Pesquisa Brasileira em Odontopediatria e Clínica Integrada
ISSN: 1519-0501
apesb@terra.com.br
Universidade Federal da Paraíba
Brasil

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Pesquisa Brasileira em Odontopediatria e Clínica Integrada, vol. 14, núm. 2, 2014, pp. 115-128
Universidade Federal da Paraíba
Paraíba, Brasil

Brazilian Research in Pediatric Dentistry and Integrated Clinic 2014, 14(2):115-128
DOI: http://dx.doi.org/10.4034/PBOCI.2014.142.06
ISSN 1519-0501

Original Article

Dental Health Knowledge and Attitudes of Primary School Teachers Toward Dental Health Education in Maceió, Brazil

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Academic Editors: Alessandro Leite Cavalcanti e Wilton Wilney Nascimento Padilha

Received: 04 September 2013 / Accepted: 26 March 2014 / Published: 10 June 2014

Abstract

Objective: To evaluate the levels of knowledge and attitudes toward oral health of preschool teachers of Maceió, Alagoas. **Material and Methods:** Cross-sectional study using a pretested structured questionnaire (32 teachers equivalent to 20% of the sample) applied to 140 teachers of Child Day Care Centers of Maceió. To assess the level of information of survey participants (dependent variable), frequency from 0 to 49.99% of correct answers of questions proposed was considered unsatisfactory knowledge; 50 to 70% as reasonable knowledge and above 70% as satisfactory knowledge. Independent variables were age, sex, educational level, marital status and children. Data analysis was performed using SPSS software 17.0 and presented as descriptive statistics and Logistic Regression ($p < 0.05\%$). **Results:** The level of knowledge of teachers on the etiology of caries was unsatisfactory, because although 90% reported that sugar is responsible for the decay process, only 3.6% reported that its excessive consumption is the responsible for the emergence of the disease; the level of knowledge for periodontal disease was unsatisfactory, since only 32.1% correctly answered the meaning of plaque. Teachers over 40 years and with children are more likely to have satisfactory knowledge regarding oral health and 88.6% of these professionals have already conducted some activity related to the theme. **Conclusion:** Although most teachers have done oral health activities, the level of knowledge of teachers about the etiology of caries and periodontal disease was considered unsatisfactory, therefore further clarification in oral health is need so that teachers could act as agents in oral health promotion.

Keywords: Faculty; Oral health; Child day care centers; Dental caries.

Introduction

In recent years, dentistry has advanced significantly with regard to technical and scientific knowledge and prevention, although a large portion of the population is still being affected by caries and periodontal disease [1].

In order to produce information on the oral health status of the Brazilian population and support the planning and assessment of actions in this area in different levels of management of the Unified Health System, the Ministry of Health created the SB Brasil Project. Its first edition in 2003 made one of the most complete diagnostics of the oral health of Brazilians and showed that about 27% of children aged 18-36 months had at least one primary tooth with caries experience, and the proportion reached nearly 60% of children aged 5 years, with a mean of 2.8 affected teeth [2]. Recently, in 2010, a new epidemiological survey was performed and it was observed that special attention should be given to the primary dentition, since the attack of caries in children aged 5 years included on average 2.43 teeth, a reduction of only 13.9% in 7 years, and the northern and northeastern regions of Brazil are the most affected [3].

In this sense, there is a high prevalence of dental caries among children aged 0-36 months [4]; however, most dental services have emphasized dental treatment of school children aged 6-12 years, prioritizing care during eruption of the first permanent molar teeth, leaving a gap in dental treatment at the age group of preschoolers [3], where little attention is given, and therefore leaving aside what could be avoided, i.e., to interpose barriers to the natural history of the disease with prevention and health promotion actions [5].

Given this history of dental care evolution, health education is considered an important field of knowledge and practices to promote people's autonomy. Thus, the education sector can play an important role in the solidification of actions aimed at strengthening the capacity of individuals to maintain health, creating healthy environments and the consolidation of policies focused on quality of life. From this perspective, the Ministry of Health has imposed the need for systematizing intersectoral proposals between health and education sectors [6], thus integrating the knowledge of these two fields, since educational methods and the health / disease process include both awareness and autonomy and the need for collective and participative actions, taking into account the reconstruction of knowledge in school and the continued training of teachers [7].

