale Bilgisi

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ÖZET

Amaç: Dental ihmal, temel ağız sağlığının korunması ve sürdürülmesinde gerekli dental bakımın alınması için engel teşkil etmektedir. Dental anksiyete ise; davranış yönlendirilmesinde, dental tedavilerin idamesinde zorluklara ve kötü ağız hijyenine sebep olabilmektedir. Bu çalışmada ebeveynlerin ve çocuklarının dental ihmal ve anksiyete düzeyleri arasındaki ilişkinin incelenmesi amaçlandı.

Gereç ve Yöntemler: Çalışmaya 110 ebeveyn 110 çocuk olmak üzere 220 kişi dahil edildi. Ebeveynler için Dental İhmal Ölçeği [Dental Neglect Scale (DNS)], Modifiye Edilmiş Dental Anksiyete Ölçeği [Modified Dental Anxiety Scale (MDAS)] ve Görsel Analog Ölçeği [Visual Analogue Scale (VAS)] kullanıldı. Çocuklar üzerinde ise Dental İhmal Ölçeği [Dental Neglect Scale (DNS)], Modifiye Çocuk Dental Anksiyete Ölçeği Yüz Versiyonu [MCDASf] ve Wong Baker Ağrı Değerlendirme Ölçeği [Wong–Baker Faces Pain Rating Scale (WBFS) uygulandı. Verilerin analizi Spearman Korelasyon testi ve Mann Whitney-U testi ile yapıldı.

Bulgular: Çalışmada ebeveynlerin ve çocukların ihmal değerleri arasında pozitif korelasyon olduğu bulundu (r=0,261; p=0,006). Ankete katılan çocukların DMFT ve anksiyete değerleri arasında pozitif bir korelasyon gözlendi (r=0,237; p= 0,013). Ayrıca çocuklarda son dental tedavide hissedilen ağrı düzeyi ile anksiyete arasında istatistiksel olarak ilişkili olduğu görüldü (r=0,316; p=0,001).

Sonuç: Kendi ağız sağlığını ihmal eden ebeveynlerin çocuklarının dental ihmal düzeyinin arttığı görüldü. Ebeveynlerin ağız sağlığının önemi ve dental ihmalin sonuçları konusunda bilgilendirilmesinin çocuklarının ağız sağlığı üzerinde pozitif etkileri olacağı düşünülmektedir.

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INTRODUCTION

Dental negligence is defined as not taking the necessary precautions to protect basic oral health, preventing pain, infection and loss of function, and not performing the needed dental treatment.[1] It is the responsibility of parents or caregivers to follow the health-related needs of children and protect their oral health. Since children's motor skills do not develop sufficiently before the age of 3, they cannot meet their self-care needs without parental help. Although the child wants to take over oral care, which is one of the self-care habits, from the parent after about the age of 3, the parent must accompany the brushing as they cannot provide effective cleaning on their own until the age of 6.[2]

Tooth decay that is not treated early can have negative effects on the child's overall health and quality of life. Children who are exposed to untreated severe early childhood caries that cause negative conditions such as pain, infection and trauma are dragged into dental neglect.[3,4] Parents' attitudes, knowledge and thoughts on the subject are very important in preventing the development of caries in children and maintaining oral health.[5,6] Parents need to accept oral health as a part of general health and be aware that tooth decay is a preventable condition with early preventive approaches.[7] The Dental Neglect Scale is used to evaluate the extent to which the parent or caregiver is interested in the child's oral health, how often they take them to the dentist, and their awareness of oral health. DNS is viewed as an important tool to help identify the cause of poor oral health in children.[8]

Dental anxiety, which is a problem that affects large masses and can be encountered by every individual, is the feeling of discomfort that may occur towards the dentist and the treatment.[9] Dental anxiety causes the child to resist the parent and the dental team, leading to difficulties in behavioral management, avoidance of dental treatment, and consequences such as poor oral health.[10] It is necessary to evaluate and prevent dental anxiety in order to overcome these problems, facilitate diagnosis and treatment, and also ensure an enjoyable dentist visit.[11]

