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RESEARCH ARTICLE

AWARENESS OF BRUSHING TECHNIQUES AMONG PATIENTS - A HOSPITAL BASED STUDY IN A SUBURBAN POPULATION IN SOUTH INDIA

***Jerusha Santa Packyanathan and Reema Lakshmanan**

Department of Periodontics, Saveetha Dental College, 162, Poonamalle High Road, Ch – 77

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ABSTRACT

Background: Good oral hygiene and the use of appropriate brushing technique is essential for the best of oral health. Bad oral hygiene is a conducive environment for dental caries, halitosis and a host of other dental problems. Good brushing techniques play an important role in the prevention of these problems.

Purpose: Aims to evaluate the knowledge of patients of their routine brushing technique that they routinely use, and aspects of their oral hygiene and practices. To spread awareness of various tooth brushing techniques and their suitability in various oral conditions.

Methods and Materials: Study subjects were recruited from a randomly selected patient population attending the outpatient department of a dental hospital. (n = 304). The patients who participated were from different socio-economic backgrounds, age, educational background, locations and included men and women. An informed verbal consent was obtained from the patients, to conduct the survey. The data collected was analyzed using Microsoft Excel (version 10) and tabulated along with explanatory visual charts with respect to the various parameters chosen.

Results: The study showed a need for increase of awareness correct brushing techniques. Socio-economic status and education also play a significant role in affecting oral hygiene measures.

Conclusion: There is a need to develop initiatives, patient educations programs targeting the lower socio-economic group and those groups of low literacy. It also shows the need for dentists to play a more dominant role in educating the general public on oral hygiene conditions.

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INTRODUCTION

As the saying goes "Be true to your teeth or they will be false to you", it's very important to take care of our natural dentition. It has been observed recently that patients visit a dentist with problems arising mostly due to improper oral hygiene and care. This sparked the question about the type of brushing techniques used, and also awareness of the duration and frequency of brushing among the patients. Dental plaque is considered as the possible causative agent of major dental diseases such as dental caries and periodontal disease (Smita *et al*., 2014). The main reason for regular and proper brushing is to prevent tooth decay and plaque build-up which can lead to gingivitis. There are several different brushing techniques because the need varies from patient to patient A wide range of brushing methods and habits was observed among patients. It was found in study by Albertsson *et al*. (2010) that sixty percent of the population did not brush systematically. There was also a significant correlation between observed brushing time and caries activity. The method of instructions in implementation of a brushing technique depends on the instructional strategy (Schlueter *et al*., 2010). Although we brush our teeth every day, we don't pay much attention to technique. It requires a conscious effort in order to gain maximum effect. Duration, type of brush and frequency are other factors that affect the effectiveness of oral hygiene. Many methods for brushing the teeth have been described and promoted as being efficient and effective. In the Bass Method the bristles are placed at the gingival margin, at an angle of 45 degrees to the long axis of the teeth (Figure 1). Gentle vibratory pressure, using short back and-forth motions are exerted without dislodging the tips of the bristles. This motion forces the bristle ends into the gingival sulcus area as well as partially into the interproximal embrasures. The same method is used to brush the lingual Surfaces. The Bass technique requires patience and correct placement of the toothbrush in many different positions to cover the full dentition. In the Modified Stillman Method (Hirschfeld, 1956; Stillman, 1932) the brush

Corresponding author: Jerusha Santa Packyanathan
Department of Periodontics, Saveetha Dental College, 162, Poonamalle High Road, Ch – 77

is placed with the bristle ends resting partly on the cervical portion of the teeth and partly on the adjacent gingival (Figure 2), at 45^0 degree apically to the long axis of the teeth. Then move the brush about 20 short back-and-forth strokes while simultaneously moving it coronally along the tooth surface. A soft or medium multi-tufted brush should be used with this technique to minimize trauma to the gingiva. To reach the lingual surfaces of the maxillary and mandibular incisors, the handle of the brush can be held in a vertical position. With this technique, the sides rather than the ends of the bristles do the work. The bristles tend not to penetrate into the gingival sulcus. The occlusal surfaces of molars and premolars are cleaned with the bristles placed perpendicular to the occlusal plane and penetrating into the grooves and interproximal embrasures. The modified Stillman method may be recommended for cleaning in areas with progressing gingival recession and root exposure to minimize abrasive tissue destruction. Charters Method (Charters, 1932) involves placement of a soft or medium multi-tufted brush on the teeth with the bristles pointed toward the crown at a 45 -degree angle to the long axis of the teeth. The sides of the bristles should be flexed against the gingival (Figure 3), and a back-and- forth vibratory motion used to brush. The technique was designed to gently massage the gingiva, so the bristle tips should not drag across the gingiva. The bristle tips should be placed in the pits and fissures, and short back- and-forth strokes clean the occlusal surface. The bristles are pressed against the sides of the teeth and gingiva. The brush is moved with short circular or back-and-forth strokes. This technique can be recommended for cleaning in areas of healing wounds after periodontal surgery (Fermin *et al*., 1996).

