Effect of Health Behaviors Education on Oral Health Improvement in Anxious Children in Sanandaj, 2018; a Pilot Study

Original Article

Abstract

Background: This study investigated the effect of education on the shaping of oral health behaviors in children with high anxiety identified based on Spence Anxiety Scale.

Materials and methods: This was a descriptive-analytic study which was carried out on eighty children between 8 and 15 years old living in Welfare Organization affiliated centers in Sanandaj in 2018. Sampling was done by convenience method. Children's anxiety was assessed using Spence-Childhood Anxiety Scale. Fifty two children with high anxiety level were identified and they were randomly assigned to control and experimental groups. Plaque index was measured in all anxious children both at the beginning of the study and one month after the intervention. Data were analyzed by SPSS software version 21.

Results: The results showed that anxiety mean level in the experimental group was higher than that in the control one ($p < 0.05$). The mean score of index plaque in the control group did not differ significantly from the experimental group before the intervention ($p < 0.05$), but it was significantly higher in the control group after the intervention ($p < 0.05$).

Conclusion: Health behavior training was effective on improving plaque index in short term, and general anxiety in children was not a barrier to accepting, shaping and modifying oral health behaviors.

Keywords: Anxiety, Education, Oral health, Dental Plaque Index.

Soleimanzade R [1]
Amjadian M [2*]
Maleki Sh[3]

1. Assistant professor Department of pediatric dentistry,Faculty of dentistry, Kurdistan university of medical sciences, Sanandaj, Iran

2. Assistant professor Department of Clinical Psychology, School of Medicine, Kurdistan University of Medical Sciences, Sanandaj, Iran

3. Dentist

Corresponding Author:
Soleymanzade.R@gmail.com

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

بررسی تأثیر آموزش رفتارهای بهداشتی بر بهبود بهداشت دهان و دندان در کودکان مضطرب شهر سنندج در سال ۱۳۹۷، یک مطالعه آزمایشی

تحقیقی

چکیده

زمینه و هدف: هدف از این مطالعه، بررسی تأثیر آموزش بر شکل گیری رفتارهای مراقبتی دهان و دندان در کودکانی بود که بر اساس مقیاس سنجش اضطراب اسپنس در دسته ی کودکان با اضطراب بالا طبقه بندی می شوند.

مواد و روش ها: این مطالعه ی تحلیلی-توصیفی در سال ۱۳۹۷ با نمونه گیری به روش سرشماری در هشتاد کودک هشت تا پانزده ساله که در مراکز وابسته به سازمان بهزیستی شهرستان سنندج نگهداری می شدند، انجام شد. اضطراب کودکان با استفاده از مقیاس سنجش اضطراب اسپنس-نسخه کودکان، ارزیابی شد. پنجاه و دو کودک با سطح اضطراب بالا شناسایی شدند و به صورت تصادفی در دو گروه کنترل و مداخله ی آموزشی قرار گرفتند. شاخص پلاک ایندکس در همه ی کودکان مضطرب یکبار در شروع مطالعه و بار دوم یک ماه بعد ازآموزش گروه مداخله، ارزیابی شد. داده-ها با استفاده از نرم افزار آماری SPSS نسخه ۲۱ مورد تجزیه و تحلیل قرار گرفت.

یافته ها: براساس نتایج به دست آمده، میانگین سطح اضطراب در گروه مداخله بیشتر از گروه کنترل بود($p<0.05$). میانگین پلاک ایندکس قبل از مداخله در گروه کنترل تفاوت معنی داری با گروه مداخله نداشت ($p<0.05$). میانگین پلاک ایندکس بعد از مداخله در گروه کنترل به میزان قابل ملاحظه-ای بیشتر از گروه مداخله بود ($p<0.05$).

نتیجه گیری: آموزش رفتارهای بهداشتی در بهبود شاخص پلاک ایندکس در کوتاه مدت مؤثر است و اضطراب عمومی در کودکان به عنوان مانعی برای پذیرش رفتارهای بهداشتی دهان و دندان و شکل گیری و اصلاح این رفتارها شناخته نشد.

