folia medica

Folia Medica 61(3): 444-50
DOI: 10.3897/folmed.61.e39353

Original Article

Dental Fear of 6-12-year-old Children - Role of Parents, Gender and Age

Maria P. Shindova[1], Ani B. Belcheva[1], Jeny G. Raycheva[2]

[1] *Department of Pediatric Dentistry, Faculty of Dental Medicine, Medical University of Plovdiv, Plovdiv, Bulgaria*
[2] *Student in Faculty of Dental Medicine, Medical University of Plovdiv, Plovdiv, Bulgaria*

Corresponding author: Maria P. Shindova, Department of Pediatric Dentistry, Faculty of Dental Medicine, Medical University of Plovdiv, 3 Hristo Botev Blvd., 4000 Plovdiv, Bulgaria; E-mail: mariya.shindova@gmail.com ; Tel:

Received: 06 Dec 2018 ♦ **Accepted:** 10 Mar 2019 ♦ **Published:** 30 Sep 2019

Citation: Shindova MP, Belcheva AB, Raycheva JG. Dental fear of 6-12-year-old children – role of parents, gender and age. Folia Med (Plovdiv) 2019;61(3):444-50. doi: 10.3897/folmed.61.e39353

Aim: To investigate the level of dental fear in middle childhood and the impact of various personal and social factors that contribute to developing dental fear.

Materials and methods: The study included sixty-seven 6-12-year-old children and their parents, randomly selected while receiving their treatment at the Department of Pediatric Dentistry, Plovdiv. A modified version of Dental Subscale of the Children's Fear Survey Schedule (CFSS-DS) was used to assess the dental fear of each patient. An interview was conducted with the parents to gather information about patient's gender and age, parent's dental anxiety (Corah's dental anxiety scale-DAS) and pre-appointment preparation of children.

Results: The results show that the mean of CFSS-DS for children is 30.28±1.17. Concerning the age and gender the comparison between groups of patients with different levels of dental fear demonstrate no significant difference ($p>0.05$). 60.6%±0.49 of parents prepare their children themselves for the future dental visit and 39.4%±0.49 rely on the dentists to do it. The analysis shows that parent's dental anxiety and pre-appointment preparation are not associated with the level of dental fear of their children ($p>0.05$).

Conclusions: In middle childhood the majority of children show no or low level of dental fear. The personal and social factors we studied are not determinant risk factors for 6-12-year-old children to develop dental fear.

Key words:

dental fear, parent, gender, age, children

INTRODUCTION

Dental fear is a normal emotional reaction to one or more specific threatening stimuli in the dental situation.[1,2] The multifactorial etiology of children's dental fear identifies the influence of many different risk factors in its development.[3] Although there is a range of factors that are associated with dental fear, they can be grouped into several general categories – personal factors such as age, gender, general fear, temperament, and intellect, social factors including parental dental anxiety, family social-economic status, pre-appointment preparation by parents and their expectations for children's behaviour in dental environment, and factors associated with the dental environment such as dental visit, treatment, and environment.[4] Most of the studies in the contemporary scientific literature investigating the relationship between individual covariates and dental fear in children focus mainly on the impact of gender and age.[5-8] A review of the scientific literature in behavioural pediatric dentistry shows considerable evidence that dental fear decreases with age, there are also a few studies not showing

changes in fear with age and even some studies showing an increase in dental fear with age.[4,9] Most studies investigating gender differences show that girls report higher anxiety compared to boys.[5,8,10,11] Interestingly, in countries with different cultural modulation, no statistical relationship between gender and dental anxiety has been reported.[6,7,12-14] The social factor 'parent' is becoming increasingly important to the cognitive development and psychological growth throughout middle childhood.[1] The relationship between parental and child dental fear has been well researched. A meta-analysis that included 43 studies confirmed the association between parental and child dental fear and reported that the relationship is most evident in children aged eight years and under.[4,15-17] However, Paryab et al. found no statistically significant difference between parental and children's dental anxiety.[6] Regarding the pre-appointment preparation the American Academy of Pediatric Dentistry supposes that parents play a positive role when introducing dental environment to children.[18] A research from 2013 showed an increase of child's dental anxiety when patients were prepared for the future dental visit by their parents in advance.[19] There is a debate on the effect of the individual and social factors on children's dental fear. The review of the studies in this research area conducted in children of different ages reported conflicting results.[5-8]