Numerous factors, including age, gender, education, socioeconomic background, and the number of siblings, have been found to influence children's dental fear.[12] Numerous surveys have been conducted to evaluate the influence of particular factors on dental anxiety.[12,13] There is a correlation between a parent's dental anxiety and their child's dental anxiety, and the family's attitude has been found to be significant in the development of dental anxiety.[14] Considering that families are role models for their children in the development of dental fear and anxiety, it has been reported that families' awareness and knowledge on this subject can help reduce children's anxiety level.[15]

For this purpose, the oral health, dental neglect and anxiety levels of the mothers and children in the current study were determined and the relationships between them were examined. In addition, an assessment was conducted regarding the impact of anxiety and neglect on dental health.

MATERIALS AND METHODS

Ethical Approval

This study was reviewed by the Recep Tayyip Erdoğan University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee and was approved with protocol number 2019/171. Parents who were informed about the content of the research and whose written consent was obtained were included in the study.

Study Design and Sample Size

This cross-sectional study was carried out on children who applied to the Recep Tayyip Erdoğan University Faculty of Dentistry, Department of Pedodontics, for examination and treatment between October 2022 and April 2022. Children between the ages of 6 and 12, who did not have any

physical/mental disabilities or systemic diseases, and their parents were included in the study. According to the sample calculation made with the G-Power program, the minimum number of participants was determined as 220 (110 children and 110 parents) with 95% confidence (1-α), 95% (1-β) test power and d = 0.445 effect size. [16]

Implementation of Surveys

In the first stage of the study, after demographic information was recorded in the survey form prepared for the parents, DNS and MDAS were applied to the parents. In addition, the parents were questioned about their visits to the dentist in the last 6 months, and the level of pain they felt during the last dental treatment was determined using the Visual Analogue Scale (VAS).

In the second phase of the study, DNS and the Modified Child Dental Anxiety Scale Facet Version ($MCDAS_f$) were administered to the children. The level of pain felt by the children during their last dental treatment was recorded with the Wong Baker Pain Rating Scale (Wong–Baker Faces Pain Rating Scale (WBFS).

Dental Neglect Scale (DNS)

The six questions included in the DNS, which was used to measure the dental neglect levels of the parents participating in the study, are given in the Figure 1. Each question in the scale is evaluated between 1 (I completely agree) and 5 (I completely disagree).[17] The total DNS score varies between 6 and 30, and an increase in the score indicates high dental neglect.

Figure 1. Questions of Dental Neglect Scale[17]

	DNS for Parents	DNS for Children
1	I do my dental care at home	My child does his own oral care at home
2	I get the necessary dental care	My child gets the necessary dental treatment
3	I need dental care, but I postpone it	My child brushes his teeth as much as necessary
4	I brush my teeth enough	My child controls his snacks between meals as much as necessary
5	I control my snacks sufficiently	My child believes that his oral health is important
6	I know that oral health is important	My child needs dental treatment, but I am postponing it
7	-	My child needs dental treatment, but she/he is postponing it.

There are 7 questions in the DNS used to evaluate the dental neglect levels of the children participating in the study. These questions are also shown in the Figure 1. Each question in the scale is evaluated between 1 (I completely agree) and 5 (I completely disagree).[8] The total DNS score varies between 7 and 35, and an increase in the score indicates high dental neglect.

