

# KNOWLEDGE OF UNDERGRADUATES IN DENTISTRY ABOUT TOOTH BRUSHING TECHNIQUES

## ABSTRACT

**AIM:** This cross-sectional study aimed to determine whether undergraduates in dentistry identify correctly the Bass, Scrub, Modified Stillman, Chartes, Roll and Fones brushing techniques, as well as determine which techniques are more properly identified and which have a lower rate of recognition. **MATERIAL AND METHODS:** The sample consisted of undergraduates of the 9th and 10th periods over the year of 2010/02 and the 9th period of the 2011/01 year of the Dentistry course of Higher Education Institution (HEI), who answered a questionnaire on a sequence of videos about tooth brushing. The collected data were tabulated in Microsoft Excel™ spreadsheet and subsequently analyzed using descriptive statistics. **RESULTS:** When evaluating all the techniques, the number of all hits had a percentage 61%, before a frequency of 39% errors. **CONCLUSION:** Even with the higher percentage of accuracy that the error, it is possible conclude that there is a need for strengthening the control and evaluation functions on recognition of tooth brushing techniques by dentistry undergraduate students of the HEI.

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## KEYWORDS

Dental plaque. Education. Periodontics.

## INTRODUCTION

Periodontal diseases have universal character and represent a serious dentistry public health problem in poor and developed countries. In Brazil, specifically the periodontitis constitutes the second buccal disease of interest in public health, preceded only by caries.<sup>1</sup>

The evolution of these two diseases is great responsible by most dental loss<sup>2</sup>. Both of them, periodontal disease and caries have as main etiological factor the presence of dental biofilm accumulation<sup>3</sup>. The main key for prevention of periodontal diseases and caries is the regular control of dental biofilm<sup>4</sup> by mechanical or chemical methods, or their association.<sup>5-7</sup>

It is known that the mechanical control of dental biofilm should not be replaced by exclusive use of chemical substances, unless the patient is unable to use mechanical means. This is the basic procedure for the practical dentistry, once without dental biofilm control the health cannot be achieved and/or preserved, not ensuring the effectiveness of future restorative procedures<sup>8</sup>. Therefore, the dental health professional should have concern on motivate his/her patients to perform mechanical control, making them conscious cooperators on the importance of tooth brushing.<sup>9</sup>

The shortage of buccal health education in Brazil is registered in the literature. Data

obtained in a study performed with 141 schoolchildren with age between six and ten years old presented that preventive measures have to be taken, because 83.6% never have received instructions about carrying out tooth brushing and 3.5% of children do not have dental brush.<sup>10</sup>

Oral health promotion can and should be performed further the limits of dentistry office. It enables that precepts of philosophy of health promotion can be really applied<sup>11</sup>. Resources as direct orientations on the tooth brushing techniques and the use of dental floss with help of macro models and macro tooth brushes should be use to motivate schoolchildren to daily tooth brushing practice<sup>12</sup>.

Hence, it is understood that Brazilian Universities should training, among other aspects, a dentist able to be a multiplier of knowledge and a health promoter. To investigate this goal, it is possible apply a logical reasoning of common sense: to teach (be a multiplier) is necessary firstly knowing how to do.

On the exposed, this work had as the purpose verify whether dentistry undergraduates identify properly the tooth brushing techniques, as well as determinate which technique is the more correctly identified and which one has lower recognizing index.

## MATERIAL AND METHODS

This cross-sectional study type cohort was approved by the Ethics Committee for Research (ECR) of Cesmac University Center under the protocol number 1001\2010, whose sample investigated was composed by graduates of 9th and 10th periods over the year 2012/02 and of 9<sup>th</sup> period over the year 2010/01 of Dentistry faculty in a Higher Education Institution (HEI), independent on the gender, race or social condition.

Those who did not want in free and spontaneous to participate on the research and/or those who was enable temporary or definitely for any physical condition (e.g.: use of gypsum in the dominant hand) or psychical (e.g.: panic disorder, reported anxiety by the subject) to answer the questionnaire proposed in the study were not included.