AIM

The aim of the study was to investigate the level of dental fear and the role of the personal factors – age and gender, and social factors - parental dental anxiety and pre-appointment child's preparation, for the development of dental fear of 6-12-year-old children.

MATERIALS AND METHODS

The study was conducted among 134 participants – sixty-seven 6-12-year-old children and equal number of their parents, randomly selected during their treatment visit at the Department of Pediatric Dentistry, between May 2013 and May 2015. The inclusion criteria for children were as follows:

- children aged 6-12 years;
- first time visitors;
- reason of dental visit – regular dental examination;
- signed informed consent form from parents for participation in the study;
- native language of the child – Bulgarian;

The inclusion criteria for parents were

- the accompanying person of the child to be his/her parent or guardian;
- native language – Bulgarian;
- comprehension and answer to all questions asked by the dentist and included in the questionnaire.

The exclusion criteria for the study:

- participants with systemic diseases and mental disorders.

The study was approved by the Ethics Committee of the University Clinic where the research took place (No. P-1371/29.05.2015).

In the waiting room, the parent was asked to complete a two-section questionnaire. The first section of the questionnaire gathered information about the gender, age and pre-appointment preparation of children (parents answer the question "Do you prepare your child for the dental visit by explaining the details of the treatment and the emotions they will feel?"). The second section of the questionnaire investigated the parental dental anxiety using the Coral dental anxiety scale (DAS).[20,21] A five-point scale ranging from 1 'not anxious' to 5 'extremely anxious' was used to rate the level of parent's dental anxiety for each item, so the range of possible scores was 4–20. The cutoff point of more than 13 indicated high anxiety level or possibly phobic.[20] According to the total result, parents were grouped into three degrees of dental anxiety.[22-24]:

- no or low dental anxiety – 0–8 points;
- moderate dental anxiety – 9–12 points;
- severe dental anxiety – 13–20 points.

The dental fear of children was assessed using the modified version of the Children's Fear Survey Schedule-Dental Subscale (CFSS-DS).[21,25] The questionnaire consists of 15 items, related to different aspects of dental situation and treatment. The pictorial version of CFSS-DS is developed by the addition of a facial image analogue scale anchored above the original numeric form that correspond to the 5-point Likert scale (**Fig. 1**). In the dental office each child was asked to point to the face or choose the number which most closely depicted its fear for each item. The total possible score ranged from 15 to 75.

The obtained data were tabulated and processed statistically using SPSS version 19.0. The level of statistical significance was set at $p<0.05$. Independent sample t-test, paired t-test, nonparametric One-way ANOVA, chi-squared test and correlation were applied for data analysis.

RESULTS

The mean age of the sample is 7.87±1.80 with 37 girls (55.2%) and 30 boys (44.8%). The results of our study demonstrated that the mean of CFSS-DS for children is 30.28±1.17. The majority of the investigated children reported no or low level of dental fear (CFSS-DS<32).[26,27] The girls showed the mean and standard deviation of CFSS-DS 31.41±9.54, while the boys showed the mean and standard deviation of CFSS-DS to be 28.90±9.63 (**Fig. 2**). Our research shows that girls are more likely to report higher dental fear but the differences are not statistically significant ($p>0.05$).