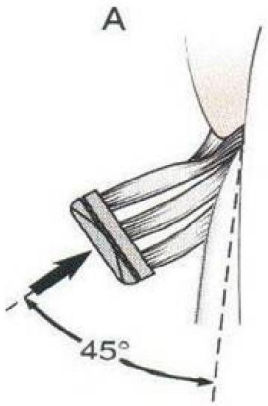


Figure 1.

Figure 2.

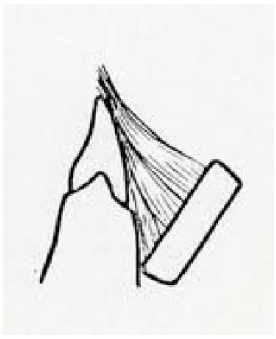
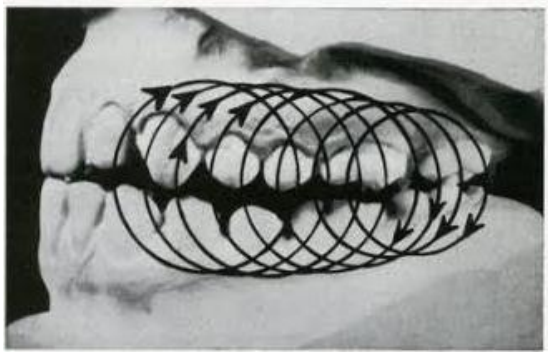


Figure 3.



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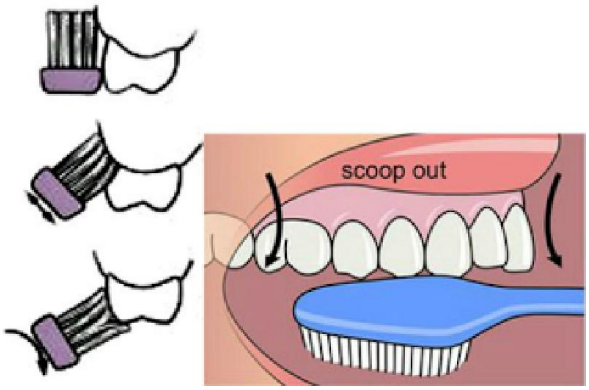


Figure 5.

The Roll's technique (Figure 4) seems to be the least effective perhaps because it generates only intermittent pressure against the teeth compared with the sustained force applied with sulcular and scrub technique (Bjorn and Lindhe, 1966). For children, The Fones technique is preferred since children do not have the manual dexterity for a more advanced technique. The Fones technique is a circular method where the teeth are clinched and the toothbrush is placed inside the cheeks. The toothbrush is moved in a circular method (Figure 5) over both the maxillary and mandibular teeth. In the anterior region, the teeth are placed in an edge-to-edge position and the circular motion is continued (http://www.dentalcare.com).

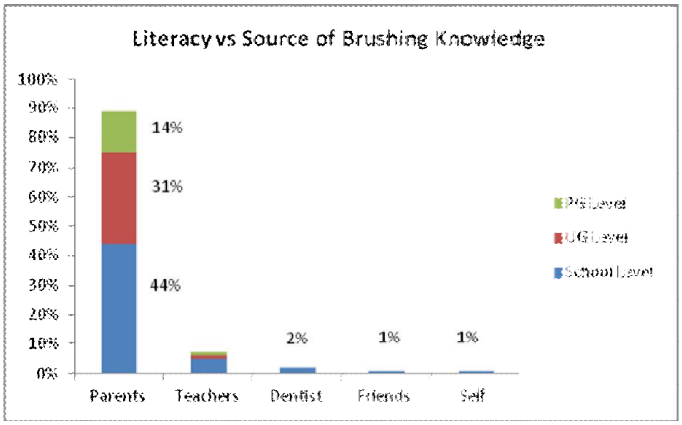
MATERIALS AND METHODS

The present study was carried out in 304 patients randomly selected from the out-patient department of the same dental

hospital. The patients who participated were from different age groups, socio economic status, educational backgrounds and locations. An informed verbal consent was obtained from the patients, to conduct the survey. The data collected was analyzed using Microsoft Excel (version 10) and tabulated along with explanatory visual charts with respect to the various parameters chosen.