Starting from the premise that every student, teacher and school environment are systematically cornerstones in achieving oral health, the Ministry of Education and Sports (1998) established the national curriculum standards for basic education, in which health is seen as a cross-cutting issue to be debated and responsibly taken in the school as a whole (8), and subsequently, in 2007, the School Health Programme (PSE) was established, in which Item 4 states: "Health actions will consider attention, promotion and care and will be developed in combination with the public basic education network in accordance with the principles of the Unified Health System (SUS), which can implement actions such as "Assessment of health and oral hygiene" [9].

Thus, the concept of Health Promoting Schools was created through the Global School Health Initiative launched by the World Health Organization (WHO), which must constantly strengthen their capacity to provide the means to guarantee life, work and learning through intersectional practices between health and education [10].

Early childhood education environments such as child day care centers, if properly organized, represent an educational environment complementary to the family, which promotes physical, cognitive and emotional development of the child, also favoring the acquisition of healthy behaviors, helping the child to establish healthy habits in adulthood [8]. In particular, preschool teachers play an important role due to their social function and potential for the development of a systematic and continuous work with a child population, acting as multipliers and actively contributing to health promotion [11].

Factors such as lack of resources, time and inability to incorporate oral health into the curriculum of these teachers have been identified as barriers to oral health education in schools. The lack of adequate training of teachers can be a significant barrier to the success of school health promotion programs, which can in fact result in adverse effects on the health of students [12].

Upon the foregoing, we realized the need to assess, through a questionnaire, the level of knowledge and attitudes toward oral health of preschool teachers of child day care centers of Maceió, Alagoas, Brazil. The aim of the questionnaires was to identify what are the specific needs related to the theme, as well as to propose the possibility of implementing actions along with the Department of Education to train these teachers.

Material and Methods

This is an observational, cross-sectional and analytical study having as independent variables: age, sex, educational level, marital status and children, and as dependent variable the level of knowledge. The study was submitted to the Ethics Committee for research involving humans of the Cesmac University Center, receiving approval under protocol No. 1585/12.

The city of Maceió where this study was conducted is the capital of the state of Alagoas, northeastern Brazil, with length of 516.46 Km. According to the last IBGE census, its population is 932,748 inhabitants and has one of the worst Human Development Indexes of Brazil, with average of 0,721, according to the latest data from the United Nations Program for Development.

The survey was conducted from January to March 2013 in all 21 daycare centers in the city of Maceió, AL. All teachers of municipal daycare centers were considered eligible for the study, excluding those who were in the exercise of other functions such as coordination, board, i.e., those who were not directly working with students and those who refused to sign the free and informed consent form after receiving information about the research objectives.

Data were collected by a researcher individually in the school environment applying a self-administered structured questionnaire adapted based on questionnaires used in previous studies [13,14].

Within a universe of 192 teachers and considering an expected acceptance proportion of 30%, error of 20% and confidence level of 99%, a sampling of 160 participants was calculated.

The collection instrument was pre-tested in a pilot study with 20% of the sample (32 teachers) in order to assess the participants' understanding regarding the questions, and subsequently, some adjustments were made in the questionnaire.

To assess the level of information of respondents, frequency from 0 to 49.99% of correct answers of questions proposed was considered unsatisfactory knowledge; 50 to 70% as reasonable knowledge and above 70% as satisfactory knowledge [13].

The results were processed in a database and analyzed using SPSS software version 17.0. In all analyses, significance level of 0.05 was considered. The presentation was performed by descriptive statistical technique with frequency distribution. Logistic regression analysis was performed in order to verify the sociodemographic factors that could be related to the level of knowledge of teachers. Association tests using the chi-square were performed, in which independent variables were age, sex, educational level, marital status and children. Logistic regression analysis with entry of each variable separately was performed according to the decreasing level of statistical significance obtained in the association analysis. Variables whose p-value was less than 0.05 (Wald test) were considered significant in the model. Risk, odds ratio (OR) and 95% confidence intervals were estimated. The statistical significance of the model was verified using the likelihood ratio test and model fit was assessed using the Hosmer & Lemeshow test.

Results

Of a total of 160 teachers of child day care centers of Maceió, 20 refused to sign the consent form or were unable to participate; thus 140 teachers were included in the survey.

Figure 1 shows the mean age of teachers. It was observed that the predominant age group was 40-49 years (44.3%) and most individuals were female.