When presenting and interpreting the influence of the

Folia Medica

Question No	How afraid are you of					
1	dentists	1	2	3	4	5
2	doctors	1	2	3	4	5
3	injections	1	2	3	4	5
4	having somebody examining your mouth	1	2	3	4	5
5	having to open your mouth	1	2	3	4	5
6	having a stranger touch you	1	2	3	4	5
7	having somebody look at you	1	2	3	4	5
8	the dentist drilling	1	2	3	4	5
9	the sight of the dentist drilling	1	2	3	4	5
10	the noise of the dental drilling	1	2	3	4	5
11	having put instruments in mouth	1	2	3	4	5
12	choking	1	2	3	4	5
13	having to go to the hospital	1	2	3	4	5
14	people in white uniform	1	2	3	4	5
15	having the dentist clean your teeth	1	2	3	4	5

Figure 1. Facial image scale of the dental subscale of the Children's Fear Survey Schedule.

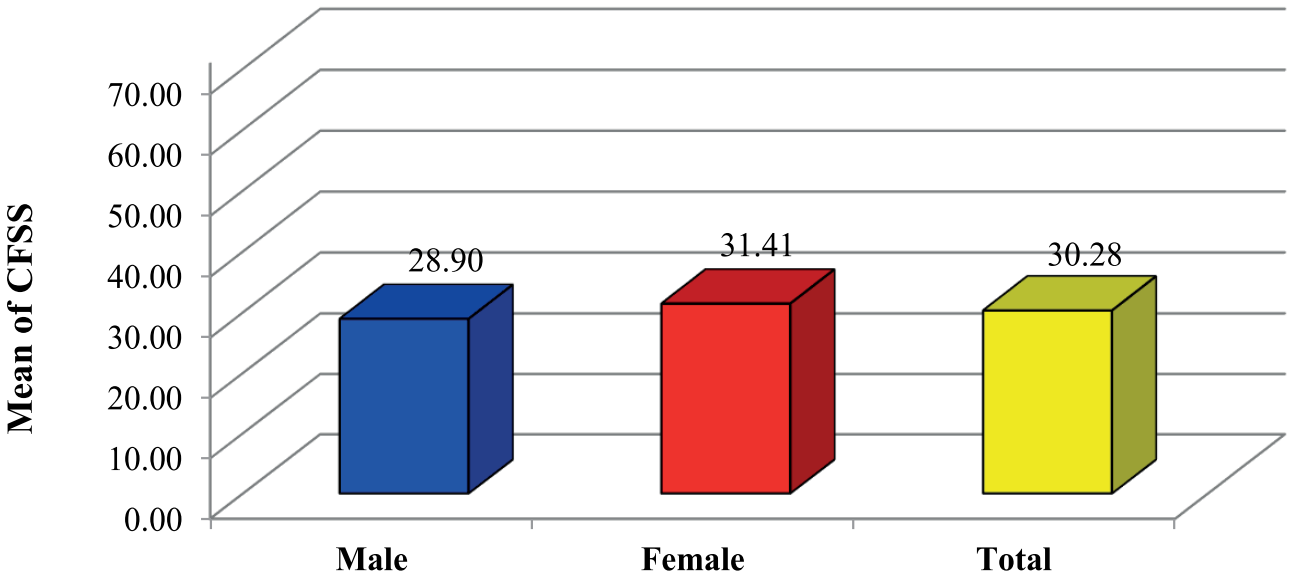

Figure 2. Mean value of CFSS-DS according to gender.

investigated risk factors, children were divided into two categories according to the total result of CFSS-DS: children with no or low dental fear (CFSS-DS < 32) and children with moderate and high dental fear (CFSS-DS ≥ 32). **Table 1** shows the distribution of the children with no or low dental fear and children with moderate and high dental fear according to the explored personal and social factors.

When exploring the effect of age on dental fear, the investigated patients were divided into two age groups - 6-9 years and 10-12 years. A statistical analysis was performed to test the difference in fear scores between them. It demonstrated that there is no significant difference in self-reported fear levels in the two age groups (p>0.05).

Concerning the gender differences, in the group of children with moderate and high dental fear the girls were 61.3%±0.50 and the boys - 38.7%±0.50. Female participants reported higher levels of dental fear than male participants. However, the differences could not reach statistical significance (p>0.05).

