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Effective Tooth Brushing Techniques Based on Periodontal Tissue Conditions : A Narrative Review

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A B S T R A C T

Introduction: Tooth brushing becomes ineffective if done with the wrong technique and not adapted to the condition of the periodontal tissue. Objective: To know the effective tooth brushing technique based on the condition of the periodontal tissue. Method: This literature study uses the Narrative Review method. References were collected, namely journals through the BMC Oral Health database, PubMed, and Google Scholar. Conclusion: The brushing methods that have been introduced have been shown to be effective in removing plaque, especially with the right technique. However, if the technique is wrong and not adapted to the condition of the periodontal tissue, it will have a negative impact because the dental plaque will not be completely cleaned.

INTRODUCTION

Tooth brushing is one of the preventive measures for dental and oral diseases by means of mechanical cleaning of dental plaque which is most often carried out, namely as a prevention of: dental hard tissue disease (dental caries), oral soft tissue disease (periodontal tissue) and bad breath (Halitosis). Tooth brushing requires good and correct technique and must be adapted to the condition of the oral tissues, especially the periodontal tissues.

Tooth brushing aims to remove plaque, so it must be done properly and correctly so that the action is effective, which is based on choosing the right type of toothbrush and brushing technique. Maximum action to remove bacterial plaque and food impaction can be done after eating. According to The American Dental Association (2009) brushing your teeth every day and regularly can remove plaque and prevent dental and oral diseases. This action will not have a detrimental effect on the oral cavity, but based on the reality, only a few people can remove plaque from their teeth. The act of brushing your teeth every day is very important to maximize sulcular cleaning as an act of controlling periodontal disease, besides that the use of fluoride toothpaste can also control dental caries. The Bass method, Stillman method, Charter method, Scrub method, Fones method and Roll method have been recommended for the last 20-30 years and are the best tooth brushing techniques based on the state of the periodontal tissue.

An effective brushing duration of about 30-45 seconds should be done per quadrant so brushing should not be done for less than 120 to 180 seconds (2-3 minutes). The recommended frequency of brushing teeth is twice a day, namely after breakfast and before going to bed and after eating to remove bacterial plaque and food impaction to the fullest. Based on international references, brushing teeth aims to: remove and prevent bacterial biofilm and prevent biofilm formation, remove impaction and food debris, remove stains on teeth, and massage gum tissue. Tooth brushing also requires special application to the teeth through a paste such as fluorine**.**

LITERATURE REVIEW

I. Tooth Brushing Technique

1. *Bass* Technique

The Bass technique is a tooth brushing technique that is often used by people who already have permanent teeth and is most commonly practiced by the public. This technique requires a soft brush with light pressure, short vibrations and light so that the bristles can enter the gingival sulcus. The Bass technique is highly recommended for preventing gingivitis, exposed enamel surfaces and roots. This technique can be used in patients with or without periodontal disease.

The method for using the Bass technique is: the brush head is parallel to the occlusal plane, with the brush head covering almost 3-4 teeth starting from the most distal teeth of the arch or per region of the arch, the soft bristles are directed to the gingival sulcus at an angle of 45 degrees to the axis tooth length, apply gentle vibration pressure in a back and forth direction. One arch region was brushed ten times.

The Bass technique can not only remove dental plaque at the gingival margin, but also subgingivally where the bristles enter the gingival sulcus. The advantage of this technique is that it is effective for removing plaque below the gingival margin, cervical region and gingival sulcus. And the drawback of this technique is that it causes injury to the gingival margin, takes a long time to brush teeth and causes gingival laceration.

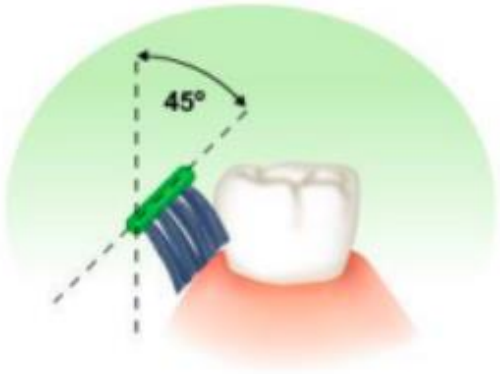

Figure.1 The Bass Method of Toothbrushing Techniques

2. Rolling Technique

The rolling technique is the most recommended technique, because it is simple and easy for children to do. In this method, a circular motion is instructed through the wrist holding the toothbrush. Sweep the surface of the teeth from top to bottom in a rolling motion of the wrist on the top teeth and bottom up on the bottom teeth. Insert a straight, tilted toothbrush on the inside of the front teeth, both on the upper and lower teeth, and sweep the brush from the inside out in a horizontal motion like back and forth, for the occlusal surfaces of the posterior teeth, both upper and lower. The rolling technique is known to be relatively easy to learn and effective for removing plaque even in proximal areas.