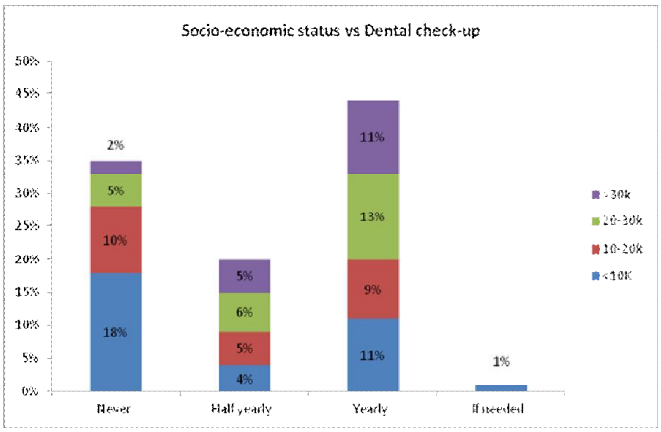
RESULTS

With regard to brushing knowledge, we observed almost 89% of the subjects had obtained their knowledge from their parents, while 7% got their knowledge from teachers, only 2% had been taught by dentists, and an insignificant percentage had learnt from friends or by self. Of the 89% who received their instruction from parents, 44% had had primary school education level, 31% under-graduate education and 14% post graduate education. Of the 7% who received their instruction from teachers, 4% were patients with primary education level, 2% were under-graduate level and 1% was post graduate level. Of the 2% who received their instruction from dentists, 0.8% were primary education level, 0.8% were patients with under-graduate education level and 0.4% where post graduate education level. 94% of the subjects acquired their brushing knowledge from single point sources, while 6% had multiple learning sources. Of this 6%, 10% were educated up to school level, 37% up to under graduate level and 53% had post graduate education (refer Graph 1).



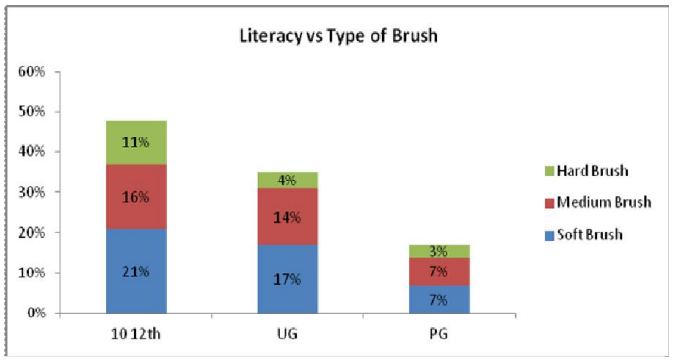
Graph 1.

On analyzing the brush change period it was noted 16% of the subjects changed their brush every month, while 40% changed it once every 3 months; 29% got a new brush every 6 months and 15% had no idea when they changed their brush. Of the 15% who were not aware of their brush changing period, 55% had a socio-economic status of <10k per month, 29%, 10-120k and 14% 20-30k and 2% were above >30k per month. Further examination of the data revealed the socio-economic status of the subjects under study. 92% of the people had a regular monthly income while 8% had no income. In the regular income group, 27% came under the <10k category, 28% came under the 10-20k category, 26% were in the 20-30k category and 19% fell in the >30k income slot. When the frequency of dental check up was compared to socio-economic status it was found that of the 35% who never visited a dentist, 18% were in the <10k category, 10% in the 10-20k category, 5% in the 20-30k category and 2% in the above 30k category. Among the 20% who visited a dentist once in six months, 4% were in the <10k category, 5% in the 10-20k category, 6% in the 20-30k category and 5% in the above 30k category. Of the 44% who visited the dentist yearly, 11% were in the <10k category, 9% in the 10-20k category, 13% in the 20-30k category and 11% in the above 30k category. A very insignificant percentage visited the dentist if needed (refer Graph 2).



Graph 2.