Regarding the social risk factor 'parent', two variables are studied: parental dental anxiety and pre-appointment preparation of children. The study is conducted among 134 participants (N = 134) – 67 children and equal number of their parents. **Figure 3** shows the distribution of parents according to their level of dental anxiety. The results of our study showed that 47 parents reported no or low degree of dental anxiety (70.1%), 17 of them reported moderate anxiety (25.4%) and only 3 parents had severe anxiety (4.5%). When studying the relationship parental anxiety-child's fear, we grouped the three levels of dental anxiety on the Corah's dental anxiety scale into two degrees of anxiety – non-anxious parents (level 1, 70.1%) and anxious ones (level 2 and 3, 29.9%).

Pearson coefficient demonstrated that no association exists between parental dental anxiety and children's dental fear (p>0.05). The findings are confirmed by another applied statistical analysis independent t-test that compares the mean values CFSS-DS between the two groups of parents. Children of the non-anxious parents report CFSS-DS of 30.11±9.56 that is approximately equal to the answers of the children of the anxious parents: CFSS-DS of 30.70±9.92 (p>0.05). The analysis shows that there is no significant association between child's dental fear and parent's dental anxiety. Our results regarding the pre-appointment preparation of children show that 60.6%±0.49 of parents prepares their children for a future dental visit and 39.4%±0.49 rely on the dentists to do it. The analysis indicates no significant difference in the levels of dental fear between the two groups of children according to their pre-appointment preparation at home (p>0.05). The analysis of the results of the present research shows that the investigated personal factors – age and gender, and social factors - parental dental anxiety and pre-appointment child's preparation, are not associated with the level of dental fear of 6-12-year-old children (p>0.05).

Table 1. Personal and social risk factors associated with dental fear (N - number of patients)

		CFSS-DS<32		CFSS-DS≥32				
	Factors	N	%	N	%	OR	95% ID	p
				1. Age groups				
Personal	6 – 9 years	33	86.8%	25	80.6%	1.584	0.434–5.878	0.484
	10 – 12 years	2	13.2%	6	19.4%			
				2. Gender				
	Male	19	50%	12	38.7%	1.583	0.605–4.146	0.348
	Female	19	50%	19	61.3%			
				3. Parental dental anxiety				
Social	No or low anxiety	26	70.3%	21	70%	1.013	0.354–2.901	0.981
	Moderate and severe anxiety	11	29.7%	9	30%			
				4. Pre-appointment preparation				
	Yes	21	60.0%	19	61.3%	3.044	1.073–8.633	0.915
	No	14	40.0%	12	38.7%			

