

## Use of the web in promoting education in oral health among schoolchildren

### Uso da web na promoção de educação em saúde bucal em escolares

DOI:10.34117/bjdv7n3-184

Recebimento dos originais: 08/02/2021

Aceitação para publicação: 09/03/2021

#### **Renata Barbosa Vogel**

MSc, School of Dentistry, Federal Fluminense University  
Rua Mario Santos Braga, 30 - Centro, Niterói - RJ, 24020-140, Brasil  
Email: rbvogel@ig.com.br

#### **João Victor Frazão Câmara**

MSc student, Department of Biological Sciences, Bauru School of Dentistry,  
University of São Paulo  
Alameda Dr. Octávio Pinheiro Brisolla, 9-75 - Jardim Brasil, Bauru - SP, 17012-901,  
Brasil  
Email: jvfrazao92@hotmail.com

#### **Gisele Damiana da Silveira Pereira**

Associate Professor, Department of Dental Clinic, School of Dentistry, Federal  
University of Rio de Janeiro  
Avenida Pedro Calmon, 550 Reitoria - Cidade Universitária da Universidade Federal do  
Rio de Janeiro, Rio de Janeiro - RJ, 21941-901, Brasil  
Email: giseledamiana@yahoo.com

#### **Isabel Ferreira Barbosa**

PhD, Piracicaba School of Dentistry, State University of Campinas  
Avenida Limeira, 901, Piracicaba - SP, 13414-903, Brasil  
Email: barbosa.isabelferreira@gmail.com

#### **Renato Feres de Carvalho Vianna**

MSc, Department of Dental Clinic, School of Dentistry, Federal University of Rio de  
Janeiro  
Avenida Pedro Calmon, 550 Reitoria - Cidade Universitária da Universidade Federal do  
Rio de Janeiro, Rio de Janeiro - RJ, 21941-901, Brasil  
Email: rfcv@hotmail.com

#### **Justine Monteiro Monnerat Tinoco**

Adjunct Professor, Department of Dental Clinic, School of Dentistry, Federal  
University of Rio de Janeiro  
Avenida Pedro Calmon, 550 Reitoria - Cidade Universitária da Universidade Federal do  
Rio de Janeiro, Rio de Janeiro - RJ, 21941-901, Brasil  
Email: justinemonnerat@yahoo.com.br

**Hana Fried**

PhD, Department of Dental Clinic, School of Dentistry, Federal University of Rio de Janeiro  
Avenida Pedro Calmon, 550 Reitoria - Cidade Universitária da Universidade Federal do Rio de Janeiro, Rio de Janeiro - RJ, 21941-901, Brasil  
Email: hf1000@gmail.com

**Sonia Groisman**

Title Professor, Department of Social and Preventive Dentistry, School of Dentistry, Federal University of Rio de Janeiro  
Avenida Pedro Calmon, 550 Reitoria - Cidade Universitária da Universidade Federal do Rio de Janeiro, Rio de Janeiro - RJ, 21941-901, Brasil  
Email: sonia@dentistas.com.br

**João Victor Frazão Câmara** Corresponding author

Adress: Alameda Doutor Octávio Pinheiro Brisolla, 6-65, ap 61, Zip code 17012-059, Vila Santa Teresa, Bauru, SP, Brasil.  
Email: jvfrazao92@hotmail.com  
Telephone number: +5521983844255

**ABSTRACT**

This study aimed to evaluate the acceptance and acquisition of knowledge through web learning related to self-care for the maintenance of oral health. The study population was children from the 4th and 5th school year, from 9 to 16 years old. It was evaluated Visible Plaque Index and Gingival Bleeding Index. Participants' knowledge was tested at baseline and then evaluated after each web distance education moment. This education process had four web distance moments. The evaluation of knowledge was done through a questionnaire containing 10 closed questions. The time interval was 30 days between the 1st and 2nd meetings and 60 days between the subsequent meeting. Concerning the questionnaires, the different moments were compared by chi-square (X<sup>2</sup>). Only question number six presented a statistical significance at 5%, however, between the first and the second moment 100% of the questions had a significant increase of correct answers ( $p > 5\%$ ). It is concluded that oral health education by web, was able to improve oral hygiene and knowledge related to oral health.

