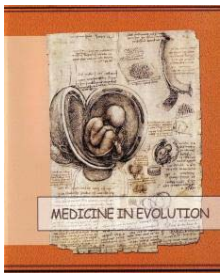
Factors that can determine children's oral health behaviour



Jumanca D.[1], Galuscan A.[1], Matichescu L.M.[2], Matichescu A.[1], Dragoș B.[4], Bratu D.C.[3]

[1]*Department of Preventive, Community and Oral Health Dentistry, Faculty of Dentistry, "Victor Babeș" University of Medicine and Pharmacy, Timisoara.*
[2]*Department of Sociology, Faculty of Sociology and Psychology, West University of Timisoara, Timisoara.*
[3]*Department of Orthodontics, Faculty of Dental Medicine, "Victor Babeș" University of Medicine and Pharmacy, Timișoara*
[4]*Department of Pedodontics, Faculty of Dental Medicine, "Victor Babeș" University of Medicine and Pharmacy, Timișoara*

Correspondence to:
Name: Lupsa Marius Matichescu
Address: B-dul Vasile Parvan, nr 4, office 318
Phone: +40 722192118
E-mail address: marius.matichescu@e-uvt.ro

Abstract

The purpose of our article is to highlight the factors that determine a higher frequency of brushing teeth among children in grades 1-4. In this sense, a questionnaire was applied on a number of 1014 of pupils from Timiș County studying in urban and rural schools. To analyse the incidence of the factors on the frequency of teeth brushing in children, we performed the linear regression analysis constructed in a progressive manner. Based on a sample of more than 1000 interviewed children, our study makes an important contribution to the development of literature in the field. Based on our results we can say that girls they are much more likely than boys to have a sanogenic behaviour in relation to oral hygiene. At the same time, once again our research highlights the importance of information and prevention.

Keywords: Information, motivation, children, eating behaviour

INTRODUCTION

The literature shows that prevention, knowledge, individual belief and attitudes are considered to have an important role in oral health care and oral self-care practice. The relation between psychosocial dimension and oral health behaviour has been analysed by several different studies. The study realized by Freeman and Linden in 81 college students among 214 participants, indicate that an adequate oral hygiene behaviour has been associate with individual's attitude toward oral health and with the perceived influence of the other persons that are part of the respondent's social capital (Freeman R 1995). We consider oral behaviour not just a matter of "just tooth brushing and flossing" (Buunk-Werkhoven YA 2011), but also as a complex and multidimensional process that include instruction, motivation, a matter of doing and specifics effects.

Tooth brushing is considered to be an important method for maintaining gum health and controlling plaque formation, particularly when combined with fluoride toothpaste. For this reason, the role of tooth-brushing in the prevention of caries has long been considered self-evident. In the same time there is little evidence to support the notion that just tooth brushing action without respecting several criteria as time for brushing or instruction, could reduce caries (A. BICA 2016). Recent publications have shown that daily tooth-brushing with fluoride toothpaste and for 2 minutes, significantly reduces caries incidence compare to a control group that also brushed with a fluoride toothpaste but receive no instructions restricting rinsing (Tinanoff 2002). Another important aspect in terms of brushing teeth is the daily frequency. This point, we know that twice per day brushing with fluoridated toothpaste is effective universally recommended (Milgrom 2011). Realized twice per day, it works by disrupting the bacteria growing on the teeth and by providing a reservoir of fluoride to repair the damage caused by the acid of the bacteria.

Adair et al. found that the most significant predictors of children's favourable habits were parents' favourable attitudes towards controlling their children's tooth brushing and sugar snacking habits (Adair 2004). Studies have reported that poor attitude of parents toward oral health of infants and young children are associated with increased caries prevalence (Hinds K 1995). Young children's oral health maintenance and outcomes are influenced by their parent's knowledge and beliefs, which affect oral hygiene and healthy eating habits (Suresh BS 2016). Parent's knowledge and positive attitude toward good dental care are very important in the preventive cycle (Anamaria Matichescu 2016).