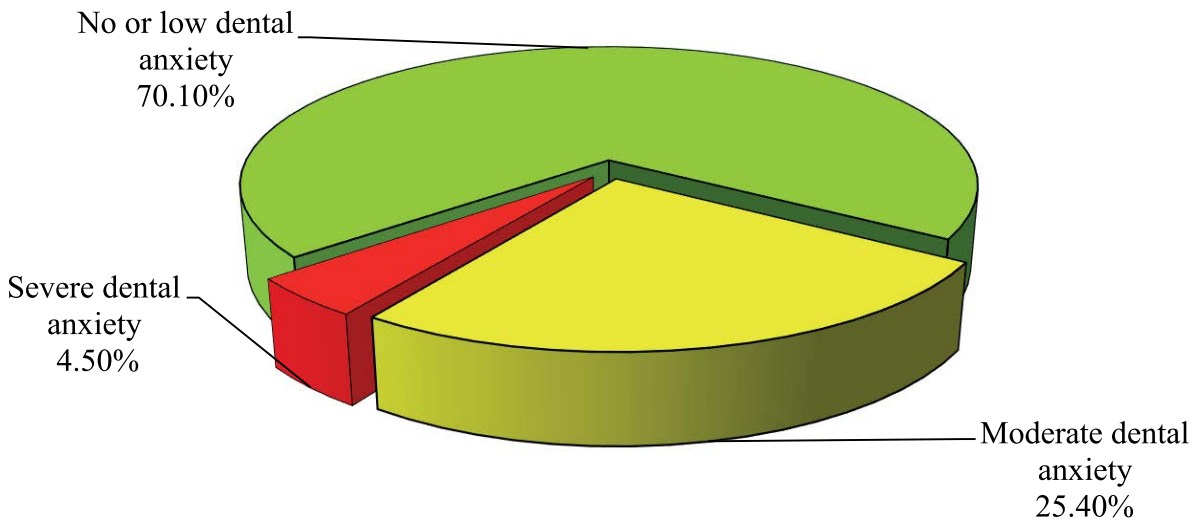

Figure 3. Distribution of the parents according to their level of dental anxiety.

DISCUSSION

The CFSS-DS scores in our study are consistent with the data reported by previous studies in Singapore, Canada and Japan.[12,28] Their authors find statistical difference in fear levels between boys and girls and show that female participants' score on CFSS-DS is higher compared to that of male ones.[12] The results of the present study concerning the impact of gender on children's fear are in line with the results obtained by Raj et al. to the effect that there is no significant difference between male and female dental fear levels.[26] According to Church and Stone, emotions associated with sexual maturation become manifest after the age of 12 that is considered to be the possible reason for discussed results.[13] There is a debate on age as a risk factor in the development of dental fear. Some authors found that with the increase in the age, fear score would be reduced.[5] Other researchers published that dental fear level increases significantly with age of the patient.[8] Several studies report no association between the degree of dental fear and age.[5] Our results show that there is no statistically significant difference between the levels of dental fear and anxiety in terms of age groups.

Although most studies suggest that there is higher fear scores in girls as compared to boys, some studies show no association between sexes in relation to dental anxiety.[5,8] No significant difference in levels of dental fear related to gender has been found in our study. The results of the present study confirm the results obtained in a number of previous similar studies investigating the middle childhood period. Paryab et al. and Folayan et al., who investigated the relationship between gender and dental fear in children between the ages of 6 and 12, determine the same trend.[6,12,13] Concerning the general dental fear the comparison between groups of girls and boys also demonstrate no significant difference ($p>0.05$). The data obtained in our study suggest that the investigated personal factors – age and gender, are not determinant risk factors for the development of dental fear and anxiety in 6-12-year-old children.

There are numerous studies investigating the relationship between child and parental dental fear and anxiety.[4,16] A detailed analysis of 45 articles that research the association 'parental anxiety-child fear in dental environment', shows that this relationship is observed only in the first 8 years of life.[28] The results of our study as well as the age of the investigated patients demonstrate that parent's dental anxiety is not associated with the level of dental fear of their children in the period of the middle childhood. The present results are in line with the results obtained by Paryab et al. that found a lack of parental anxiety influence on children's dental fear.[6] The research included a group of 150 Iranian children aged 6-12 years and their mothers.

The interpretation of data obtained in our study includes the inappropriate manner of parents' pre-appointment preparation as well as the patients' age which is a time of important developmental advances that establish children's sense of identity, self-esteem and individuality.[29] However, our results are different from the results obtained by the study by Ramos-Jorge that showed an increase of child's dental anxiety when patients have been prepared for the future dental visit by their parents in advance.[19] The authors explained the data with the inappropriate manner of parents' pre-appointment preparation, parental dental anxiety as well as the previous negative experience of children in the dental office. Only few studies have investigated the effect of parents' preparation for future dental visit of their children. Thus, further studies are necessary to research

this problem and propose a structure of appropriate manner for children's preparation according to their age and individual characteristics.

CONCLUSIONS

In middle childhood the majority of children show no or low level of dental fear. The investigated personal (age and gender) and social factors (role of parents) are not determinant risk factors for development of dental fear in 6-12-year-old children. This could be due to the social, emotional and cognitive changes during the period of middle childhood that transform children's minds and result in increasing their self-control and responsibility.

