ORİJİNAL MAKALE / ORIGINAL ARTICLE

Balıkesir Sağlık Bilimleri Dergisi / BAUN Sağ Bil Derg
Balıkesir Health Sciences Journal / BAUN Health Sci J
ISSN: 2146-9601- e ISSN: 2147-2238
Doi: https://doi.org/10.53424/balikesirsbd.1356261

The Relationship Between Passive Smoking and Caries Experience in 1-12 Years Old Children and Its Influencing Factors

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Geliş Tarihi / Received: *06.09.2023* , ***Kabul Tarihi / Accepted:*** *06.03.2024*

ABSTRACT

Aim: The aim of this study was to evaluate the relationship between passive smoking and dental caries to which children 1-12 years old are exposed to smoke by their parents and the factors affecting this relationship. **Material and Methods:** The examination data of 900 children aged 1-12 years who were admitted to Zonguldak Bulent Ecevit University, Faculty of Dentistry, Department of Pediatric Dentistry between December 2020 and May 2021 for various reasons and underwent routine examinations and met the study criteria were retrospectively analyzed. Sociodemographic characteristics, passive smoking status and dmft/DMFT scores of the children were recorded. The relationship between passive smoking status and dmft/DMFT scores and the factors affecting this relationship were analyzed. **Results:** Statistically significant correlation was found between passive smoking status and dmft/DMFT scores of children **(p=0.000).** At the same time, a significant relationship was found between passive smoking and income level ($p<0.05$). However, no significant relationship was found between passive smoking and sex and parental education level ($p>0.05$). **Conclusion:** Passive smoking is thought to be a risk factor in caries formation. Therefore, it is important to reduce exposure to passive smoking in order to protect both oral and dental health as well as general health of children.

Keywords: Cigarette Smoke, Child, Dental Caries, Passive Smoking.

1-12 Yaş Arası Çocuklarda Pasif Sigara İçiciliği ile Çürük Deneyimi Arasındaki İlişki ve Etkileyen Faktörler

ÖZ

Amaç: Bu çalışmanın amacı, 1-12 yaş arası çocukların ebeveynleri tarafından maruz bırakıldığı pasif içicilik durumu ile diş çürükleri arasındaki ilişkinin ve bu ilişkiyi etkileyen faktörlerin değerlendirilmesidir. **Gereç ve Yöntem:** Zonguldak Bülent Ecevit Üniversitesi Diş Hekimliği Fakültesi Pedodonti Anabilim Dalı Kliniği'ne Aralık 2020-Mayıs 2021 tarihleri arasında çeşitli sebeplerle başvurmuş ve rutin muayene işlemi yapılmış, çalışma kriterlerini sağlayan 1-12 yaş arasındaki 900 çocuğa ait muayene verileri retrospektif olarak incelendi. Çocukların sosyodemografik özellikleri, pasif sigara içicilik durumu ve dmft/DMFT skorları kayıt altına alındı. Çocukların pasif içicilik durumu ile dmft/DMFT skorları arasındaki ilişki ve bu ilişkiyi etkileyen faktörler incelendi. **Bulgular:** Sonuçlar incelendiğinde çocukların pasif içicilik durumu ile dmft/DMFT skorları arasında istatistiksel olarak anlamlı ilişki tespit edildi ($p=0.000$). Aynı zamanda pasif sigara içiciliği ile gelir düzeyi arasında anlamlı bir ilişki bulundu ($p<0.05$). Ancak pasif sigara içiciliği ile cinsiyet, ebeveynlerin eğitim durumu arasında anlamlı ilişki saptanmadı ($p>0.05$). **Sonuç:** Pasif sigara içiciliği çürük oluşumunda bir risk faktörü olabileceği düşünülmektedir. Bu sebeple çocukların hem ağız ve diş sağlığı hem de genel sağlığının korunması açısından pasif sigara içiciliğine maruziyetin azaltılması önemlidir.

Anahtar Kelimeler: Sigara Dumanı, Çocuk, Diş Çürüğü, Pasif İçicilik.