**Keywords:** Web Browser; Education, Distance; Health Promotion

**RESUMO**

Este estudo objetivou avaliar a aceitação e aquisição de conhecimentos por meio da aprendizagem na web relacionados ao autocuidado para a manutenção da saúde bucal. A população do estudo foi constituída por crianças de 4º e 5º ano letivo, de 9 a 16 anos. Foram avaliados o Índice de Placa Visível e o Índice de Sangramento Gengival. O conhecimento dos participantes foi testado no início e depois avaliado após cada momento de educação a distância na web. Esse processo educacional teve quatro momentos a distância na web. A avaliação do conhecimento foi feita por meio de um questionário contendo 10 questões fechadas. O intervalo de tempo foi de 30 dias entre a 1ª e 2ª reunião e 60 dias entre a reunião subsequente. Em relação aos questionários, os diferentes momentos foram comparados pelo qui-quadrado (X<sup>2</sup>). Apenas a questão número seis apresentou significância estatística a 5%, porém, entre o primeiro e o segundo

momento 100% das questões tiveram aumento significativo de acertos ( $p > 5\%$ ). Conclui-se que a educação em saúde bucal pela web, foi capaz de aprimorar a higiene bucal e os conhecimentos relacionados à saúde bucal.

**Palavras-chave:** Navegador; Educação a Distância; Promoção da Saúde

## 1 INTRODUCTION

Distance Education (DE) is an innovative way of learning. It emerged in 1969 and had its great development from the mid-nineteenth century, disseminating through the new information and communication technologies for the use of information technology. Globalization and the satellite media, using the internet, have led to an accelerated pace in the generation and transmission of new knowledge.<sup>1</sup>

DE directs the target audience to gain more space in the social context by offering education even in remote places, making it a motivational tool to promote health and well being, including oral health. Direct contact with new communication technologies can spark interest in a fairer education that can be available to all and for all.<sup>2</sup>

It is important to lead to the school environment, where computers are often seen only as a fun instrument. It serves as a subsidy for improving oral and general health through the promotion of self care in a stimulating, interactive and contemporary way. The use of distance education, stimulates self-learning and broadens citizenship, since it promotes social insertion by making individuals a participatory agent in building a better quality of life by adopting and promoting oral and general health habits.<sup>3</sup>

The objective of this study was to evaluate the capacity of the DE to promote behavior change in favor of oral health, through the survey of VPI and GBI indexes.

## 2 MATERIALS AND METHODS

The study, conducted at Escola Municipal Rotary do Brasil, at Ilha do Governador in Rio de Janeiro, Brazil, was aimed at a target audience comprised children from the 4<sup>th</sup> and 5<sup>th</sup> years, a total of 113 students ranging from 9 to 16 years old. This research got approved by the Committee on Ethics in Research with approval number 320,005 and with signatures of the Free and Informed Consent Forms and the Consent Term. It consisted of following steps: **1<sup>st</sup> step (30 days later)** – Survey using VPI and GBI indexes using a specific patient's chart and performed by a trained

examiner in the schoolyard, under natural light, with the aid of a spatula and wooden toothpick without previous drying; **2<sup>nd</sup> step (30 days later)** – Oral health questionnaires constituted of 10 closed questions were applied, in which nine questions had three response options and the last one had four options. These questionnaires were applied during the first, second and last meetings; **3<sup>rd</sup> step (60 days later)** – In the computers in the computer lab were installed programs containing appropriate habits for oral health maintenance, including diet, brushing and flossing; **4<sup>th</sup> step** – The students were split into groups of 10 people to participate in educational-preventive activities in oral health via Distance Learning, oriented by an advisor (the principal author); and **5<sup>th</sup> step** – The students received a toothbrush, toothpaste with fluoride and dental floss to use in the supervised brushing.