REFERENCES

1. Porritt J, Marshman Z, Rodd HD. Understanding children's dental anxiety and psychological approaches to its reduction. Int J Paediatr Dent 2012; 22(6): 397-405.
2. Guinot JF, Yuste BS, Cuadros FC, et al. Objective and subjective measures for assessing anxiety in paediatric dental patients. Eur J Paediatr Dent 2011; 12(4): 239-44.
3. Broeren S, Muris P. The relation between cognitive development and anxiety phenomena in children. J Child Fam Stud 2009; 18(6): 702-9.
4. Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. Int J Paediatr Dent 2007; 17(6): 391-406.
5. Klaassen MA. Child dental fear and quality of life [dissertation]. Amsterdam: University of Amsterdam; 2010.
6. Paryab M, Hosseinbor M. Dental anxiety and behavioral problems: A study of prevalence and related factors among a group of Iranian children aged 6-12. J Indian Soc Pedod Prev Dent 2013; 31: 82-6.
7. Rãducanu AM, Feraru V, Herteliu C, et al. Assessment of the prevalence of dental fear and its causes among children and adolescents attending a department of pediatric dentistry in Bucharest. OHDMBSC 2009; 8(1): 42-9.
8. Tickle M, Jones C, Buchannan K, et al. A prospective study of dental anxiety in a cohort of children followed from 5 to 9 years of age. Int J Paediatr Dent 2009; 19(4): 225-32.
9. Winer GA. A review and analysis of children's fearful behavior in dental settings. Child Dev 1982; 53: 1111-33.
10. Peretz B, Efrat J. Dental anxiety among young adolescent patients in Israel. Int J Paediatr Dent 2000; 10: 126-32.
11. Raciene R. Prevalence of dental fear among Vilnius pupils aged 12 to 15 years. Determining factors. Stomatologija. Baltic Dent Maxillofac J 2003; 5: 52-6.
12. Krikken JB, van Wijk AJ, ten Cate JM, et al. Measuring dental fear using the CFSS-DS. Do children and parents agree? Int J Paediatr Dent 2013; 23(2): 94-100.
13. Folayan MO, Idehen EE, Ufomata D. The effect of sociodemographic factors on dental anxiety in children seen in a suburban Nigerian hospital. Int J Paediatr Dent 2003; 13: 20-6.
14. Buchanan H, Niven N. Further evidence for the validity of the Facial Image Scale. Int J Paediatr Dent 2003; 13(5): 368-9.
15. Hollis AL. Dental anxiety amongst paediatric cardiology patients [dissertation]. Leeds: University of Leeds; 2012.
16. ten Berge M, Veerkamp JS, Hoogstraten J, et al.Childhood dental fear in the Netherlands: prevalence and normative data. Community Dent Oral Epidemiol 2002; 30(2): 101-7.
17. Themessl-Huber M, Freeman R, Humphris G, et al. Empirical evidence of the relationship between parental and child dental fear: a structured review and meta-analysis. Int J Paediatr Dent 2010; 20(2): 83-101.
18. American Academy of Pediatric Dentistry. Guideline on Behavior Guidance for the Pediatric Dental Patient. Pediatr Dent 2011; 34(6); 171-82.
19. Ramos-Jorge J, Marques LS, Homem MA, et al. Degree of dental anxiety in children with and without toothache: prospective assessment. Int J Paediatr Dent 2013; 23(2): 125-30.
20. Corah NL. Development of a dental anxiety scale. J Dent Res 1969; 48(4): 596.
21. Ilieva E. [The child as a dental patient.] Sofia; 2000 (Bulgarian).
22. Buchanan H. Development of a computerised dental anxiety scale for children: validation and reliability. Br Dent J 2005; 199(6): 359-62.
23. Carrillo-Diaz M, Crego A, Romero-Maroto M. The influence of gender on the relationship between dental anxiety and oral health-related emotional well-being. Int J Paediatr Dent 2013; 23(3): 180-7.
24. Murray P, Liddell A, Donohue J. A longitudinal study of the contribution of dental experience to dental anxiety in children between 9 and 12 years of age. J Behav Med 1989; 12(3): 309-20.
25. Shindova MP, Belcheva A, Mateva ND. Factors in dental environment related to development of child dental fear and parent-child agreement on its evaluation. Int J Sci & Tech 2014; 4: 91-5.
26. Raj S, Agarwal M, Aradhya K, et al. Evaluation of dental fear in children during dental visit using children's fear survey schedule-dental subscale. Int J Clin Pediatr D 2013; 6(1): 12-5.
27. Majstorovic M, Veerkamp JS, Skrinjaric I. Reliability and validity of measures used in assessing dental anxiety in 5- to 15-year-old Croatian children. Eur J Paediatr Dent 2003; 4(4): 197-202.
28. ten Berge M, Veerkamp JS, Hoogstraten J, et al. Parental beliefs on the origins of child dental fear in The Netherlands. ASDC J Dent Child. 2001; 68(1): 51-4, 12.
29. Eccles JS. The development of children ages 6 to 14. Future Child 1999; 9(2): 30-44.