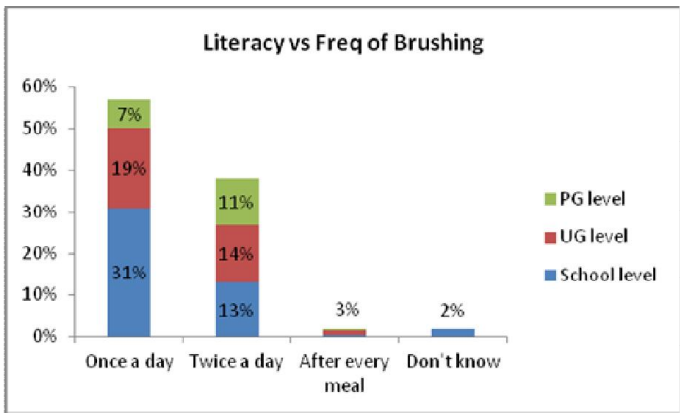
Of the total percentage of the subjects under study 96% was found to be literate and 4% were illiterate. Of the 96% literate, 46% were educated up to school level, 36% had under graduate education and 18% had post graduate education. It was observed 99% of the subjects used a conventional tooth brush and 2 persons used a traditional neem stick. Among patients with primary education, 21% used soft brush, 16% medium brush, 11% hard brush. Among 36 % under graduates, 17% used soft brush, 14% medium brush, 4% hard brush. Among 18 % post graduates, 7% used soft brush, 7% medium brush, 3% hard brush (refer Graph 3).



Graph 3.

Further study of the data showed a variation in the frequency of brushing among the study group. It was observed 57% brushed their teeth once a day, 38% twice a day, 3% after every meal and 2% had no knowledge of the frequency of brushing. Of the 57% who brushed once a day, 31% were educated up to primary school level, 19% had under graduate education and 7% had post graduate education. Of the 38% who brushed twice a day, 13% were educated up to primary school level, 14% had under graduate education and 11% had

post graduate education. Of the 3% of the patients who brushed after every meal, 0.6% were educated up to primary school level, 1.2% had under graduate education and 1.2% had post graduate education (refer Graph 4).



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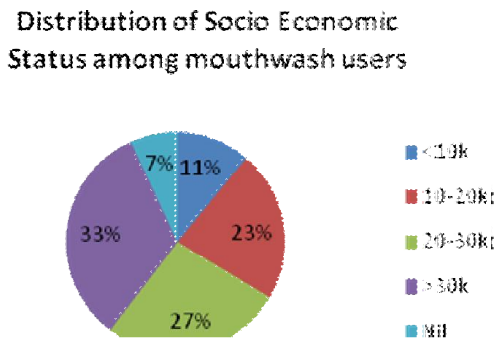
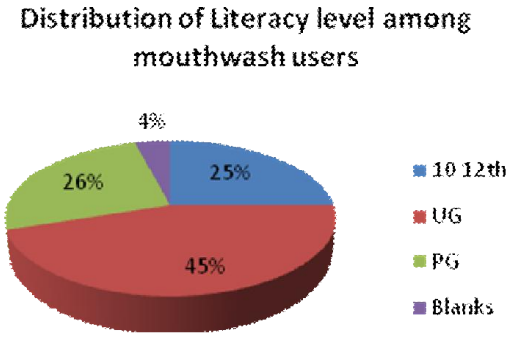
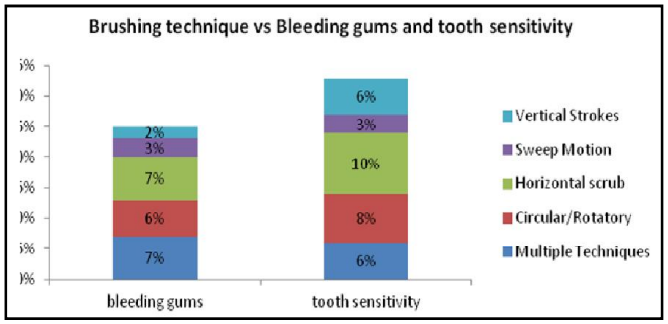


Graph 5a.



Graph 5b.