In Sweden an experiment has been done to establish a correlation between intake of sugars and dental caries. This experiment proved that restriction of sugar intake to four meals daily did not significantly increase the caries incidence, but if larger amount of sugar was given, the development of caries increased significantly (Ogawa 2018). We consider nutrition not just a matter "of eating and drinking"', but also a complex process that include instruction, motivation with significant implication oral health care and behaviour.

MATERIAL AND METHOD

The purpose of our article is to highlight the factors that determine a higher frequency of brushing teeth among children in grades 1-4. In this sense, a questionnaire was applied on a number of 1014 of pupils from Timiş County studying in urban and rural schools. The frequency of teeth brushing was measured with reference to the following indicators: 1. Never, 2. Once, 3. Twice or three times, 4. Once a day, 5. Twice a day, 6. Three or more times a day. In order to identify the factors that determine a lower or higher frequency of brushing, the following dimensions were introduced in the analysis: the degree of information on teeth brushing, the reason why children brush their teeth, the control over brushing, the type of

equipment and auxiliaries used, and last but not least the eating behaviour and demographic characteristics of the pupils interviewed.

In a concrete way and in a detailed perspective, the operationalization of these dimensions was measured by means of the following indicators that showed a significant correlation with the frequency of brushing[1]:

1. Information on teeth brushing
   - So far, has someone told you about brushing your teeth?
   - Who did you talk to about brushing your teeth? –mother or father
   - Who did you talk to about brushing your teeth? – dentist
   - Did one of these people show you how to brush your teeth?
   - At the moment how well do you think you know how to brush your teeth?
2. The reason for teeth brushing.
   - Do you brush your teeth in order to avoid bad breath?
   - Do you brush your teeth in order to avoid toothache?
3. Auxiliary behaviour to teeth brushing
   - After teeth brushing, do you also use mouthwash?
   - After teeth brushing, do you also use dental floss?
   - After teeth brushing, do you also use fluoride tablets?
   - After teeth brushing, do you also use an interdental toothbrush?
4. Teeth brushing control.
   - Does someone check if you brushed your teeth?
   - So far you have been to the dentist at least once?
5. Eating behaviour
   - Over the last week how often have you consumed candy?
   - Over the last week how often have you consumed apples?
   - Over the last week how often have you consumed toffees?
   - Over the last week how often have you consumed oranges?
   - Over the last week how often have you consumed dairy products?
   - Over the last week how often have you consumed crisps?
   - Over the last week how often have you consumed pears?
   - Over the last week how often have you consumed carrots?
   - Over the last week how often have you consumed chewing gum?
6. Socio-demographic data
   - Gender
   - Grade
   - The prestige level of the mother's profession
   - The prestige level of the father's profession

In order to highlight the relationship between the frequency of brushing on the teeth during the last week and the dimensions mentioned above, a linear regression analysis was performed, in which the frequency of teeth brushing was the dependent dimension, and all the other dimensions were independent.

RESULTS

To analyse the incidence of the above factors on the frequency of teeth brushing in children, we performed the linear regression analysis constructed in a progressive manner. Thus, in the first stage, were introduced the demographic variables and only those that

[1]The list of indicators was a more comprehensive one and can be found in the questionnaire. In this article were retained only those indicators that showed a significant correlation with the frequency of teeth brushing.

showed a statistically significant relationship were retained. In the second stage, in addition to the demographic variables, were introduced the information variables. In the same way, only the variables that maintained their significant relationship were kept, and then the variables related to the reason for brushing were introduced in the model. In the same logic, the 6 categories of factors were introduced in the model one by one, as they are presented in table number 1. Concretely, by analysing the evolution of R from one stage to another, we can understand the contribution that each category of predictors has on the ability to explain the statistical model.