In the actual study was calculated: a) arithmetic mean, standard deviation, median, minimum and maximum of continuous variable (e.g. % of plaque); b) distributions of simple frequencies and percentages of discrete variable (e.g. extent of plaque acceptance); c) the non-parametric test Kruskal-Wallis, comparing plaque and bleeding percentage regarding the 4 encounters; d) the non-parametric  $\chi^2$  (chi-squared) test comparing the 4 encounters regarding the extent of plaque and bleeding acceptance; and e) the non-parametric  $\chi^2$  (chi-squared) test comparing the 4 encounters regarding the questionnaires. The SPSS Software, version 17.0, used to perform the work. According to Campos (1983)<sup>1</sup>, the significance level adopted was 5% of probability ( $p \leq 0.050$ ).

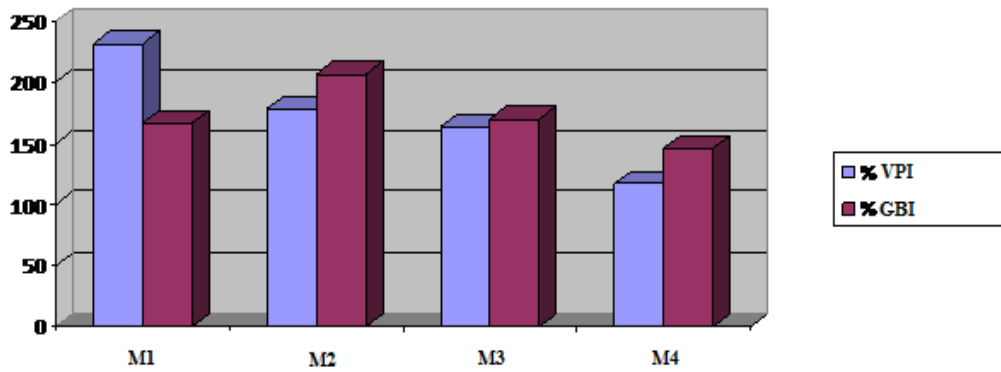
### 3 RESULTS

Among the 113 participant children in the initial sample, 27 children (23.9%) were transferred to another school, left the studies or was missing during one or more meetings, resulting in a final sample with 86 students. One of these 86 children that

participated in the oral exam didn't complete the questionnaire, as a result, only 85 children answered the questionnaire. Mostly of students were around 10 or 11 years old. Related to the gender, 48.2% (41) were female and 51.8% (44) were male students.

It was noted there were a statistically significant 1% difference regarding the percentage of biofilm and the percentage of bleeding. This difference happened in the steps 1 and 2, 1 and 3, 1 and 4, 2 and 4, and 3 and 4. Regarding the percentage of bleeding, the difference was in the moments 1 and 2, 2 and 3, and 2 and 4 (Figure 1).

**Figure 1:** Comparison of plaque percentage and bleeding percentage in the four moments.



The comparison between the answers behavior and the questionnaires' questions during the three moments happened using the non-parametric  $X^a$  (chi-squared) test. The right answers to each question are in red. In conclusion, most of the questions in this analysis were not statistically significant, except the question six that were 5% different regarding the distributing of answers frequency (Table 1).

**Table 1:** Simple frequency distributions of Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9 and Q10 in relation to the three moments of the questionnaire, non-parametric X<sup>2</sup> test (ChiSquare) and their significance.