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Bu makaleye atıf yapmak için / Cite this article: *Bodrumlu Hazar*, E., Şahin, E., & Can, H. (2024). The Relationship Between Passive Smoking and Caries Experience in 1-12 Years Old Children and Its Influencing Factors. *BAUN Health Sci J, 13*(2), 310-316. https://doi.org/10.53424/balikesirsbd.1356261

INTRODUCTION

Dental caries is a preventable, chronic, infectious, contagious and multifactorial disease (Touger-Decker and van Loveren, 2003). Cariogenic bacteria, fermentable carbohydrates, host and sufficient time are the main components that play a role in caries development, a disturbed balance between protective and risk factors affects the commencement and development of dental caries. The known risk factors for caries contain high numbers of acidogenic and cariogenic bacteria in the mouth, decreased salivary flow rate and buffering capacity, sensitive tooth surface, presence of maladapted dental restorations, inadequate oral hygiene habits, high intake of fermentable carbohydrates, inadequate knowledge and attitudes towards oral care habits (Chin, Kowolik and Stookey, 2015; González-Valero et al., 2018; Harris, Nicoll, Adair and Pine 2004). It is also argued that other factors such as gender, environmental, genetics, age and smoking affect the development of dental caries (Bartal, 2001).

Passive smoking, is defined as the inhalation of smoke and all detrimental substances released as a result of the combustion of tobacco products by non-smokers in open or closed areas (Avşar, Darka, Topaloğlu and Bek 2008; Jenkins, Tomkins and Guerin 2000). According to a report published by the World Health Organization in 2009, it was reported that 700 million children are exposed to cigarette smoke by their own parents, mostly at home (WHO, 2009). In Turkey, passive smoking was reported to be 81.3% in the primary school period (Ersu et al., 2004). The fact that children exposed to passive smoking have smaller bronchi and less developed immune systems causes children to be more affected by this situation. Passive smoking is reported to increase susceptibility to cancer, heart disease, asthma, respiratory diseases and neurological problems (Avşar et al., 2008; Florescu et al., 2009). In addition to systemic diseases, passive smoking also affects dental development, oral and dental health in children (Avşar, Topaloglu and HazarBodrumlu 2013). Passive smoking causes suppression of the immune system and vitamin C deficiency in children, leading to an increase in the number of cariogenic bacteria. On the other hand, when a mother who smokes and breastfeeds her baby, she plays a role in the progression of dental caries by causing oral transmission of toxic products to the baby and early colonisation of *Streptococcus mutans*. (Avşar et al., 2008; Avşar, Darka, Hazar Bodrumlu and Bek 2009; Bernabé, MacRitchie, Longbottom, Pitts and Sabbah 2017; Strauss, 2001). In addition, passive smoking affects the function and structure of the salivary glands, causing a decrease in salivary flow rate, buffering capacity and protective factors in the composition of saliva, leading to an increase in *S. mutans* colonization (Avşar et al., 2009). It is stated that environmental cigarette smoke negatively affects oral and dental health because it contains more than 4.000 chemical products (WHO, 2009). There is a lack of research investigating the correlation between passive smoking and dental caries in a significant sample size. The aim of this research was to evaluate the relationship between environmental tobacco smoke and caries and the factors affecting this relationship in children exposed to passive smoking by their parents.

MATERIALS AND METHODS

Design, setting, and sample

In this study, the examination records of 1.500 children who participated to Zonguldak Bulent Ecevit University Faculty of Dentistry, Department of Pediatric Dentistry between December 2020 and May 2021 for various reasons and underwent routine examination procedures were retrospectively analyzed. The null hypothesis is that there is no relationship between passive smoking and dental caries.

Data collection

As a result of this examination, 900 examination forms of 900 systemically healthy children aged 1-12 years without any syndromes and dental anomalies were evaluated. The patients with systemic disease, who use regular medication, had dental anomalies, and had a history of dental trauma were excluded from the study. Based on reference article results, with 95% confidence (1-α), 95% test power (1-β), and f2=0.105 effect size, the total number of cases to be included in the study was determined as 285. Age, sex, the reason for presentation to the clinic, smoking status of parents, family income level, educational level of parents and dmft/DMFT(decayed, missed, filled teeth) scores of children were recorded from the examination records of the patients. The data were collected in a blinded by a single researcher who is a specialist in pediatric dentistry. Based on these data, dmft/DMFT scores, parental education level and family income level were compared between children with and without passive smoking. At the same time, children who were passive smokers were grouped as children whose mothers smoked, children whose fathers smoked and children whose both parents smoked and their dmft scores were evaluated.

Statistical analysis

Descriptive statistical data (number, percentage, mean, standard deviation, minimum, maximum and median) were presented in the study. In the statistical analysis, the normality assumption was first checked with the Shapiro Wilk test. Mann Whitney U test was used to evaluate the difference between the averages of two independent groups that did not fit the normal distribution. Kruskal Wallis test was utilised to evaluate the means of three or more groups that did not have normal distribution. In the evaluation of the relationship between variables, Pearson Chi-Square test was used when the sample size assumption (expected value>5) was met; Fisher's Exact test was used when it was not met. Multinominal Logistic Regression analysis was utilised to model the dependent variable with independent variables. The datas were analysed in IBM SPSS 25 programme.