Each subject was invited to participate on the research and it was explained the aim(s), risk(s) and benefit(s) of the present study, as well as the doubts about it were clarified. Only after reading and signature of the written informed consent (WIC) the subject was considered included in the study.

The WIC was followed by an answer sheet that does not have any personal identification data about the subject, hence preserving the moral integrity and confidentiality of participant.

Right after the signature of WIC the subject separated it from the answer sheet and

next deposited the WIC inside a first box (sealed cardboard box) identified by the Arabic number one.

From this moment and with the answer sheet in their hands, in an environment that preserved his/her identity and secrecy (classroom), the subject had before him/her a ball-point pen and a computer with a sequence of videos about tooth brushing techniques (known only by the researcher) numbered from 1 to 6 on the left superior corner of video: (1) Bass, (2) *Scrub*, (3) Stillman Modified, (4) Chartes, (5) Roll and (6) Fones. We highlight that, in this environment, further the subject, there was only another person (one of the researchers).

Hereupon, the researcher stood with his/her back to the subject. His/her presence was due to these two aspects: (1st) to start the answers the subject was asked if on the computer the video number one was turned on - in an affirmative answer, the process proposed begun - and in a negative one, the researcher were going to towards the computer to correct the sequence of videos; (2nd) whether there was any problem with the videos, the researcher were going to the computer to solve it.

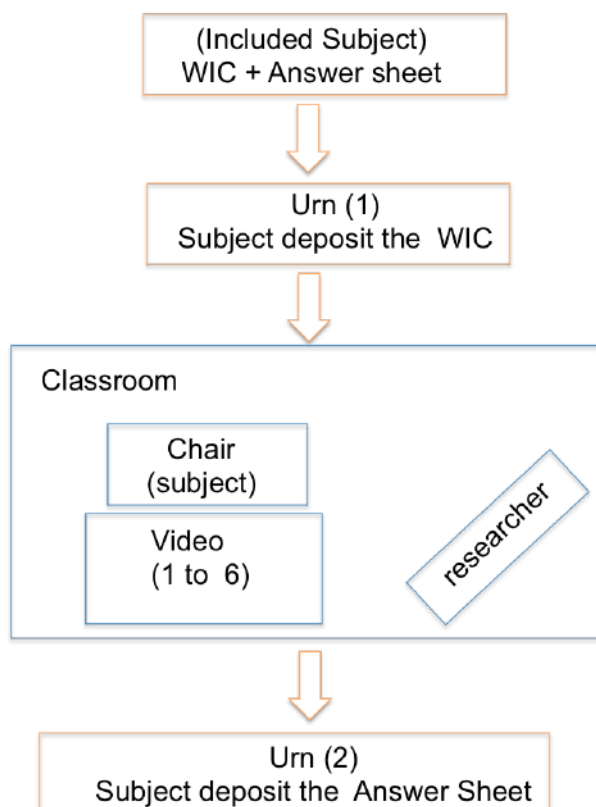
The subject had available the time wanted to pass from one video to another; however, it was not allowed return the video after watch it. This process was controlled by the computer.

For each video watched, the subject wrote down unabbreviated on the answer sheet, which technique he/she believed corresponding to. We highlight that erasures were not allowed. Those that presented erasures were automatically excluded from the sample in the moment of the analysis for collection, tabulation and data statistical analysis.

When concluding the fill of the answer sheet, each subject deposited it inside a second urn (different from the WIC), and it was opened only after the inclusion of all the individuals.

For better understanding, the lineation proposed and executed in this study follows below an illustrative organogram (figure 1).

Figure 1. Proposed procedure Organogram.



The data collected were tabulated in *Microsoft Excel™* spreadsheet version 2007, and next all the data were analyzed by descriptive statistic.