Table 1. Summery model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,122[a]	,015	,014	1,155
2	,231[b]	,053	,050	1,134
3	,273[c]	,075	,068	1,123
4	,318[d]	,101	,093	1,108
5	,336[e]	,113	,103	1,102

In order to determine the factors that determine the healthiest behaviour regarding teeth brushing per day, the socio-demographic characteristics of the respondents were the first type of factor taken into account in our analysis. Even if the bivariate correlation analysis highlighted a significant relationship of the above-mentioned dimensions with frequent teeth brushing, in the regression analysis, only the gender of the respondent remained a determining factor after the introduction of all factors in the model. Thus, the genre analysed independently in relation to the frequency of teeth brushing presents a sig=,001 and a coefficient Beta=,285, relationship that remains significant in the fifth stage of the model, at which point all other factors are introduced, and the value sig=,023 with a coefficient Beta=,190. In a concrete way, these results highlight the fact that girls have a significantly higher frequency of brushing their teeth than boys.

The analysis of the relationship between information and the frequency of teeth brushing, highlighted once again what is so well known in the specialty literature: the invaluable role of information for the development of a sanogenic behaviour. Statistical evidence has shown that when it comes to information, the power of the model is much more important and with much stronger effects than the simple information made by parents or even the dentist. Thus, it can be seen that the example of brushing your teeth has a much greater impact than just information, even if it is done by the parents or even by the doctor. This is evidenced by the level of significance sig=,001 and a Beta of,574, which makes this indicator the most important predictor of brushing. In other words, the presentation of how children should brush their teeth is the most important factor in explaining the frequency of brushing their teeth. Children who have been shown how to brush their teeth will brush their teeth much more often than those who have not been shown this.

As the results of our research show, another important factor in the information dimension is its result, materialized in the degree of knowledge of how subjects know how to brush their teeth. The initiated regression analysis showed that people who appreciate that they know how to brush their teeth, will declare that they brush their teeth much more often than people who say that they know less how to brush their teeth. This significant relationship is supported by a sig=,000 and a coefficient Beta=,304. This result highlights the fact that as children get to know how to brush their teeth, the likelihood of them brushing their teeth more often increases.

Table 2. a. Dependent Variable: q10 Over the last week, how often did you brush your teeth? (1. Never, 2. Once, 3. Twice or three times, 4. Once a day, 5. Twice a day, 6. Three or more times a day)

Model		Unstandardized Coefficients		Standard Coeff.		
		B	Std. Error	Beta	t	Sig.
5	(Constant)	6,910	,355		19,491	,000
	Gender	,190	,083	,082	2,283	,023
	Has one of these people shown you how to brush your teeth?	,574	,178	,113	-3,214	,001
	How well do you think you know how to brush your teeth now?	,304	,065	,165	-4,657	,000
	Do you brush your teeth in order to avoid toothache?	,208	,089	,083	-2,326	,020
	So far, have you been to the dentist at least once?	,106	,060	,063	-1,759	,079
	After having brushed your teeth, do you also use dental floss?	,170	,058	,105	-2,905	,004
	After having brushed your teeth, do you also use an interdental brush?	,185	,062	,107	-2,992	,003
	Over the last week, how often have you consumed crisps?	-,129	,042	-,108	-3,041	,002

The analysis of the relationship between the reason for teeth brushing and its frequency has highlighted the fact that the most important reason why the subjects of our research brush their teeth is the fear of pain. This predictor is stronger than bad breath, and the only one that remains significant in the regression model. This relationship is highlighted by a sig=0,20 and a value of the coefficient beta = 208.

Another important predictor for the frequency of brushing is the control actions on teeth brushing. Even though we initially introduced two predictors in this analysis, going to dental check-ups to the doctor and the check made by a family member, both in relation to brushing their teeth, only going to a doctor's specialist consultation proves to be a significant predictor for the frequency of teeth brushing. This relationship is supported by a relatively marginal level of significance sig=,079 and by a beta=,106.

The type of toothbrush used as well as the type of auxiliary products used to achieve dental hygiene were another dimension used for the development of our statistical model. Of all the variables presented above and introduced in the model, two of them proved to be stable predictors for the frequency of brushing. Based on the statistical results obtained, we could observe that the pupils who use dental floss (sig=,004; Beta =,170) and interdental brushes (sig=,003; Beta =,185) are at the same time much more likely to brush their teeth more often than those who do not use these auxiliary dental hygiene products.