کلمات کلیدی: آموزش، بهداشت دهان و دندان، شاخص پلاک دندانی، اضطراب

روژین سلیمان زاده[1]*
محی الدین امجدیان[2]
شبنم ملکی[3]

۱. استادیار دانشکده دندانپزشکی، دانشگاه علوم پزشکی کردستان، سنندج، ایران

۲. استادیار دانشکده پزشکی دانشگاه علوم پزشکی کردستان، سنندج، ایران

۳. دندانپزشک

نویسنده مسئول: دکتر محی الدین امجدیان
Soleymanzade.R@gmail.com

تاریخ دریافت: ۹۷/۶/۱۹
تاریخ پذیرش: ۹۸/۲/۲۳

Introduction: Anxiety was defined as chronic and excessive worry and fear that seemed to have no real cause and could lead to cognitive, emotional, physical and behavioral symptoms (1). According to the results of a systematic review in Iran; the prevalence of anxiety disorders among Iranian children and adolescents was remarkable and relatively high. Anxiety disorders had a negative effect on the person and his or her performance and behaviors and it could lead to more severe problems (2). Anxiety disorders with an incidence of 5 to 17 percent were one of the most common psychiatric disorders in childhood and they were often experienced in children of school age. This disorder was stable over time and affected other aspects of the life of the

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

affected person, including poor academic performance, low self-esteem, depression and substance dependency (3). It seemed that general anxiety could also affect the quality of oral and dental health by affecting different aspects of a person's life. A little amount of anxiety prepared the individual to use all his resources against a potential threat, while high anxiety levels reduced and / or disrupted mental and cognitive abilities such as attention, concentration, and memory (4). Oral health education was one of the preventive methods for oral and dental diseases, which plays an important role in preventing oral diseases in children (5) However, anxiety played an important role in learning these preventive methods and it could lead to a greater risk of errors in learning, so as it could be one of the most important barriers to learning these methods (6). Since children were the most important human resource in every society, and they also had a special role in transferring the health concepts and promoting general health (7) anxiety disorders should be paid attention more by the health practitioners and they should take the necessary steps to identify and diagnose this disorder in children much earlier. Okoro et al. studied the relationship between anxiety and depression with using oral health services and tooth loss. The results of this study showed that there was a significant relationship between these disorders and using oral health services, and the adults with these disorders were more likely to have tooth loss due to dental caries or gum diseases. Moreover, they showed that many signs of depression could have a negative impact on adult oral health behaviors. These effects could be due to lack of motivation, feeling of worthlessness and fatigue (8). Learning the principles of oral and dental health from an early age is very critical for promoting community's oral health in future. Identifying the barriers to the shaping of desirable health behaviors in children is one of the main concerns of oral health education practitioners. Due to the negative role of anxiety in learning processes in general and in shaping the desirable health behaviors, this study investigated the educability of oral health behaviors in children identified with high anxiety based on Spence Anxiety Scale.

Materials and methods: The study sample included 8-15 year children with malfunctioning parents or without any parents who were generally healthy and lived in welfare organization centers in Sanandaj in 2018. The sampling was done using convenience sampling method and 80 children were included in the study. Out of