Modified Dental Anxiety Scale (MDAS)

The 5 questions in the MDAS, which is a valid and useful method to measure parents' dental anxiety levels, are shown in the Figure 2. Each question in the scale is evaluated between 1 (No worry) and 5 (Extremely anxious). The total score in MDAS varies between 5 and 25, and an increase in the score indicates high dental anxiety.[18]

Figure 2. Modified Dental Anxiety Scale[18]

1	How would you feel if you were going to the dentist tomorrow?
2	How would you feel if you were sitting in the waiting room for treatment?
3	How would you feel if one of your teeth were to be filled?
4	How would you feel if your teeth were to be cleaned and polished?
5	How would you feel if local anesthesia was injected into your gum above your upper back

Modified Children's Dental Anxiety Scale Faced Version ($MCDAS_f$)

The 8 questions included in the MCDASf, which is used to measure children's dental anxiety levels, are given in the Figure 3. Each question in the scale is evaluated between 1 (Comfortable - Not Worried) and 5 (Very worried). The total score in MCDASf varies between 8 and 40, and an increase in the score indicates high dental anxiety.[19]

Figure 3. Modified Children's Dental Anxiety Scale Faced Version[19]

1	How do you feel when you go to the dentist?	
2	How do you feel when your teeth are looked at?	
3	How do you feel when your teeth are cleaned and polished?	
4	How do you feel when your gums are injected?	
5	How do you feel when you have a filling in your tooth?	
6	How do you feel when your tooth is extracted?	
7	How do you feel when you are put to sleep for dental treatment?	
8	How do you feel when you receive a mixture of gas and air that does not make you sleep but helps you relax for the treatment?	

Visual Analogue Scale (VAS)

VAS, which is an effective, easy-to-understand measurement tool, is also frequently used to measure pain parameters. The scale

consists of a line 10 cm long horizontally. There are numbers between 0 and 10 on the line. 0 = No pain, 10 = Worst/Unbearable pain. After the procedure, the patient is asked to give a value between these two numbers on the scale shown, depending on the level of pain he/she feels.[20]

Wong Baker Pain Rating Scale (WBFS)

It is used as a valid and reliable scale in the evaluation of pain because it is easily and quickly understood by children.[21] In this scale, where facial expressions are evaluated, there are 6 facial expressions rated from 0 to 10 according to the severity of pain. Scores from the scale between 0 and 4 indicate mild pain, scores between 4 and 6 indicate moderate pain, scores between 6 and 8 indicate severe pain, and scores between 8 and 10 indicate unbearable pain.

Clinical Evaluation

According to WHO guidelines, a single doctor performed intraoral examinations under reflector light on the children and their parents who completed the survey. The examinations involved the use of a mirror and an examination probe. Accordingly, the oral health of children and their parents was evaluated using the number of decayed, filled, and extracted teeth (Decayed, Missing, and Filled Teeth (DMFT)) and the Simplified Oral Hygeine Index (OHI-S).[22,23]

For the OHI-S index, the buccal surfaces of teeth 16 and 26, the lingual/palatal surfaces of teeth 36 and 46, and the labial surfaces of teeth 11 and 31 were examined. In case the tooth to be used was missing, symmetrical tooth/teeth were examined. In the scoring between 0 and 3, 0 = “no plaque”, 1 = “less than 1/3 plaque”, 2 = “1/3 to 2/3 plaque”, and 3 = “more than 2/3 plaque”. The OHI-S plaque value for the patient was calculated by dividing the total value obtained by 3.

Statistical analysis

IBM SPSS Statistics 21.0 program was used for statistical evaluation. The descriptive analysis of the study were given with mean, standard deviation, median, minimum and maximum values. Mann Whitney U test was used to analyze variables that did not show normal distribution. Spearman Correlation test was applied to analyze the measurement data. Statistical significance level was accepted as $p<0.05$.

RESULTS

The survey was conducted on 110 children aged 6-12 and their parents. Table 1 provides the study participants' demographic information. It was found that 49.1% of the children were males and 50.9% were girls. The average age was determined as 8.55±1.80. It was observed that 92.7% of the children did not have a systemic disease, 3.6% did not visit the dentist in the last 6 months, and 37.3% were the first child of the family. While 75.5% of the parents participating in the survey were observed to be female, it was determined that 70.9% did not have a systemic disease. It was also determined that 58.2% did not visit the dentist in the last 6 months.