## RESULTS

The total number of graduates who could participate on the research was 136, respectively 46 and 41 from 9<sup>th</sup> and 10<sup>th</sup> periods 2010/2 and 49 from 9<sup>th</sup> period 2011/1. From the total number, 128 (94%) were included and 8 (6%) were not because of the following reasons: 3 of them were absent the days when the data were collected; 4 refused participate alleging lack of time to answer the questionnaire; and 1 was the researcher.

The table 1 evidences percentages of errors and hits, independently on the tooth brushing technique, where 768 answers were obtained. From this total, 296 (39%) were errors and 472 (61%) were hits.

The table 2 expresses the errors and hits considering separately the tooth brushing techniques. It is possible observe, among these techniques, that only Roll presented the higher error percentage (73%) regarding to the hits (27%).

## DISCUSSION

As the work performed by Batista et al.<sup>13</sup> (1999), the percentage of subjects included

in this research was higher than 50% from the total possible sample, what becomes this sample significant according to that author.

Hafajee et al<sup>12</sup> (2001) observed that, further the accumulation of biofilm generated by lack of brushing, an inappropriate tooth

brushing technique also has the potential to produce damage to hard and soft tissues inside the mouth.

Table 1. Comparison of percentages of errors and hits, independent on the brushing technique.

|            | <b>ERROR</b> | <b>HIT</b> | <b>Total</b> |
|------------|--------------|------------|--------------|
| Quantity   | 296          | 472        | 768          |
| Percentage | 39%          | 61%        | 100%         |

Source: Research data.

Table 2. Comparison of percentages of errors and hits on the same brushing technique.

| <b>TECHNIQUE</b>  | <b>ERROR</b> | <b>HIT</b> |
|-------------------|--------------|------------|
| Bass              | 12%          | 88%        |
| Scrub             | 43%          | 57%        |
| Stillman modified | 34%          | 66%        |
| Charters          | 48%          | 52%        |
| Roll              | 73%          | 27%        |
| Fones             | 21%          | 79%        |

Source: Research data.

It is understood that oral health professional should firstly know the way how the patient controls mechanically the bacterial plaque and suggest changes only if: the technique were used inappropriately from the aspect of difficulty to be executed from the viewpoint of patient's motor coordination (even when motivated), or when despite the efficacy on biofilm removal there were need to correct wide and vigorous movements which could traumatize the tissues, according to suggested by Hafajee et al<sup>12</sup> (2001).

Therefore, the professional's final aim is not change the technique or the way how the patients brush their teeth, but guide them or implant the better way to perform the hygiene

for their cases.

According to the magazine Viva Saúde<sup>14</sup>, the numbers disclosed by the Health Ministry revel that 58% Brazilian do not use properly the tooth brush. It means at least six in each ten Brazilian ones, consumed the product in sporadic or inappropriate way.

According to Guedes Pinto<sup>15</sup> (2009), it is known that brushing quality is more important than frequency and there is not evidences based on the ideal frequency of tooth brushing to prevent oral diseases.

It is assumed that during the Dentistry course all the dentists learn how to identify different tooth brushing techniques and the

appropriate indication for every one of them. These professionals of health should, therefore, leave the faculty able to multiply safely these techniques for population.

Despite the lack of literature which evaluate specifically the recognition of tooth brushing techniques by graduates in Dentistry, the work presented by Carvalho<sup>16</sup> (2010) presents similar methodology to this research, allowing a comparison of some results, once that author investigated some techniques different from this research. While in this research the techniques Bass, Scrub, Stillman Modified, Charters, Roll and Fones were investigated, Carvalho<sup>16</sup> (2010) investigated Fones, Bass, Stillman, Charters, Bass Modified and Stillman Modified.

From the techniques in this study, Bass and Fones were the most correctly identified with hit frequency 88% and 79% respectively. Carvalho<sup>16</sup> (2010) observed as most identified the Fones with hit 74%, while Bass presented 63%.

We believe this hit percentage regarding to the error one is due to the Bass technique is much explored in classes and seminars in this educational institution, highlighting its importance mainly for patients with periodontal diseases. According to Bass<sup>17</sup> (1954), this technique, when performed correctly, promotes cleaning the gingival sulcus, further reduce the keratin in the sulcular epithelium.