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

them, 52 children were identified as children with high anxiety and entered into the study. Spence children's anxiety scale was used to identify anxious children. This scale contained 44 items. 38 items showed an anxiety disorder and 6 items were designed to prevent any bias in the scale. The responses of the items included never, sometimes, often or always, and the score for each item was from 0 to 3 based on a four- point Likert Scale. The interpretation of the results was based on the overall score and varied according to the age and gender of the respondent. The respondent could be the child himself or his/her caregiver. If Child-reported SCAS was given, the overall score of more than 40 and 50 (including fifty and forty) were classified as high levels of anxiety for boys and girls of 8-11 years old respectively. For children of 12-15 years old, the overall score of 33 and above and 39 and above were classified as high anxiety for boys and girls respectively. If the scale was answered by one parent or caregiver (SCAS), the overall score of 31.4 or above and 33 and above suggested an anxiety disorder for boys and girls of 11-6 years old respectively. Moreover, the overall score of 30.1 and above and 32.2 and above suggested anxiety disorder for boys and girls of 12-18 years old respectively. In addition, the overall score of 34 and above was categorized as high anxiety level for the preschool age in this scale.9,10 Moreover, the reliability of this scale for general anxiety was reported to be 0.92 and 0.60 to 0.82 for its subscales.11 In Mousavi et al. (2007), the reliability of this scale was reported to be 0.62 to 0.89 using Cronbach's alpha (8). Fifty two children were identified with moderate to severe anxiety and entered into the study based on the Spence Anxiety Scale for Children. The children were randomly divided into experimental and control groups. DMFT plaque indexes were evaluated before and after the intervention in both groups by the dentist, and the results were recorded in each child's form. In fact, the children were examined in a room with enough light using a desk and two opposite chairs for the dentist and the children. A disposable mirror and probe was used for examination. DMFT for each child was the total number of permanent decayed, filled or extracted teeth, and its numerical value was recorded for each child. The O'Leary method was used to determine the plaque index.12 first, a plaque detector tablet was given to the children. After washing the mouth, they were examined each surface- colored tooth for any soft accumulations in the dental-gum joint using an explorer. The colored surfaces that were soft were marked on the dental chart.

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

Levels that did not have a soft accumulation in dental-gum joint were not recorded. After examining all teeth, the dental chart was completed and the index plaque of each child was calculated by dividing the number of plaque surfaces by the total number of available dental surfaces. Then oral health education including proper brushing, dental floss and tips for healthy nursing patterns were given to the children in the experimental group in a thirty minute face to face education session. However, the control group did not receive any training. One month later, the children's index plaque was re-evaluated in both groups and the results were recorded. SPSS software version 21 was used to analyze the data. Mean, standard deviation and chi-square test were used to analyze the results. The significance level was considered to be P <0.05.

Results: The results were analyzed in two descriptive and analytical sections including mean, standard deviation and investigating any relationships between the studied variables. Table 1 showed that the mean age in the control group was more than that in the experimental group, but this difference was not statistically significant (p> 0.05). Table 2 showed that the number of girls and boys in both groups were the same, so there was no significant difference between the two groups (p> 0.05).

Comparison of anxiety level in the two groups: Table 3 showed that the average level of anxiety in the experimental group was higher than that of the control group, and this difference was statistically significant (p <0.05).

Comparison of index plaque before intervention in the two groups: Table 4 showed that the mean of the plaque index before the intervention in the control group was higher than that in the experimental group, but this difference was not statistically significant (p <0.05).

Comparison of plaque index after intervention in the two groups: Table 5 showed that the mean of plaque index after the intervention in the control group was significantly higher than that in the experimental group (p <0.05).

Comparison of DMFT index in both control and experimental groups: Table 6 showed that the mean DMFT index in the intervention group was higher than that in the control group, but this difference was not statistically significant (p> 0.05).

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

Table 1: Mann-Whitney test results to compare the age of the children in the control and experimental groups.