Ethical considerations

Ethics committee approval was received from Zonguldak Bulent Ecevit University Non-Interventional Clinical Research Ethics Committee with the decision dated 14.06.2023 and numbered 2023/12.

RESULTS

Within the scope of the study, 900 children, 474 (52%) girls and 426 boys (47.3%) aged 1-12 years, were evaluated. The mean age of the children in the current study was 7.15 years. The mean dmft/DMFT index scores of the children were 6.57. The smoking status of the parents of the children is shown in Table 1.

Table 1. Smoking status of the family.

		n	%
Smoking status of the family	Yes	422	46.9
	No	478	53.1
The smoker	Mother	62	14.7
	Father	271	64.2
	Both of them	89	21.1

In the study, the significant difference was found between passive smoking and income level ($p<0.05$). It was observed that children of middle-income families were more exposed to passive smoking. No significant differences were found between smoking status and sex, mother's and father's levels of education ($p>0.05$) (Table 2).

Table 2. Demographic characteristics of children and passive smoking status.

			Passive Smoking			
	Girl		**Yes**	**No**	**Test value**	**p**
		n	226	248	0.251	0.616
		%	47.7	52.3		
Sex		**%S.D.**	53.6	51.9		
	Boy	**n**	196	230		
		%	46.0	54.0		
		%S.D.	46.4	48.1		
	Low	**n**	16	22	8.308	**0.016***
		%	42.1	57.9		
		%S.D.	3.8	4.6		
	Middle	**n**	226	210		
Family monthly income		**%**	51.8	48.2		
		%S.D.	53.6	43.9		
	High	**n**	180	246		
		%	42.3	57.7		
		%S.D.	42.7	51.5		
	No education	**n**	3	2	6.208	0.287
		%	60.0	40.0		
		%S.D.	0.7	0.4		
	Primary School	**n**	88	106		
		%	45.4	54.6		
		%S.D.	20.9	22.2		
	Middle School	**n**	104	96		
		%	52.0	48.0		
Mother's education level		**%S.D.**	24.6	20.1		
	High School	**n**	159	172		
		%	48.0	52.0		
		%S.D.	37.7	36.0		
	University	**n**	62	91		
		%	40.5	59.5		
		%S.D.	14.7	19.0		
	MSc/PhD	**n**	6	11		
		%	35.3	64.7		
		%S.D.	1.4	2.3		

Table 2 (continue). Demographic characteristics of children and passive smoking status.

					Test value	p
Father's education level	No education	**n**	0	1	9.408	0.094
		%	0.0	100.0		
		%S.D.	0.0	0.2		
	Primary school	**n**	71	79		
		%	47.3	52.7		
		%S.D.	16.8	16.6		
	Middle school	**n**	101	84		
		%	54.6	45.4		
		%S.D.	23.9	17.6		
	High school	**n**	166	194		
		%	46.1	53.9		
		%S.D.	39.3	40.7		
	University	**n**	78	104		
		%	42.9	57.1		
		%S.D.	18.5	21.8		
	MSc/PhD	**n**	6	15		
		%	28.6	71.4		
		%S.D.	1.4	3.1		

*p<0.05 and S.D: Smoking status.

In present study, the significant relationship was found between the mean ages of children according to passive smoking status (p<0.05). The mean age of children who were passive smokers was higher than the mean age of children who were not passive smokers. The significant relationship was found between the mean dmft/DMFT index scores of children according to parental smoking status (p<0.05). The mean dmft/DMFT score of children exposed to cigarette smoke was higher than the mean dmft/DMFT score of those who were not exposed (Table 3).

Table 3. Comparison of age and dmft/DMFT scores of children according to passive smoking.

	Cigarette smoke exposure	n	X	Standard deviation	Median	Rank average	Test value	P
Age	Yes	422	7.46	3.26	5.9	473.07	91333.0	**0.014***
	No	478	6.87	3.20	7	430.57		
dmft/DMFT	Yes	420	7.27	4.14	5.8	493.04	82093.5	**0.000***
	No	478	5.94	4.36	6	411.24		

*p<0.05

In the study, no significant difference was found between the mean dmft/DMFT scores of children according to the parents who smoked at home (p>0.05) (Table 4). The null hypothesis is rejected.