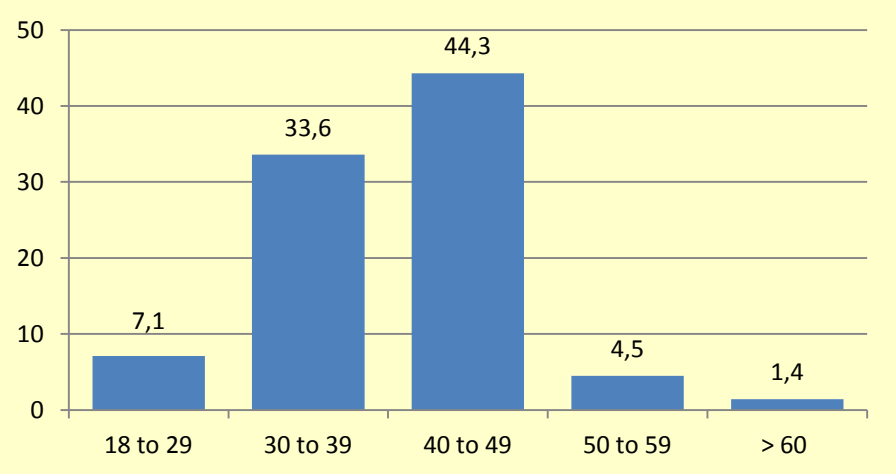

Figure 1. Distribution of teachers according to age.

Figure 2 shows that most participants have higher education and post-graduation, with 41.4% and 50.7%, respectively. Most of these professionals are married (52.9%) (Figure 3) and 42.1% have children under the age of 14 years (Figure 4).

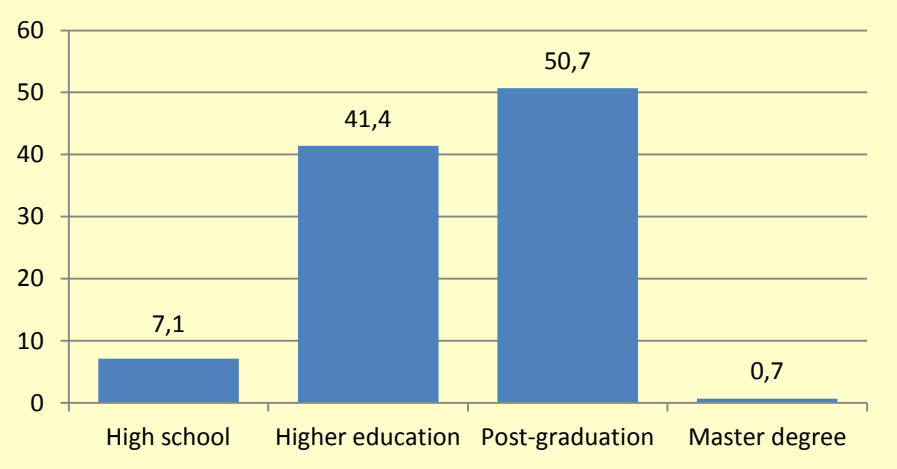

Figure 2. Distribution of teachers according to educational level.

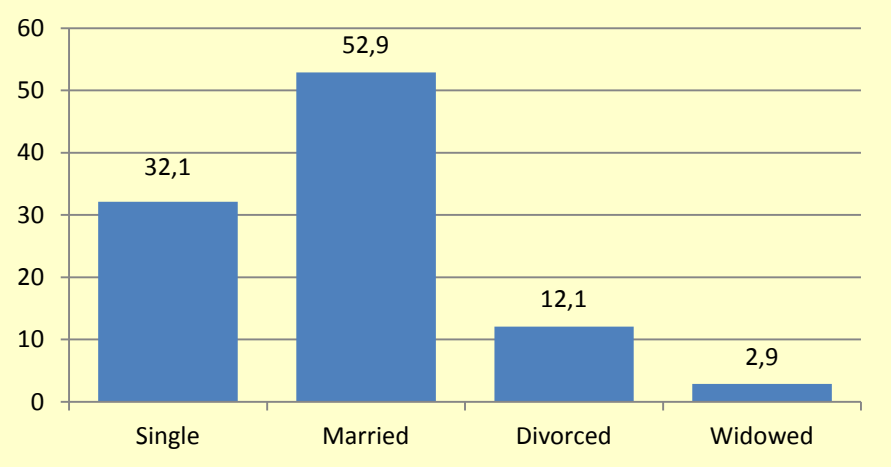

Figure 3. Distribution of teachers according to marital status.