Table 2 has shown the average index values for the parents children involved in the survey. Children's neglect, anxiety, DMFT, OHIS mean and standard deviation values were 13.75±4.1, 19.63±6.6, 6.73±2.9, 0.92±0.6, respectively. Parents' neglect, anxiety, DMFT, OHIS mean and standard deviation values were 13.28±4.2, 8.77±4.6, 10.46±5.4, 1.28±0.9, respectively. While the average pain level felt during the last treatment was 1.77±2.2 in children, it was found to be 2.45±3.1 in parents.

The correlation analysis of the measured index values of the children and parents in the study is given in Table 3. There was no significant association between the parameters evaluated in children and neglect values ($p>0.05$). Also, there was no statistically significant association between the parameters evaluated in parents and neglect values ($p>0.05$). A positive relationship ($r = 0.261$; $p = 0.006$) was found between the neglect values of children and their parents. Consequently, it was established that parents who neglected their

own oral health also significantly neglected their children's oral health.

A positive correlation was observed between anxiety and DMFT values of the children participating in the study (r = 0.237; p = 0.013). Consequently, it was determined that the DMFT values of children with high anxiety levels also increased. Additionally, a positive relationship was detected between anxiety in children and the degree of pain felt during the last dental treatment (r=0.316; p=0.001). It was observed that the child's past painful dental experiences negatively affected the anxiety value.

A positive correlation was detected between the level of pain felt during the last dental treatment and anxiety values in the parents who participated in the survey, as in the children (r = 0.256; p = 0.007). While it was seen that the pain levels felt by the child and their parents during the last dental treatment were related to their own anxiety values, there was no important relationship between the anxiety values of the child and their parents (p>0.05).

Table 4 shows the relationship between the child's neglect and anxiety values and other variables. Accordingly, a significant relationship was found between the children's anxiety values and their ages (p = 0.03). It was observed that as the children's ages increased, their anxiety levels decreased. There was no significant association between the other evaluated parameters and neglect and anxiety values (p>0.05).

Table 1: Demographic characteristics of the participants in the study

	PARENTn (%)	**CHILD** n (%)
Gender		
Female	83 (75.5)	56 (50.9)
Male	27 (24.5)	54 (49.1)
Systemic Disease		
Yes	32 (29.1)	8 (7.3)
No	78 (70.9)	102 (92.7)
Dental Visit		
I have been to the dentist in the last months	46 (41.8)	106 (96.4)
I haven’t been to the dentist in the last months	64 (58.2)	4 (3.6)
Birth Order		
First Child	-	41 (37.3)
≥ Second Child	-	69 (62.7)

Table 2: Average index values of the parents and children included in the study

	PARENT		**CHILD**	
	Mean ±SD	M (Min-Max)	Mean ±SD	M (Min-Max)
Dental Neglect	13.28±4.2	13 (6-26)	13.75±4.1	13 (7-26)
Anxiety	8.77±4.6	7 (1-25)	19.63±6.6	19.5 (8-40)
Pain felt during last treatment	2.45±3.1	1 (0-10)	1.77±2.2	2 (0-10)
OHI-S	1.28±0.9	1 (0-6)	0.92±0.6	1 (0-5)
DMFT	10.46±5.4	9 (2-26)	6.73±2.9	6 (1-16)

SD: Standard deviation M: Median Min: Minimum, Max: Maximum

Tablo 3: Correlation analysis of index values of the parents and children included in the study

			PARENT					CHILD				
			DMFT	OHI-S	Pain	Anxiety	Neglect	DMFT	OHI-S	Pain	Anxiety	Neglect
PARENT	DMFT	r	1									
	OHI-S	r	0.034	1								
	Pain	r	0.078	0.170	1							
	Anxiety	r	0.070	0.163	**0.256***	1						
	Neglect	r	0.007	0.181	0.020	0.151	1					
CHILD	DMFT	r	0.008					1				
	OHI-S	r		0.058				0.096	1			
	Pain	r			0.023			0.157		1		
	Anxiety	r				0.047		**0.237***	0.165	**0.316***	1	
	Neglect	r					**0.261***	0.127	0.103	0.048	0.002	1