Table 4. dmft/DMFT scores of children according to smoking parents.

dmft/DMFT	Smoking Parents	n	X	Standard deviation	Median	Rank average	Test statistic	P
	Mother	62	8.0484	4.622	8	232.12	2.3300	0.31
	Father	269	7.1078	4.085	7	206.47		
	Both of them	89	7.2247	3.945	7	207.61		

DISCUSSION

Environmental tobacco smoke refers to the mixed of main smoke exhaled and side stream smoke that contamines the air where tobacco is smoked. Exposure to environmental tobacco smoke is called passive smoking (Chan-Yeung & Dimich-Ward, 2003). Tobacco and tobacco smoke contain more than 4.000 different compounds, containing tar, carbonmonoxide, hydrogen cyanide, ammonia, formaldehyde, benzen and nicotine (John, Savitz and Sandler 1991). Cigarettes account for approximately 65-85% of global tobacco use. Approximately 20-80% of the World population is affected by the damaging effects of cigarette smoke. The negative effects of passive smoking are similar to those of active smoking and children are more vulnerable to those effects than adults in the first years of life (Bartal, 2001). Children are exposed to passive smoking in many different ways. In the prenatal period by the mother being an active or passive smoker, and in the postnatal period if the child being exposed to cigarette smoke by parents and other family members lead to passive smoking in children (Majorana et al., 2014; Tanaka, Miyake and Sasaki 2010).

In the current study, we investigated the impact of passive smoking on dental caries in children aged 1-12 years. The results show that children who were passive smokers had higher dmft/DMFT index scores. Mosharrafian et al. (Mosharrafian, Lohoni and Mokhtari 2020) also reported that a significant relationship between caries and secondhand smoking in children and children who exposed to cigarette smoke have been found to have more caries. It has been reported that this may be related to the cotinine in cigarettes affecting oral tissues and increasing plaque accumulation. Similarly, Nayani et al. (Nayani et al., 2018) evaluated the relationship between environmental tobacco smoke and dental caries in children aged 5-14 years and reported a relationship between passive smoking and caries. The reason for this was reported as an increase in the number of cariogenic bacteria and suppressing the immune system by nicotine via reducing the phagocytic activity of monocytes and neutrophils. Similar to this study, Tanaka et al. (Tanaka et al., 2015) reported the relationship between environmental tobacco smoke and caries in children during primary and permanent dentition in a study conducted in children aged 1-14 years in Japan. Patil (Patil, 2016) reported a correlation between environmental tobacco smoke and caries' prevalence in permanent teeth in a study conducted in children aged 4-11 years in the USA. It is thought be that the results of this study might be related to the susceptibility of children who are passive smokers to mouth breathing, the inhalation of cigarette smoke through the mouth and the transmission of toxic substances from the parent who is an active smoker to the child, resulting in an increase in the number of *S.mutans.* In contrast to this study results, Nakayama and Mori (Nakayama and Mori, 2015) reported that there was no significant relationship between secondhand smoking and dental caries in 3-aged children. It has been reported that frequently eating sugary foods is a factor in the formation of dental caries. In addition, in the present study, it was reported that there was no relationship between the dmft/DMFT index scores observed in children who were passive smokers and whether the parents were active smokers or not. In contrast to this study, in a similar study conducted by Williams et al. (Williams, Kwan and Parsons, 2000), a significant difference was found between children's dmft/DMFT scores and active smoker parents. It was reported that dmft/DMFT scores were higher in children whose mothers were active smokers. It is thought that the reason why no significant difference was observed in this study's result may be due to the fact that the number of children whose mothers were active smokers was less in the study group.