Question	Moment			Total	Asymp.Sig.(2-sided)
	M1	M2	M3		
Q1	24	30	17	71	0,145
	44	38	54	136	
	17	17	14	48	
	57	56	67	180	
Q2	18	17	13	48	0,288
	10	12	5	27	
	8	6	6	20	
Q3	3	2	3	8	0,950
	74	77	76	227	
	22	20	10	52	
Q4	13	16	10	39	0,059
	50	49	65	164	
	12	9	10	31	
Q5	58	64	66	188	0,644
	15	12	9	36	
	16	13	11	40	
Q6	57	63	55	175	0,24
	12	9	19	40	
	71	78	75	224	
Q7	9	4	6	19	0,587
	5	3	4	12	
	13	7	9	29	
Q8	10	9	12	31	0,6
	62	69	64	195	
	63	58	63	184	
Q9	11	13	11	35	0,910
	11	14	11	36	
	28	20	17	65	
Q10	34	36	43	113	0,496
	4	5	6	15	

#### 4 DISCUSSION

The results in this research showed that the students that participated in the Web learning activities, in this 5-month period, demonstrated better hygienic oral habits proven by reduction of Visible Plaque Index and Gingival Bleeding Index. The Visible Plaque Index demonstrates the current situation of oral hygiene, while the Gingival Bleeding Index represents the condition if the oral hygiene became constant, promoting the gingival health. A fact corroborated by several authors.<sup>2-8</sup>

Toassi and Petry (2002)<sup>9</sup>, during study about motivation and control of dental biofilm and gingival bleeding, obtained statistically significant differences among groups submitted to education programs related to Visible Plaque and Gingival Bleeding Indexes. In another study, Delfes (2004)<sup>10</sup> evaluated the influence of the education and guidance on oral health about the oral hygiene index in preschool children. In the group submitted to an educational program, a positive result was found out. In addition to these studies, there are others that had similar methodologies<sup>2-8</sup>, but that not used distance learning tools to promote the oral health. After the intervention using the Plaque Index, they also had obtained results statistically significant in reducing the dental biofilm, corroborating in the results presented in this study.

It is important to remember that the reduction of the Visible Plaque Index in this study was 50.67%, a little above that the systematic studies<sup>11,12</sup>, that in overall demonstrate up to 30% of improvement. Regarding the questionnaires' results, the highest number of right answers was at the study end, then it was possible to conclude that the students involved in the education activities achieved a higher level of knowledge about oral health.

Similar results were in the study developed by Biesbrock (2003)<sup>3</sup>, that compared the knowledge about oral health among children in the United States before and after the educative program for 5 months. Statistically significant differences ( $p < 0.05$ ) related to the information level on healthy habits were found out. These results confirmed the meta-analysis developed by Kay e Locker (1996)<sup>11</sup>, which explains that oral health education is more positive and more effective on levels of knowledge. On the other hand, the study by Tomita et. al. (2001)<sup>13</sup> that measured, through Spearman's rank correlation coefficient, the relationship between the Plaque Index and the theoretical knowledge didn't obtain a statistically and significant result. The same contradictory fact was at the research by Aquilante et.al. (2003)<sup>14</sup>, which concluded the knowledge is not always a change during the action. According to these authors, the individual motivation is necessary for not only the cognitive but also the emotional aspect.

The motivation is a major topic because it affects hygiene habits. The biggest motivation promoters are the external interferences such as the culture, the environment where they live, parenting education, everything that can define the children's habits. Perhaps, the use of the Web itself has been the differential incentive factor in this study if I compare with the other studies. In addition, the participants generated better results

during the educational activities on Oral Health in the school environment, because of the parental participation regarding their children education.

According to Guimarães (2003)<sup>15</sup>, the snack time in the public schools must be related to other activities, because the food quality influences both in the Oral Health and in the ease in acquiring knowledge. Frota et.al (2009)<sup>16</sup> agree with this position in his study in a public school at Fortaleza, CE (Brazil), that was a data collection comparing the malnourished or food-deficient children data to their school performance. Then, it was possible to conclude that these children have difficulty of assimilating and of concentrating, it compromises the school performance. Then, the importance about healthy habits is reaffirmed.

Therefore, the strategy of insertion Distance Learning (DL) in the health area could be part of this broad context to promote the full quality of life. This strategy takes the quality knowledge to a large contingent, this fact was confirmed by Klozovski<sup>9</sup>, that concluded that DL leads to a more positive perception and satisfaction when compared to the traditional or classroom education. These research results were unanimously corroborated by several authors<sup>2-7</sup> that drove the health education not only as a social practice but also as a politics of empowerment and co-responsibility for individuals' and groups' health, through the health education, promoting the citizenship.