Table 4: Examination of children's average neglect and anxiety values and demographic data

	Neglect		Anxiety	
	Mean ±SD	M(Min-Max)	Mean ±SD	M(Min-Max)
Age (Year)				
6-9	13.93±4.3	13(7-26)	20.54±6.7	21(8-40)
10-12	13.35±3.4	13(7-21)	17.59±5.9	17(8-33)
p value		0.851		**0.03***
Gender				
Female	12.79±3.5	12(7-22)	20.09±7.2	20(8-40)
Male	14.76±4.4	14(7-26)	19.15±5.9	19(9-35)
p value		0.376		0.457
Systemic disease				
Yes	12±1.5	11.5(10-14)	19.12±6.7	19(10-30)
No	13.89±4.2	13(7-26)	19.67±6.6	19.5(8-40)
p value		0.208		0.268
Dental visit				
I have been to the dentist in the last months	13.77±4.1	13(7-26)	19.62±6.5	19.5(8-40)
I haven't been to the dentist in the last months	13.25±1.7	13.5(11-15)	19.75±8.6	21.5(8-28)
p value		0.917		0.156
Birth order				
First child	14±4.3	13(7-26)	19.41±6.9	18(8-40)
≥ second child	13.61±3.9	13(7-26)	19.75±6.4	20(9-35)
p value		0.537		0.669

SD: Standard deviation, M: Median, Min: Minimum, Max: Maximum

DISCUSSION

Dental neglect is characterized by the physical neglect of the oral cavity, the failure to provide dental care, and the lack to take the required precautions to maintain oral health.[8] Dental anxiety is expressed as a state of intense uneasiness that cannot be fully described, caused by fear and delusions about dental treatment.[24] Parents' dental neglect and anxiety levels and their past dentist experiences may cause them to neglect their children's oral health and develop dental anxiety. For this purpose, the effects of parents' dental neglect and anxiety values on their children's dental neglect and anxiety values were evaluated. Additionally, the relationship between neglect, anxiety, the level of pain felt during the last dental treatment, and oral health was also examined.

In order to achieve and maintain oral health in children, their parents must be involved in oral health and dental care. Until the age of seven, it is the parents' responsibility to

be directly involved in the child's daily oral hygiene practices.[8] Any signs of dental neglect, especially in early childhood, are thought to be directly related to the parent. A study showed that parents' habit of visiting the dentist regularly will cause lower DNS in children.[25] Similarly, this study has shown a significant correlation between the parents' dental neglect values and their children's dental neglect values. Accordingly, it was determined that parents who did not pay due attention to their own oral hygiene did not pay due attention to their children's oral care and health.

Dental neglect begins in childhood and extends from adolescence to old age, being affected by various factors such as lifestyle and daily habits.[17,26] In a study conducted on this subject, dental neglect values in children were found to be 21.46. [16] In the present study, it was found that dental neglect values were much lower in children. It is thought that the variability between dental neglect values is related to the different sociocultural environments in which the studies are conducted and the frequency of dental visits and the formation of a conscious patient profile. In a study conducted on adults in Hong Kong, dental neglect values were found to be 14.81. [27] It was observed that the dental neglect values of the parents in the present study were close to the findings of the study done by McGrath et al.[27]. According to these values, it is seen that dental neglect is at similar rates even in different cultures and societies. According to the literature review, there are separate studies on dental neglect in adults and children. However, there is no study that evaluates the dental neglect levels of parents and their children together with their effects on oral health and anxiety values. In this regard, it is considered that the current study can contribute to the literature.