The advantage of this technique is that it can reduce plaque well and protect the gingiva properly so as to prevent gingival bleeding and can clean the labial, buccal, lingual and palatal surfaces, clean the gingival sulcus. The drawback of this technique is that it does not clean the gingival sulcus.

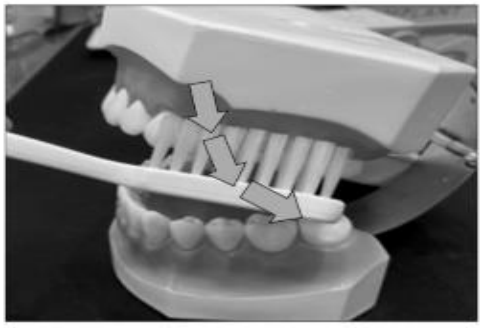

Figure.2 The Rolling Method of Brushing Techniques

3. Stillman technique

The Stillman technique can be used in cases of patients with widespread gingival inflammation. The purpose of this technique in gingival inflammation is to help stimulate the gingiva so that it can facilitate the gingival blood vessels.

How to brush your teeth using the Stillman technique, namely: the bristles are positioned at an angle of 45 degrees to the long axis of the teeth, and the bristles are partly placed on the gingiva and partly on the cervical part of the teeth. Movement in this technique is short back and forth with soft bristles and toothbrush 3 or 4 paths (per region) with light pressure. The effect of massage on the gingiva will be very good for increasing blood circulation in the inflamed gingival area. The movement of the Stillman technique can be modified by rolling after a zig-zag vibration of the gingiva.

Figure.3 The Stillman Method of Toothbrushing Technique

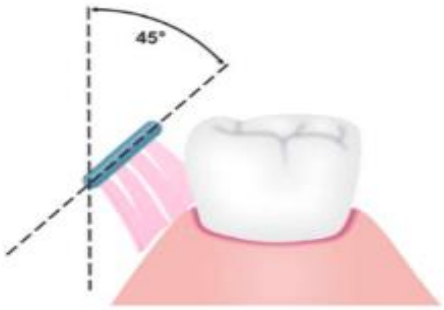

Figure.4 Placement of Brush Bristles Stillman's Method

4. Fones Technique

The fones technique is a tooth brushing method used for preschoolers. The toothbrush used is a small children's toothbrush with circular movements on the upper and lower jaw arches, while the movements in the posterior and occlusal areas are back and forth with gentle pressure. This technique is also used to train children's muscle development. The advantages of the phonetic technique are that it is easy to learn, takes a short time and is suitable for individuals with physical or emotional disabilities. The disadvantage of this technique is that it can cause trauma to the gingiva if excessive pressure is applied and insufficient cleaning of the interdental areas.

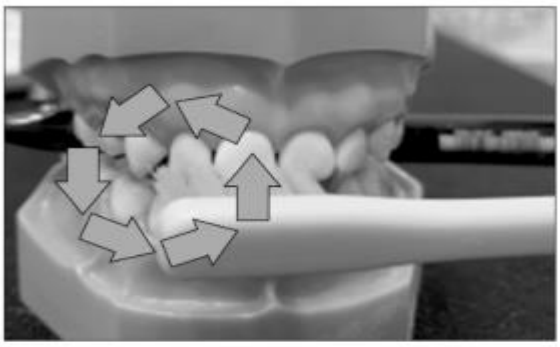

Figure.5 The Fones Method of Toothbrushing Techniques

5. Horizontal Technique

The horizontal technique is a popular tooth brushing technique. Movement in the technique is carried out on the tooth-surface scrub with horizontal movements back and forth. Tooth-surface scrubs can cause accumulation of micro-debris in the interdental area and cause cervical abrasion or hypersensitive dentin. The advantage of this technique is that it can brush freely, namely with horizontal movements, and can be combined with strong vertical and circular movements. Meanwhile, the drawbacks of this technique are that it is not effective for removing plaque, and can cause gingival abrasion and recession.