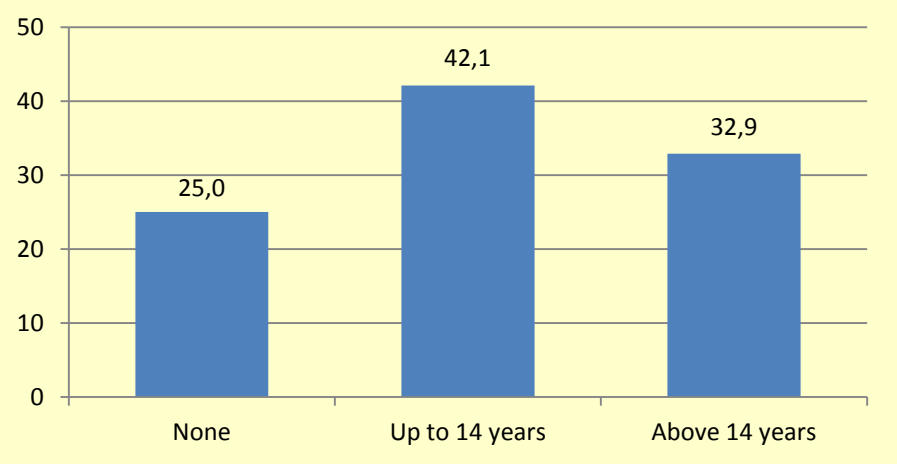

Figure 4. Distribution of teachers according to the age of children.

The main source of information on oral health was the dentist with 30.7%, followed by the school with 22.9%, family with 18.6%, others with 14.3% and television with 13.5% (Figure 5).

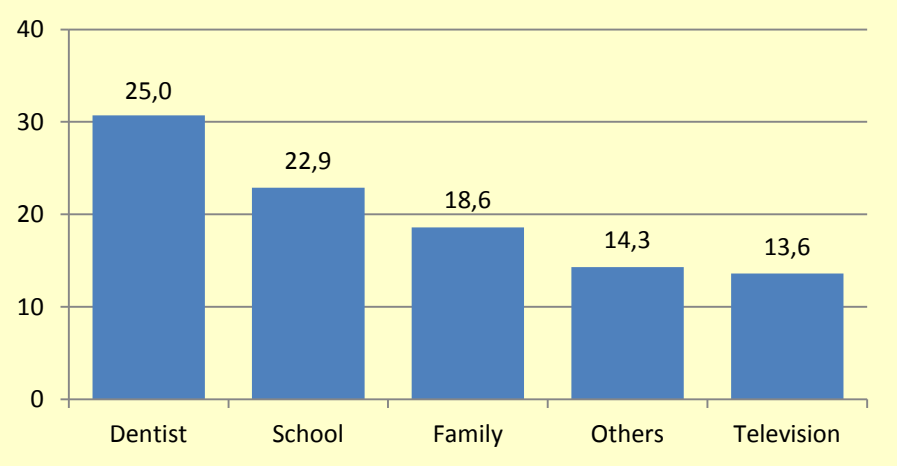

Figure 5. Distribution of teachers according to the main source of information on oral health.

This research revealed that teachers had unsatisfactory level of knowledge about the etiology of caries, since although 90% reported sugar as responsible for the caries process, only 3.6% reported that its excessive consumption is the responsible for the emergence of the disease, as well as insufficient knowledge regarding periodontal disease, since only 32.1% and 21.4% correctly answered the meaning of plaque and its removal, respectively (Table 1).

Table 1. Distribution of teachers according to the levels of knowledge on caries and periodontal disease, Maceio, 2013.

Questions	n	%
Which foods are directly related to the onset of dental caries?		
Fruits and vegetables	0	0
Sugars	126	90.0
Carbohydrates	1	0.7
The three alternatives	13	9.3
What is plaque?		
Food residues on the tooth surface	22	15.7
Groups of bacteria on the tooth surface	45	32.1
Yellowish mass on the tooth surface	63	45.0
Do not know	10	7.1
How can plaque be removed?		
Through professional scraping	105	75.0
With the use of dental floss and brushes	30	21.4
With use of fluoride mouthwash	2	1.4
Do not know	3	2.1
When does gingivitis occur?		
Plaque accumulation occurs	107	76.4
The gum has a tendency to get the disease	20	14.3

No apparent reason	1	0.7
Do not know	12	8.6
When does tooth decay occur?		
Inadequate teeth brushing	80	57.1
Excess sugar consumption	5	3.6
The three alternatives are correct	54	38.6
Do not know	1	0.7
Is dental caries transmitted from one person to another?		
Yes	46	32.9
No	76	54.3
Do not know	18	12.9

With respect to level of knowledge of teachers about preventive dentistry, 97.1% stated that fluoride has the function of strengthening teeth against caries and 99.3% reported that the most important in brushing is the technique used, showing satisfactory knowledge on the subject (Table 2).