In the literature, it is reported that there is a relationship between environmental tobacco smoke and various sociodemographic factors. It has been observed that passive smoking at homes and indoor workplaces is higher in societies with low socioeconomic levels (Nazar, Lee, Arora and Millett 2016). In this study, a significant difference was found between family income status and children's exposure to passive smoking and a higher rate of secondhand smoke exposure was observed in children of middle-income families. Similarly, Nayani et al. (Nayani et al., 2018) reported that the children from families with low socioeconomic status were more exposed to environmental tobacco smoke. It was also reported that the pervasiveness of caries was higher in children whose families with low socioeconomic status. In a systematic review, 11 studies on the relationship between parental smoking status and family income statu were examined and as a result of this review, it was reported that there was a relationship between low income statutus and passive smoking in 10 of the relevant studies (Orton, Jones, Cooper,Lewis and Coleman 2014). In this study, no relationship was observed between the parents' education status and passive smoking in children. Similar to the results of this study, in the study conducted by Umutlu (Umutlu, 2022) concerning the effect of planned education given to parents about smoking in the home environment and passive smoking exposure of children, no significant relationship was observed between the educational level of parents and passive smoking of children. In the study conducted by Akçay and Özcebe (Akçay and Özcebe, 2018) on passive smoking in children in the home environment, it was reported that there was no significant relationship between smoking and mother's education statu, while there was a significant ralationship between smoking and father's education level. Gilman et al. (Gilman et al., 2008) reported that the number of cigarette packs smoked per year was higher in individuals with lower than high school education. In a systematic review, it has been reported that there was a significant relationship between parent's smoking status and lower levels of education and children being exposed to cigarette smoke mostly and continuously in the home environment (Orton et al., 2014). The variations in the results of all these studies may be related to the type of study, study populations with various cultures, different lifestyles and differences in dietary factors.

CONCLUSION

Passive smoking is a public health problem that affects not only general health but also oral and dental health. In the present study's results show that there is a relationship between passive smoking and dental caries. Reducing passive smoking is important not only for improving children's oral health for preventing other chronic diseases as well. For this reason, early education of parents about passive smoking is consequential.

Limitations of the study

As the research only covered Zonguldak Province, it cannot be generalized to Türkiye. Research data are limited to employee statements.

Acknowledgement

The authors would like to extend their sincere thanks to anyone who contributed to this study.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: EHB, CH, ŞE; **Material, methods and data collection:** EHB, CH, ŞE; **Data analysis and comments:** EHB, CH, ŞE; **Writing and corrections:** EHB CH, ŞE.

Funding

None.

Ethical considerations

Ethics committee approval was received from Zonguldak Bulent Ecevit University Non-Interventional Clinical Research Ethics Committee with the decision dated 14.06.2023 and numbered 2023/12.

REFERENCES

Akçay, D., & Özcebe, L. (2018). Çocukların evde sigara dumanından pasif etkilenme durumlarının incelenmesi. Zeynep Kamil Tıp Bülteni.

Avsar, A., Topaloglu, B., & Hazar-Bodrumlu, E. (2013). Association of passive smoking with dental development in young children. *European Journal of Paediatric Dentistry*, *14*(3), 215–218.

Avşar, A., Darka, O., Hazar Bodrumlu, E. & Bek, Y. (2009). Evaluation of the relationship between passive smoking and salivary electrolytes, protein, secretory IgA, sialic acid and amylase in young children. *Archives of Oral Biology*, *54*(5), 457–463. https://doi.org/10.1016/j.archoralbio.2009.01.017

Avşar, A., Darka, O., Topaloğlu, B., & Bek, Y. (2008). Association of passive smoking with caries and related salivary biomarkers in young children. *Archives of Oral Biology*, *53*(10), 969–974.

Bartal, M. (2001). Health effects of tobacco use and exposure. *Monaldi Archives For Chest Disease*, *56*(6), 545–554.

Bernabé, E., MacRitchie, H., Longbottom, C., Pitts, N. B., & Sabbah, W. (2017). Birth weight, breastfeeding, maternal smoking and caries trajectories. *Journal of dental research*, *96*(2), 171–178. https://doi.org/10.1177/0022034516678181

Chan-Yeung, M., & Dimich-Ward, H. (2003). Respiratory health effects of exposure to environmental tobacco smoke. *Respirology (Carlton, Vic.)*, *8*(2), 131–139.

Chin, J. R., Kowolik, J. E., & Stookey, G. K. (2015). Dental caries in the child and adolescent. *McDonald and Avery's Dentistry for the Child and Adolescent*, 155-176. https://doi.org/10.1016/b978-0-323-28745-6.00009-0

Ersu, R., Arman, A. R., Save, D., Karadag, B., Karakoc, F., Berkem, M., et al. (2004). Prevalence of snoring and symptoms of sleep-disordered breathing in primary school children in istanbul. *Chest*, *126*(1), 19–24.

Florescu, A., Ferrence, R., Einarson, T., Selby, P., Soldin, O., & Koren, G. (2009). Methods for quantification of exposure to cigarette smoking and environmental tobacco smoke: Focus on developmental toxicology. *Therapeutic Drug Monitoring*, *31*(1), 14–30.

Gilman, S. E., Martin, L. T., Abrams, D. B., Kawachi, I., Kubzansky, L., Loucks, E. B., et al. (2008). Educational attainment and cigarette smoking: A causal association? *International Journal of Epidemiology*, *37*(3), 615–624.