Dental anxiety is defined as the common fear and anxiety in children and adolescents that occur due to dental treatments that are affected by various environmental and social factors.[28,29] In a study conducted on a similar population on this subject, dental anxiety values were found to be 21.18. [16] It was observed that the dental anxiety values found in another study conducted on Nepali children including three different age groups were similar to the findings of the study conducted by Aydinoglu and Arslan[16].[30] In a study conducted in Romania, it was found that the dental anxiety values of 90.5% of the participants were 19 and above.[31] The current study found that dental anxiety values agreed with the findings of previous research evaluating dental anxiety in children. A total score of 19 or above on the MCDASf indicates the presence of dental anxiety.[31] These values can be considered an indicator of the presence of dental anxiety in the societies where the studies were conducted. The similarity between dental anxiety values obtained in the studies emphasizes that anxiety is a common problem that can be seen in every society and social environment.

Dental anxiety, which is common in children, may be a risk factor for tooth decay. Some studies have not found a relationship between caries and dental anxiety[16,32], but in a study conducted by Yahyaoglu et al.[33], it was determined that children with high anxiety values also had high DMFT values. Supporting this result, the current study also showed that children's dental anxiety levels increased as DMFT values increased. This situation is thought to be related to the deterioration of general oral health and the increase in the number of decayed teeth due to the tendency to avoid treatment due to anxiety. In patients with high dental anxiety, measures to reduce anxiety and relax patients can contribute to the protection of oral health.

It has been stated that bad dental experiences in the past increase anxiety.[34,35] Locker et al. [36] declared that the experience of a painful dental treatment was the most important determinant of dental anxiety. In a study done by Baygın et al.[37], it was stated that there was a positive relationship between the level of anxiety before the procedure and the degree of

pain felt during the procedure. In a relevant study, it was concluded that anxiety may arise due to negative experience or a feeling of uncertainty due to lack of information about the treatment to be performed, due to the correlation between anxiety and pain scores.[37] In this study, a positive relationship was observed between the pain levels and anxiety values felt by both children and their parents during the last treatment. Accordingly, it can be thought that past painful dental experiences negatively affect the anxiety values of individuals, both adults and children.

It is stated that there is a significant association between parents' dental anxiety and the development of dental anxiety in their children.[38] Nevertheless, Alwin et al.[39] reported that the relationship between child and parent anxiety was weak and that dental anxiety in the child did not originate from the parent. In this study, no direct relationship was found between parents' and their children's anxiety values. This may be due to the fact that dental anxiety is affected by many other factors such as age, gender and sociodemographic characteristics.

Dental anxiety is a risk factor that has negative effects on oral and dental health in many societies, starting in childhood and continuing into adulthood.[11] It has been stated that dental anxiety values are higher at younger ages.[35,40,41]In a study conducted by Folayan et al.,[42] it was reported that dental anxiety started to decrease as of 6-7 years of age, and the ability to cope with fears improved as age increased. In the present study, it was seen that dental anxiety decreased with increasing age. Children can learn to control their fears over time as they get older. This can help keep anxiety under control.

CONCLUSION

Conducting the study in a single center where socioeconomic and cultural diversity is limited limits the current study in terms of sample profile. Multicenter studies with a wide patient profile are needed on this subject. In addition, questioning the presence of pain after the last dental procedure may not always provide an objective answer in terms of pain assessment. This is among the limitations of the study. When the literature is examined, there are many studies on dental anxiety conducted separately in adults and children; however, there appears to be a limited number of studies evaluating the association between the anxiety values of children and their parents. Literature review shows that there are many studies on dental anxiety conducted separately in adults and children. As the first study to look at the connection between anxiety values of parents and their kids and dental neglect, it is anticipated that the current study will add to the body of literature.

Ethical Approval

The ethics committee approval for the study was obtained from Recep Tayyip Erdogan University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee (Decision no: 2019/171).

Financial Support

No financial support was received from any institution or organization for this study.

Conflict of Interest

The authors deny any conflicts of interest related to this study.

Author Contributions

Study design: SA; Data collecting: BSB, MY; Data entry: SA, İA; Data analysis and interpretation: SA, İA, NBK; Literature review: BSB, MY; manuscript writing: SA, İA, BSB, MY.

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