Table 2. Distribution of teachers according to levels of knowledge on preventive dentistry, Maceio, 2013.

Questions	n	%
How much toothpaste should be for brushing?		
Amount equivalent to a pea	102	72.9
Amount covering the entire toothbrush	22	15.7
Amount that will produce abundant foam	6	4.3
Do not know	10	7.1
What is the function of fluorine?		
Teeth whitening	4	2.9
Strengthening teeth against cavities	136	97.1
How should be the toothbrush used by the child?		
Large with soft bristles	1	0.7
Small with soft bristles	133	95.0
Do not know	6	4.3
Which is most important in tooth brushing?		
Force applied on the teeth	1	0.7
Technique used	139	99.3
In which product (s) fluoride can be found?		
Milk	3	2.1
Water	49	35.0
Foods	10	7.1
Toothpaste	134	95.7
Dentist	57	40.7
Others	6	4.3

In relation to the attitude of teachers toward oral health, 88.6% had performed some oral health-related activity in classroom, 77.9% lead their students to brush their teeth after meals, and 83.6% have guided parents to seek dental treatment to their children (Table 3).

Table 3. Distribution of teachers according to attitudes toward oral health, Maceio, 2013.

Questions	n	%
Has conducted activity related to oral health with students?		
Yes	124	88.6
No	15	10.7
Not applied	1	0.7
What time students should brush their teeth?		
After meals	109	77.9
Has no fixed schedule	12	8.6
Does not lead them to brush their teeth	19	13.6
Guidance on preventing dental caries in school phase is a task of:		
The dentist	1	0.7
Teachers with the help of the dentist	59	42.1
Other	1	0.7
All of the above	79	56.4
Have you advised parents to seek dental treatment to their children?		
Yes	117	83.6
No	22	15.7
Do not know	1	0.7
Find important to have guidance on educational and preventive measures to promote oral health of students?		
Yes	139	99.3
No	1	0.7
Do you think it is important students to be educated at school about oral health?		
Yes, provided it is done by the dentist	2	1.4
Yes, provided it is done by properly trained teachers	6	4.3
Yes, provided it is done in partnership among faculty, staff, family and dentist	132	94.3
Would you like to assist the dentist in intra- and extra-class activities for the prevention of dental caries?		
Yes	118	84.3
No	7	5
Do not know	15	10.7

Regarding oral health knowledge, teachers aged over 40 years are 71.2% more likely to have satisfactory knowledge regarding oral health than teachers aged below 40 years (Table 4).

Teachers who have children were three times more likely to have oral health knowledge in relation to those with no children (Table 5).

Table 4. Association between level of knowledge and sociodemographic factors.

Variable	Category	Level of knowledge		p-value*
		Satisfactory n (%)	Unsatisfactory n (%)	
Age	≥ 40 years	37 (71.2)	46 (52.9)	0.033
	< 40 years	15 (28.8)	41 (47.1)	
Sex	Male	0 (0.0)	1 (1.1)	-
	Female	52 (100.0)	87 (98.9)	
Educational level	Up to higher education	24 (46.2)	44 (50.0)	0.66
	Post-graduation	28 (53.8)	44 (50.0)	
Marital status	Married	33 (63.5)	41 (46.6)	0.05
	Not married	19 (36.5)	47 (53.4)	
Children	More than one children	45 (86.5)	60 (68.2)	0.01
	No children	7 (13.5)	28 (31.8)	
Total		**52 (37.4)**	**87 (62,6)**	

* P <0.05

Table 5. Factors associated with the level of knowledge according to the multiple logistic regression model.