Variable	Group	Mean	S.D	P-Value
Age	Control	13.38	2.43	0.050
	Experimental	12.96	1.58	

Table 2: Chi-square test for gender comparison in both groups

Variable		Groups			P-value
		Control Frequency/ Percentage	Experimental Frequency/ Percentage	Total Frequency/ Percentage	
Gender	Boy	9 (34.62%)	9 (34.62%)	18 (34.62%)	0.0001
	Girl	17 (65.38%)	17 (65.38%)	34 (65.38%)	
	Total	26 (100%)	26 (100%)	52 (100%)	

Table 3: Mann-Whitney test for comparing anxiety level in the two groups

Variable	Groups	Mean	SD	P-value
Anxiety	Control	63.34	29.41	0.001
	Experimental	71.19	12.25	

Table 4: Mann-Whitney test results to compare plaque Index before intervention in the two groups

Variable	Groups	Mean	SD	P-value
Plaque index	Control	33.26	6.56	0.349
	Experimental	30.26	8.77	

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

Table 5: Mann-Whitney test results to compare plaque Index after intervention in the two groups

Variable	Groups	Mean	SD	P-value
Plaque index	Control	34.46	8.95	0.001
	Experimental	22.96	4.11	

Table 6: Mann-Whitney test results to compare DMFT index in the two groups.

Variable	Groups	Mean	SD	P-value
DMFT index	Control	4.73	2.63	0.774
	Experimental	4.96	2.48	

Discussion: The results of this study showed that the education of oral health in anxious children could be effective in improving their oral and dental health, and psychosocial factors such as anxiety did not act as a barrier to the education and promoting oral hygiene. Okoro et al., while controlling many confounding factors in their study, showed that there was a correlation between anxiety and depression with using oral health services and loss of teeth. People with anxiety and depression used oral health care services the least during the last year in the study (10). The results of this study showed that 52 anxious students between 8-15 years old including 18 boys (34/62%) and 34 girls (65/38%) were randomly divided equally into two experimental and control groups. The mean age in the control group (13.38 ± 2.43 years) was higher than the experimental one (12.96 ± 1.8 years). Moreover, the mean and standard deviation of pre-test and post-test plaque index in the control group were 33.26 ± 6.6 and 34.46 ± 8.95 respectively. Also, the mean and standard deviation of pre-test and post-test plaque index in the experimental group were 30.26 ± 8.77 and 22.96 ± 11.4 respectively. This showed that the plaque index was significantly reduced in the experimental group in the post-test, while it was increased slightly in the control group at the same time. It should be noted that this difference was not significant before the training program in

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

both control and experimental groups. These findings were in line with the results of Afshar et al. (1395), Hindi et al (1394), D'Cruz and Aradhya (2013), Babaei, Cardan and Bayat (2011) and Verbani et al. (2005) (13-17). In fact, oral health education could significantly reduce plaque index in these studies. Habbu and Krishnappa, in a systematic review, concluded that the comparison of those studies aimed at examining the effectiveness of health education in children was difficult due to the differences in their design and lack of similar protocols. A review of studies showed improvement in gum and plaque indexes, but the results were related to short-term follow ups. Also, the reviewed articles in this systematic study showed some improvement in their knowledge, but their attitudes and behaviors did not change so much. In fact it showed the need for longer-term studies to shed further lights on these factors (18). Oral health behaviors were educated to the anxious children in this study. The researchers could not find a similar study on anxiety and its correlation with oral health behaviors education, and it was not possible to compare the results with other studies. Therefore, it is suggested to do further studies in different age groups, especially in children, to identify oral health promotion target groups better, and to identify potential barriers to oral health behavior education as well.

Conclusion: The findings of this pilot study showed that teaching oral health behaviors to children and encouraging them to improve oral hygiene habits were effective on improving their oral health index in short term and general anxiety was not known as an obstacle to the adoption of oral health behaviors and modifying and shaping these behaviors in these children.

Acknowledgements: The authors are thankful to the Kurdistan University of Medical Sciences, Sanandaj, Iran, for financial support. (Ethical code: IR.MUK.REC.1397/137).

Conflicts of interest: The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

Refrences

1. American Association of psychiatry. Diagnostic and statistical manual of mental disorders (Fifth Edition) DSMV. Translated by yahya Seyed Mhammadi, Ravan Nashr, Tehan, 2013.

2. Zarafshan H, Mohammadi MR, Salmanian M. Prevalence of anxiety disorders among children and adolescents in Iran: a systematic review. Iranian journal of psychiatry. 2015; 10(1): 1-7.