Regarding to the hit index 79% of Fones technique, we believe it is due to this is one of the most trained for children by educators or pediatric dentist during the childhood and, therefore, most students learnt it during their childhood and did not forget. This hypothesis raised here search base on the assertive by Van Der Widjen and Hioe<sup>18</sup> (2005) when they declare that more than 75% of young adults still use the tooth brushing methods learnt during the childhood.

Another hypothesis that could justify the higher percentage of hits for Fones is because this technique is applied by children patients who look for services of pediatric dentistry in the educational institution, what makes the graduates practice it routinely. This hypothesis was also used by Carvalho<sup>16</sup> (2010) to justify the hit percentage found by him in his institution.

Stillman modified technique presented here the hit percentage 66%, while Carvalho<sup>16</sup> (2010) found 84% error. It maybe is due to this technique is one of the more explored in periodontics and integrated clinic disciplines, further Fones and Bass.

Roll and Charters techniques, in this work, presented higher error percentage, 73% and 48%, respectively. Carvalho<sup>16</sup> (2010) found the error percentage 84% about Charters technique.

As Carvalho<sup>16</sup> (2010), we believe that the high percentage error could occur due to

the graduates understand dentistry prevent educational methods are in the second importance level, when in fact, they should be priority.

The formation of this graduates' cognition of idea maybe occurs because during most time of clinical classes, procedures dedicated to curative and restorative therapies are occurring. Therefore, most times, procedures like periodontal surgeries, smaller oral surgeries and the patient's aesthetic in the foreground.

The importance of these procedures should not be disregarded, however, it important reminds that, to promote the success and longevity of each procedure performed, oral health maintenance must be established through tooth brushing and consequently dental biofilm control<sup>7</sup>.

According to Franchin et al.<sup>11</sup> (2006), the community credit to the dentist the responsibility on the means of caries prevention, among them the instruction on oral hygiene. Hence, identify high error indexes, both in this study and on that by Carvalho<sup>16</sup> (2010), about tooth brushing techniques seems to be something curious, and the society could feel it strange, because they credit this responsibility to the dentist.

Adding this, thought to the observation by Poyato-Ferrera et al.<sup>19</sup> (2003), when they assert that introduce a specific tooth brushing technique to the patient produces a superior

increase on the oral hygiene when compared to the improvement of usual practice of tooth brushing by Van Der Widjen and Hioe (2005)<sup>18</sup>.

Piotrowski et al.<sup>20</sup> (2001) observed in their study that 90% of population employ the "*personal tooth brushing method*", usually the popular scrubbing method. They also assert that the population maybe uses their "*personal method*" by lack of information in which the dentist should multiply, but always in the correct way.

In the study performed by Zielboz et al.<sup>21</sup> (2009), the authors affirm that, whether the instruction on the buccal hygiene is correctly carried out, there is no significant difference if it was taught (multiplied) in individual or collective way.

When evaluate all the techniques investigated in this study in a total way, the number of hits was higher than the error ones. The errors percentage was 39 % and the hits one was 61%. In other words, recognition of tooth brushing techniques overcomes the non-recognition index.

Scrub technique, in this study, presented a percentage error 43%, an appreciable error, despite the higher frequency of hits (57%). This quantity of errors, for a so usual technique in which refers to a tooth brushing model based on a simple movement of "smear" and/or "come and go" generates the necessity of reflection on possible limitations

of the methodology employed. It can occur that the public investigated could remember visually the techniques, knowing their indications and only do not remember their names, than provoking the error indexes considered elevated for the specific sample.

In this way, we understand the need of new studies with different methodologies from those employed here, or improved, that enable the exclusion of probable biases.

### CONCLUSION

This study allows conclude that there is necessity to reinforce the recognition of tooth brushing techniques to the Dentistry graduates of the Higher Education Institution investigated. The tooth brushing technique with higher index hits was Bass and Fones, while the lower indexes of recognition were Roll and Charters.

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