González-Valero, L., Montiel-Company, J. M., Bellot-Arcís, C., Almerich-Torres, T., Iranzo-Cortés, J. E., & Almerich-Silla, J. M. (2018). Association between passive tobacco exposure and caries in children and adolescents. A systematic review and meta-analysis. *PloS one*, *13*(8), e0202497. https://doi.org/10.1371/journal.pone.0202497

Harris, R., Nicoll, A. D., Adair, P. M., & Pine, C. M. (2004). Risk factors for dental caries in young children: A systematic review of the literature. *Community Dental Health*, *21*(1 Suppl), 71–85.

Jenkins, R. A., Tomkins, B., & Guerin, M. R. (2000). The Chemistry of Environmental Tobacco Smoke: Composition and Measurement. CRC Press.

John, E. M., Savitz, D. A., & Sandler, D. P. (1991). Prenatal exposure to parents' smoking and childhood cancer. *American Journal of Epidemiology*, *133*(2), 123–132.

Majorana, A., Cagetti, M. G., Bardellini, E., Amadori, F., Conti, G., Strohmenger, L., et al. (2014). Feeding and smoking habits as cumulative risk factors for early childhood caries in toddlers, after adjustment for several behavioral determinants: A retrospective study. *BMC Pediatrics*, 14, 45. https://doi.org/10.1186/1471-2431-14-45

Mosharrafian, S., Lohoni, S., & Mokhtari, S. (2020). Association between dental caries and passive smoking and its related factors in children aged 3-9 years old. International Journal of Clinical Pediatric Dentistry, 13(6), 600–605.

Nakayama, Y., & Mori, M. (2015). Association of environmental tobacco smoke and snacking habits with the risk of early childhood caries among 3-year-old Japanese children. Journal of Public Health Dentistry, 75(2), 157–162. https://doi.org/10.1111/jphd.12085

Nayani, A. A., Iqbal, R., Azam, S. I., Khan, F. R., Khan, A. H., Janjua, N., et al. (2018). Association between environmental tobacco smoke and dental caries amongst 5-14 years old children in Karachi, Pakistan. JPMA. *The Journal of The Pakistan Medical Association*, *68*(2), 203–209.

Nazar, G. P., Lee, J. T., Arora, M., & Millett, C. (2016). Socioeconomic inequalities in secondhand smoke exposure at home and at work in 15 low- and middle-income countries. Nicotine & Tobacco Research: Official journal of the Society for Research on Nicotine and Tobacco, 18(5), 1230–1239. https://doi.org/10.1093/ntr/ntv261

Orton, S., Jones, L. L., Cooper, S., Lewis, S., & Coleman, T. (2014). Predictors of children's secondhand smoke exposure at home: A systematic review and narrative synthesis of the evidence. *PloS one*, *9*(11), e112690. https://doi.org/10.1371/journal.pone.0112690

Patil, A. (2016). Secondhand smoke: A man-made disaster to oral health of children!. Children, 5(12), 13258-13261

Strauss R. S. (2001). Environmental tobacco smoke and serum vitamin C levels in children. *Pediatrics*, *107*(3), 540–542.

Tanaka, K., Miyake, Y., & Sasaki, S. (2010). Intake of dairy products and the prevalence of dental caries in young children. *Journal of Dentistry*, *38*(7), 579–583.

Tanaka, S., Shinzawa, M., Tokumasu, H., Seto, K., Tanaka, S., & Kawakami, K. (2015). Secondhand smoke and incidence of dental caries in deciduous teeth among children in Japan: population based retrospective cohort study. *BMJ (Clinical Research Ed.)*, *351*, h5397. https://doi.org/10.1136/bmj.h5397

Touger-Decker, R., & van Loveren, C. (2003). Sugars and dental caries. *The American Journal of Clinical Nutrition*, *78*(4), 881S–892S.

Umutlu, S. (2022). Ebeveynlere verilen planlı eğitimin ev ortamında sigara içilme durumuna ve 0-5 yaş arası çocuklarin pasif içicilik maruziyetine etkisi. Yüksek Lisans Tezi, Sivas Cumhuriyet Üniversitesi, Sivas.

Williams, S. A., Kwan, S. Y., & Parsons, S. (2000). Parental smoking practices and caries experience in pre-school children. *Caries Research*, *34*(2), 117–122.

World Health Organization. (2009). WHO report on the global tobacco epidemic, 2009: Implementing smoke-free environments. World Health Organization.