Model [1]	Category	OR_{gross}(CI95%)[2]	$OR_{adjusted}$(CI95%)[2]	p-value[3]
Children	Yes	3.0 (1.2 – 7.5)	2.8 (1.1 – 7.2)	0.03
	No	1.0		
Age	≥ 40 years	2.2 (1.0 – 4.6)	2.0 (1.0 – 4.4)	0.06
	< 40 years	1.0		

1 Multiple logistic regression model, adjusted for educational level; Likelihood ratio test (model) with p = 0.015 and Hosmer & Lemeshow test p = 0.75; 2 CI 95%: Confidence interval of 95% for Odds Ratio (OR); 3 Wald Test.

Discussion

Oral hygiene in school is an important fact to be considered and it is hardly understood to produce knowledge and autonomy in relation to health care. In addition, teachers play an important role as auxiliary staff of dentists, especially in regions with limited number of professionals [15].

The characterization of the daily lives of teachers is critical to understanding the factors that affect their pedagogical work, the structure, the organization of schools and the learning conditions in their work. The universe of teachers studied was predominantly composed of females, being in agreement with other studies [1,13,16]. This predominance of women in the teaching profession can be explained by the historical process of inclusion of women in the labor market, where most of them entered the educational field, which activity was labeled as a continuation of domestic work, and teachers played the role of "mother/educator" [17].

In relation to the educational level, the majority of the surveyed teachers have college and graduate degrees, which was also observed in other studies [1,13], and can be attributed to the

implementation of the Law of Guidelines and Bases of National Education [18], which establishes that teachers must have higher education to work in basic education. This is achieved by full degree courses in universities and higher education institutes, accepted as minimum qualification for the practice of teaching in primary schools and in the first four grades of elementary school.

When analyzing the responses of questionnaires about the foods that are directly involved with tooth decay, satisfactory level of knowledge was found, where 90% of teachers reported sugar as the food directly related to caries, which results are similar results those found in previous studies [13,16] that reported sugar as the main food related to caries (81.5%, 93.7%, respectively). Campaigns of candy makers associating the consumption of their products to the demonstration of affection compete with great advantage over educational messages about oral health. This reality further enhances the direct responsibility of teachers as educators in relation to this issue. Therefore, government public health actions should be carried out in day care centers to determine priorities for nutrition education and oral health in early life in order to combat the factors that guide the etiology of the disease.

Regarding plaque (biofilm), great disinformation was observed, since most teachers could not respond what plaque / biofilm is. This result is in agreement with other studies that demonstrated a low level of knowledge of the group researched on the subject [13,15,19]. When using inadequate terms in an attempt to facilitate the understanding, with words like "food residues or dirt", dentists may be responsible for this misconception in the understanding of plaque.

The emergence of gingivitis is properly understood by most participants as the result of plaque accumulation, demonstrating a satisfactory knowledge on the topic, a factor also observed in a study carried out in municipal day care centers of João Pessoa, Brazil [13]. As for the removal and disorganization of this plaque (biofilm), only the correct use of toothbrush and floss is required, and 75% of teachers responded that professional scraping could also be performed, which was also observed in other studies [13,19,20]. This data reveal again a misconception about the removal of plaque and tartar, since the latter can only be removed by a qualified professional in a dental office. What is observed in relation to information obtained from surveys is that most campaigns on preventive oral health are focused on the prevention of dental caries, and periodontal disease is little mentioned. It is of paramount importance to warn the population that periodontal disease is as important as tooth caries and that there is risk of losing a tooth in function of periodontal disease, considering the rapid progression of the disease and limited resources to treat it [20].

In line with some studies found in literature [13,15,19,20,21], the present study showed that dentists occupy a prominent place as the main vehicle of information on oral health (Figure 5); therefore they should engage in health education process in schools, contributing to the training of teachers. In contrast, other studies showed that information leaflets, books and newspapers major sources of information on oral health [11,16].

In relation to the etiology of dental caries, the present study found a 38.6% unsatisfactory knowledge about multifactorial dental caries (poor oral hygiene associated with inadequate nutrition

and presence of bacteria) in agreement with literature [1,16,20]. In this regard, 57.1% of respondents reported that the etiology was related only to poor hygiene. Different results were found in other studies, where multifactorial dental caries was described as responsible for the onset of the tooth decay process [13,19].

As observed in some studies [13,16,19], the teacher is unaware of the transmissibility of dental caries, and in the present study, 54.3% reported that caries is not transmittable, thereby demonstrating unsatisfactory level of knowledge about this subject and the need to discuss these issues with teachers.