Дентофобия у детей от 6 до 12 лет - роль родителей, пола и возраста

Мария П. Шиндова[1], Ани Б. Белчева[1], Жени Г. Райчева[2]

[1]Кафедра детской дентальной медицины, Факультет дентальной медицины, Медицинский университет - Пловдив , Пловдив, Болгария
[2]Студент Факультета дентальной медицины, Медицинский университет - Пловдив , Пловдив, Болгария

Адрес для корреспонденции: Мария П. Шиндова, Кафедра детской дентальной медицины, Факультет дентальной медицины, Медицинский университет - Пловдив, бул. „Христо Ботев" № 3, 4000 Пловдив, България;

E-mail: mariya.shindova@gmail.com

Дата получения: 06 декабря 2018
Дата приемки: 10 марта 2019
Дата публикации: 30 сентября 2019

Ключевые слова: дентофобия, родители, пол, возраст, дети

Образец цитирования: Shindova MP, Belcheva AB, Raycheva JG. Dental fear of 6-12-year-old children – role of parents, gender and age. Folia Med (Plovdiv) 2019;61(3):444-50. doi: 10.3897/folmed.61.e39353

Цель: Исследовать уровень дентофобии в середине детства и влияние различных личностных и социальных факторов, способствующих развитию дентофобии.

Материалы и методы: В исследование были включены шестьдесят семь детей в возрасте от 6 до 12 лет и их родители, которые были выбраны случайным образом во время лечения на кафедре детской дентальной медицины, Пловдив. Для оценки дентофобии каждого пациента использовалась модифицированная версия дентальной субшкалы (Children's Fear Survey Schedule (CFSS-DS). С родителями была проведена анкета для сбора информации о поле и возрасте пациентов, а также о стоматологической тревоге родителей (шкала стоматологической тревоги Corah - DAS) и подготовке детей перед визитом к стоматологу.

Результаты: Результаты показали, что среднее значение CFSS-DS для детей составляло 30,28 ± 1,17. Не существует статистически значимой разницы в сравнении возраста и пола между группами пациентов с различным уровнем дентофобии. 60,6% ± 0,49 родителей самостоятельно готовят своих детей к будущему визиту к стоматологу, а 39,4% ± 0,49 полагаются на то, что стоматолог сделает это сам. Анализ показывает, что стоматологическая тревога и подготовка родителей перед визитом к стоматологу не связаны с уровнем дентофобии их детей (p> 0,05).

Выводы: В младших классах средней школы у большинства детей установлен низкий уровень или отсутствие дентофобии. Личные и социальные факторы, которые мы изучили, не являются определяющими факторами риска для детей в возрасте 6-12 лет, вызывающими дентофобию.