3. Heidari M, Bakhtiyarpour S, Makvandi B, Naderi F and Hafezi F. Studying Effectiveness of the FRIENDS Program Training on Promoting Social Skills of children in Shiraz City. International journal of humanities and cultural studies, March 2016; special issue, 1058-1070.

4. Hagh Shenas H, Bahrebardar MJ, Rahman Setayesh Z. Reducing the school exams anxiety in pre-university students. Iranian journal of psychiatry and clinical psychology, 2009; 15(1): 63-69.

5. Pinkham JR, Casamassimo PS, MC Tigue DG, Field HW, Nowak A. Pediatric dentistry Infancy through adolescence. 4th ed. USA: W.B. Saunders CO. 2005; 134-6.

6. Tavakoli AR, Faraji V and Falah A. The causes of anxiety and its impact on learning. The second international conference and modern research in education, psychology and social studies of Iran, Qom, Islamic Studies and Research Center of Soroush Hekmat Mortazavi, 2016. https://www.civilica.com/Paper-ESCONF02

7. Godarzi a, Tavafian S S, Haydar nia AR and Ziadini H. Health literacy and oral hygiene in elementary school students in 14th district of Tehran. Journal of military care science. 2015; 4(6): 229-237.

8. Okoro CA, Strine TW, Eke PI, Dhingra SS, Balluz LS. The association between depression and anxiety and use of oral health services and tooth loss. Community dentistry and oral epidemiology. 2012; 40(2): 134-44.

9. Mousavi R, Moradi AR, Farzad V, Mahdavi S. Psychometric properties of the Spence children's anxiety scale with an Iranian sample. International journal of psychology. 2007; 1(1): 17-26.

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]

10. Palahang H, Rabiee M, Khoramdel K, Zereh poosh A and Sajadian p. Validity, reliability, and factor analysis of the 71-item edition of the screening of emotional disorders associated with child anxiety (SCARED-71). Journal of psychiatry and clinical psychology of Iran, 2012; 3: 202-10.

11. Spence SH, Barrett PM, Turner CM. Psychometric properties of the Spence Children's anxiety scale with young adolescents. Journal of anxiety disorders. 2003; 17(6): 605-25.

12. Hendricson WD, Cohen PA. Oral health care in the 21st century: implications for dental and medical education. Academic medicine. 2001; 76(12): 1181-206.

13. Afshar H, Aezami R, Ghandhari motlagh H, GHandhari motlagh M. Efficacy of educational intervention on plaque index among pre-school children. Iranian Journal of pediatric dentistry. 2016; 11(2): 51-60.

14. Hendi AR, Vadiati Saberi B, Jahandideh Y, Dadgaran I, Nemati S. The Effect of Training by Standardized Student Method on Decreased Dental Plaque. Research in medical education. 2016; 7(4): 56-63.

15. D'Cruz AM, Aradhya S. Impact of oral health education on oral hygiene knowledge, practices, plaque control and gingival health of 13-to 15-year-old school children in Bangalore city. International journal of dental hygiene. 2013; 11(2):126-33.

16. Babaee N, Kardan K, Agha Zade F and Noori Bayat SH. The effect of oral hygiene education on prevention of dental caries in junior high school students in Babol. Babol University of Medical Sciences, 2011; 14(1):83-89.

17. Lafzi A, Abolfzli N, Sedaghat K and Momoni M. The role of oral health education on reducing dental plaque rate. Journal of dental School - Shahid Beheshti University of Medical Sciences, 2005; 23(3): 475-483.

18. Habbu SG, Krishnappa P. Effectiveness of oral health education in children- a systematic review of current evidence (2005-2011). International dental journal, 2015; 65(2): 57-64.

[Downloaded from jiapd.ir on 2026-11-16]

[DOI: 10.29252/ijpd.14.2.99]