Regarding preventive dentistry focused on the amount of toothpaste used, what type of toothbrush is best for children and what is most important in brushing, 72.9% responded that the ideal amount of toothpaste is equivalent to a pea, 95% responded that the ideal toothbrush for children must have small head and soft bristles and 99.3% reported that the most important factor in brushing is the technique used, demonstrating satisfactory level of knowledge regarding prevention, although some studies have shown that a large amount of professional, 31.5% and 34%, respectively, still recommend using toothpaste in the longitudinal direction of the toothbrush and not in the cross-section direction, which may lead to fluorosis rather than prevention [13,19].

Fluoride acts to reduce the loss of tooth mineral during demineralization and promotes remineralization of areas affected by the caries process; in this study, the role of fluoride was understood by 97.1% of participants who correctly answered that the use this chemical element strengthens teeth against caries, which was also observed in other studies [1,13,15,16,19,20].

In relation to the access to fluorine, its presence in toothpastes was reported by 95.7% of teachers, demonstrating the influence of media in the general knowledge. However, it was observed that only 35% mentioned water as a source of fluoride, which was also observed in a study carried out with pedagogy students [19], where only 3% knew the effect of fluoridated water, this lack of knowledge may be due to the fact that many regions of Brazil are not supplied by fluoridated water, since the implementation of water fluoridation did not occur uniformly throughout the country. The method first became available in more economically developed regions, unrelated to the need context. The uneven distribution of this measure has created a framework of social injustice, increasing socioeconomic disparity in the prevalence of dental caries [22].

Brazil has experienced a considerable reduction in the prevalence of dental caries in regions where fluoridation of the public water supply was adopted, as observed in studies carried out in Belo Horizonte MG (44.6%), Campinas SP (57%), Barretos SP (55%) and Piracicaba SP (79%) [23]. Therefore, the dissemination of this vehicle is of fundamental importance, which is a simple, low-cost and effective method for wide reach of the population.

Regarding the attitudes of teachers toward oral health, some studies have shown that 71% and 63.3%, respectively, of teachers had never performed any activity related to oral health in classroom [14,15], which could be related to their insecurity to work with these contents, since most had not received information on the subject in their educational training. However, the opposite was

observed in this study, where 88.6% of these professionals had already conducted some activity related to the theme, in agreement with another study [21], which demonstrates that the inclusion of oral health in the curricular bases of the Ministry of Health has already shown significant effects.

This study showed that 77.9% of teachers lead their students to brush their teeth after meals; other studies showed daily brushing of 67.6% and 50% respectively [14,21]. This simple task could reduce the dental caries indexes and the school would be a multiplier along with the dentist in health actions, since the benefit of fluoride is not permanent and depends on frequent exposures in the oral cavity throughout life, so the effectiveness of toothpaste depends on the frequency of its use [24].

An authentic health education program should encourage the integration of subjects, knowledge and practices. The dentist should play an active role to encourage the adoption of new strategies and the ongoing training of these teachers [8]. In this study, 94.3% of teachers believe that their students should be educated in school by teachers with the help of the dentist, staff and family, in agreement with another study that reported the importance of the dentist providing preventive support to schoolchildren [15].

In the present study, 84.3% of teachers proposed to assist the dentist in their intra and extra-class activities, which demonstrates the availability of teachers in promoting oral health, and if well grounded in evidence and well trained, the teacher might well be used as a multiplier agent in health.

This study found that there was no significance in relation to the educational level of teachers in relation to knowledge on oral health, which is in agreement with another study [15]; however, there was significance in relation to age, where teachers above 40 years were 2.2 times more likely to have more knowledge on oral health compared with younger ones; this result contrasts with the study conducted in India [25], where younger teachers demonstrated greater knowledge, which is justified by the fact that younger generations have gained greater sense of responsibility toward the prevention of oral diseases.

The search technique presented here, using a questionnaire, aimed to assess the understanding about attitudes and knowledge on oral health of a particular group of teachers. This methodology is feasible, easy and simple to perform, helping to identify factors that deserve further investigation. It must be considered that the opinions and inferences are particular of individuals interviewed in this research, and therefore should be compared to teachers working in the same education universe.

Conclusion

Teachers showed poor knowledge on the etiology of caries and periodontal disease, so there is a need for further clarification and training in oral health, evidencing the need to include more specific activities in the academic curriculum in order to provide greater integration between these professionals and the dentist, helping to control and prevent these diseases.

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