## 5 CONCLUSIONS

The educational activity via Web was able to improve oral hygiene through behavior change, reflected by VPI and GBI, as well as the level of knowledge regarding Oral Health. Direct contact with new communication technologies can spark interest in a fairer education that can be available to all and for all.



## REFERENCES

1. Albadar JM, Buischi YAP, Mayer MPA et. Al. Long-Term effect of two preventive programs on the incidence on plaque and gengivits in adolescents. *J.Periodontal* 1994;8(2):278-284.
2. Aquilante AG, Almeida BS, Martins de Castro RF, Xavier CRG, Sales Peres SHC, Bastos JRM. A importância da educação em saúde bucal para pré escolares. *Ver. de Odontologia da UNESP*.2003;32(1):39-45.
3. Biesbrock AR, Walters PA, Bartizek RD. Initial impact of a national dental education program on the oral health and dental knowledge of children. *The Journal of Contemporary Dental Praticce*. 2003 mai; 4 (2):1-7.
4. Campos H. *Estatística experimental não-paramétrica*, 3ªedição, ESALQ, USP, São Paulo:1983, p.349.
5. Conrado CA, Maciel SM, Oliveira MR. Efeito de um programa educacional direto relacionado com a saúde bucal de escolares do município de Maringá, PR. *Odontol. Clin*. 1997;7:21-30
6. Delfes RA. *Influência da educação e orientação em saúde bucal sobre o índice de higiene oral em pré escolares da Escola Municipal Arlindo Andretta Bolombo- PR [dissertação de mestrado]*. Curitiba: Universidade Federal do Paraná;2004.
7. Frota MA, Pesco EG, Bezerra MDM, Martins MC. Má alimentação: fatores que influenciam na aprendizagem de crianças de uma escola pública- *Revista de APS* 2009; 12 (3): 278-284.
8. Guimarães GRA. *Promoção de saúde na escola: a saúde bucal como objeto de saber. [dissertação de mestrado]*. Rio de Janeiro: Escola Nacional de Saúde Pública da Fundação Osvaldo Cruz; 2003.
9. Klozavski ML. *Um estudo comparativo entre estudantes do ensino presencial e do ensino a distância sobre percepção de valor e satisfação na disciplina de contabilidade geral [Dissertação de mestrado]*. Curitiba: Universidade Federal do Paraná; 2013.
10. Leal SC, Bezerra ACB, Toledo OA. Effectiveness of teaching methods for toothbrushing in preschool children. *Braz. Dent. J*.2002;13(2):133-6.
11. Navarro RS, Esteves GV, Youssef MN. Estudo clínico do comportamento de escolares mediante escovação supervisionada e motivação no controle de placa bacteriana. *Rev. Odontol.Univ. São Paulo*.1996 abr/jun: 10 (2):153-6.
12. Perin PCP, Garbin AJI, Perin LFMG, Pereira MA, Abreu KCS, Percepção e condição de saúde bucal em crianças numa instituição na cidade de Lins/SP. *Rev. Fac. Odontol.Lins*. 2004.16(2):33-8.
13. Silveira EG, Silva RHH, Almeida ICS. Avaliação de uma metodologia para um programa educativo preventivo em saúde bucal para escolares. *Revista Paulista de Odontologia*.1998 mar/abr;2: 22-7.
14. Toassi RFC, Petri PC. Motivação no controle do biofilme dental e sangramento gengival em escolares *Rev. de Saúde Pública*.2002.36(5):634-7.
15. Tomita NE, Pernanbuco RA, Lauris JRP, Lopes ES. Educação em Saúde Bucal para adolescentes: uso de métodos participativos. *Rev. FOB*. 2001 Jan./Jun; 9(1/2):63-9.
16. Watt RG, Marinho VC. Does oral heshth promotion improve oral hygiene and gingival health? *Periodontol* 2000. 2005; 37:35-47.