It was also noted that the duration of brushing varied from <30 seconds to more than 2 minutes. About 20% of the people brushed their teeth for less than 30 seconds, 53% brushed for 1-2 minutes and 27% more than two minutes. The use of mouthwash among the subjects was only 24%. Of this percentage only 33% fell in the above >30k economic status category. 27% were in 20-30k, 23% was under the 10-20k category and 11% in the <10k grouping (refer graph 5a). The literacy parameter was taken for analysis and the following emerged. 45% of those who used mouthwash were undergraduates, 26% post graduates and 25% primary education level (refer Graph 5b). Looking into the data further it was observed that 72% of the population adopted a single brushing technique and 28% followed multiple brushing techniques. In the 72% who used some specified single brushing technique, 26% used the circular method, 2% used the 45^0 angle, 40% horizontal, 11% sweep motion and 21% vertical. The prevalence of bleeding gums was found to be 25%. Comparing brushing techniques with the prevalence of bleeding gums, 7% followed multiple techniques, 6% followed circular motion, 7% followed horizontal strokes, 3% sweep motion and 2% brushed vertically (refer Graph 6). 33% of the people showed signs of sensitive teeth. A study of the correlation between tooth sensitivity and brushing technique adopted revealed 6% of sensitive teeth patients were found to have followed multiple techniques, horizontal scrub technique 10%, 8% followed circular or rotary motion, 6% vertical technique and only 3% followed sweep motion (refer Graph 6).



Graph 6.

DISCUSSION

One of the major public health problems causing significant social impact is disease of the oral cavity (The world oral health report 2003). Studies on oral health in rural areas show there is a lack of awareness in the general population cavity (Mittal *et al*., 2014) This study, done in a hospital setting, evaluated awareness of various brushing techniques across a cross section of a suburban South Indian population and its effects on oral health. There was a direct correlation between socio economic status and oral health care. Those from the lowest socioeconomic strata did not visit a dentist. A low average annual family income leads to lesser participation and engagement with oral health care. This correlates with earlier studies (Calvasina *et al*., 2016) (Graph 2). At the other end of the spectrum, those with higher per capital income reported a higher frequency of visits to a dentist and direct engagement with oral hygiene. With the use of brushing techniques, the majority of the study subjects (75%) used the single brushing technique utilizing the horizontal scrub method. (Graph 3) This group also reported a higher prevalence of bleeding gums and tooth sensitivity (Graph 6). Forceful tooth brushing, faulty and vigorous technique, use of a hard brush, dominant hand dexterity, abrasive dentifrices contribute to abrasion at the cervical areas resulting in tooth sensitivity and bleeding gums (Litonjua *et al*., 2005). Only three percent used the correct technique with proportionate good oral health with no bleeding gums or other markers of poor dental hygiene. Brushing frequency was also directly correlated with literacy rates. More than half of the subjects brushed only once a day. The frequency increased with increased literacy levels Graph 4).

Those who brushed more frequently had better oral health with less bleeding, plaque accumulation and calculus. These findings correlate with an earlier study by Blizniuk *et al*. (2015). When duration of brushing was analyzed, around half of the subjects showed a moderate brushing time of 1-2 minutes. Only 24% of the subjects used mouthwash regularly, being observed in the higher socio economic status subjects (Graph 5a). When the use of mouthwash was matched against literacy levels (Graph 5b), half were undergraduates, a quarter post graduates and primary education respectively. Higher education levels were associated with the use of regular mouth wash. This finding correlates with the study done by Mythry *et al*. (2015). The type of brush used varied according to the educational status of the subjects. Among who used hard brush, majority were educated up to primary school followed by under graduates and post graduates. This coincides with a study done by Prashanth *et al*. (2011). Almost half of the population used soft brushes, irrespective of their educational background. Results showed that the majority of subjects obtained their knowledge of brushing techniques form their parents, some from teachers and an insignificant percentage from dentists (refer graph 1). This shows dentists play a very peripheral role in imparting knowledge in oral hygiene and modern practices. Higher the parents' literacy level, greater was the knowledge of good brushing technique and consequently good oral health. On the contrary, parents with limited health literacy had poorer oral health and reported their children to have worse oral health related quality of life (Brega *et al*., 2016).

Conclusion

This study reveals the void in the level of awareness in basic oral hygiene and brushing techniques. Good brushing practices including flossing, are vital to maintain good oral health coupled with regular visits to the dentist (www.ADA.0rg/ public/topic/cleaning.asp). It also shows the need for dentists to play a more dominant role in educating the general public in the use of good brushes, safe brushing techniques, required frequency and optimum duration of brushing. There is direct relationship between educational qualification and oral hygiene conditions and also between socio – economic status and oral hygiene conditions. Co-operation from parents, educational institutions and government organizations can help bring about a sea change in the current trend and help towards improving literacy rates and socio-economic status, the major barriers to optimum oral health care.

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