Last but not least, in our model, the eating behaviour of children was provided as a predictor for the frequency of brushing. To understand if there is a relationship between the type of products that children consume and the frequency of teeth brushing, the consumption of a wide variety of products were evaluated from apples to toffee and crisps. Following the regression analysis, we could observe that there is a significant statistic relationship between the frequency of teeth brushing and the consumption of only one type of product: crisps. There is an inversely proportional relationship between crisps consumption and the frequency of teeth brushing. The higher the crisps consumption, the lower the frequency of teeth brushing.

CONCLUSIONS

Based on a sample of more than 1000 interviewed children, our study makes an important contribution to the development of literature in the field. Based on our results we can say that girls they are much more likely than boys to have a sanogenic behaviour in relation to oral hygiene. At the same time, once again our research highlights the importance of information and prevention. In this sense, our approach has shown that showing how to brush your teeth properly matters much more than just training on the need for brushing. As a result, the more children say they know how to brush their teeth, the more likely they are to brush their teeth more often. Also, in relation to education and prevention, the data regarding food consumption and the adjacent means of hygiene maintenance prove the importance of sanogenic education. Children who eat fewer crisps say they brush their teeth more often, and those who use dental and interdental toothbrushes are more likely to brush their teeth than those who do not use such hygiene methods. Strengthening the knowledge already known from the literature, our research showed that there is a direct relationship between the frequency of going to the dentist and the frequency of teeth brushing. Children who go to a dentist more often will brush their teeth much more often than those who tend to go less often or not at all.

Thus, based on empirical evidence, our analysis provides a solid theoretical basis for the development of future public policies on oral health. The results of our research can provide support for policy development in line with the social realities for which they are developed, while focusing on the elements that have the greatest impact.

REFERENCES

1. Health directed and health related dimensions of oral health behaviours of periodontal referrals. Freeman R, Linden G. 1995, Community Dent Health, págs. 48-51.
2. Determinants of oral hygiene behavior: a study based on the theory of planned behavior. Buunk-Werkhoven YA, Dijkstra A, van der Schans CP. 2011, Community Dent Oral Epidemiol, págs. 250-259.
3. Implications of WHO Guideline on Sugars for dental health professionals. Ogawa, Paula Moynihan Yuka Makino Poul Erik Petersen Hiroshi. 2018, Community Dent Oral Epidemiol., págs. 1-7.
4. Current understanding of the epidemiology, mechanisms, and prevention of dental caries in preschool children. Tinanoff, N., Kanellis, M.J., Vargas, C.M. 2002, Pediatric Dentistry, págs. 543-551.
5. Empowering Head Start to Improve Access to Good Oral Health for Children from Low Income Families. Milgrom, P., Weinstein, P., Huebner, C., Graves, J., Tut, O. 2011, Maternal Child Health Journa, págs. 876-882.
6. Familial and cultural perceptions and beliefs of oral hygiene and dietary practices among ethnically and socioeconomically diverse groups. Adair, P.C., Pine, G., Burnside, L, Nicol, A, & Gillett, A., Anwar S. 2004, Community Dental Health" págs. 102-111.
7. Hinds K, Gregory JR. National diet and nutrition survey Children aged 11/2 to 4 1⁄2 years. London: HMSO, 1995.
8. Mother's knowledge about pre-school child's oral health. Suresh BS, Ravishankar TL, Chaitra TR, Mohapatra AK, Gupta V. 2016, OURNAL OF INDIAN SOCIETY OF PEDODONTICS AND PREVENTIVE DENTISTRY, págs. 282-287.
9. Oral hygiene behaviour. Case study of primary school children from Timis county. Anamaria Matichescu, Marius Lupsa Matichescu, Alexandru Simion Ogodescu, Magda Mihaela Luca, ROSU Sorana. 2016, Revista de Cercetare si Interventie Sociala, págs. 142-155.
10. Tooth Brushing Behavior in 6-11 Year Olds Children and the Importance of a Break of Tooth Brush Once a Day in Schoo. A. BICA, A. C. PODARIU, C. D. KREMS, A. S. PODARIU, R. A. POPOVICI. 2016, Revista de Cercetare si Interventie Sociala, págs. 115-124.