Figure .6 The Horizontal Method of Brushing Teeth Technique

6. Vertical Technique

The vertical technique is used on anterior tooth surfaces facing labially. The position of the toothbrush bristles is 90 degrees to the labial surface in occlusion. Vertical technique can also be done for the surface of the back teeth facing the buccal, the movement is the same but the jaw is open. This technique has the advantage of being effective in primary teeth. However, it has a disadvantage that the interdental area is not cleaned properly.

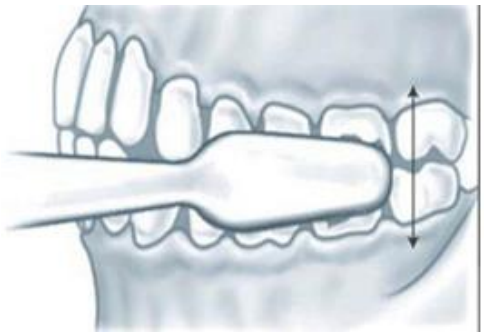

Figure.7 Vertical Method of Brushing Teeth Technique

7. Charter Techniques

The Charter technique is a technique for cleaning teeth in the interdental area. In this technique, the instruction is to insert the tip of the toothbrush in a direction perpendicular to the tooth axis (longitudinal) in the proximal area or 45 degrees from the gingiva to the axlusal direction of the tooth. Then, short vibrations are needed, namely back and forth focusing on the proximal area.

This technique is used in patients with cases of open interdental or interproximal spaces, orthodontic treatment, moderate gingival recession especially in the interdental area and post-periodontal surgery. The advantage of this technique is that it can remove plaque in patients with the above cases, and is highly recommended in post-periodontal surgery patients because it helps stimulate the marginal and interdental gingiva, and this tooth brushing technique is highly recommended in patients with orthodontic and prosthodontic treatment. The drawback of this technique is that it is not effective in cleaning dental plaque on the lingual and palatal sides.

Figure.8 The Charter Method of Toothbrushing Techniques

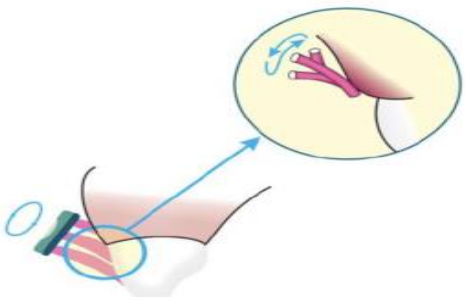

Figure.9 Placement of the Charter Method of Bristles

II. Appropriate Clinical Application of the Method for Each Patient

Tabel. 1 Teknik Menyikat Gigi yang Direkomendasikan Berdasarkan Usia dan Status Kesehatan Gigi dan Mulut

Patient state	Characteristic	Recommended method	Site	Device tooth-brush	Effect
General	No specific problems over age 7	Rolling Horizontal scrub Sweep in to out	Buccal/Lingual Occlusal Inn.Front.Teeth	Medium hardness	Plaq.Rem G. Massa Prev Calc
Preschool	Under age 6	Fones' (circular) Horizontal scrub	Lab/Buccal Occ/Lingual	Smal. size	Easy Habit Ch
Perio. Problem	Local.Gingivi Perio pocket	M. Bass	Gingival sulcus	2-lane brush	Sulcus cl. Ging.Ma.
Gingivitis	Wide gingivitis	M. Stillmans	Gingival	Soft bru	Ging. Ma
Hypersen.	Premolar. Can	Rolling	Cervical abrasi.	Soft des	Desensit.
Bridge wearer	Interdental Pontic bottom	M. Charters	Br.tip -45 dege. Bucc to Lingual	Zig-zag B. Super fl.	Prox. Cle Pontic. C
Fixed Orthodo. appliance	Bracket site Gingival site Proximal Lingual	Horiz.+Charters Bass Interd. Brush Rolling	Labial/Buccal Labial/Buccal Interdent.area Lingual	Concave head. Proxa B. Wat. Pik	Bracket cleaning Ging.ma. Prox. Cle
Implant. Denture wearer	Interdental Partial denture Full denture	Watanabe, T.Pik Modif. Rolling	Proximal Partial denture Full denture	2lane Br Part.Bru Full. Bru	Periimpl. Denture Cleaner

1. School-Age Child Dental Patient

In school-age children who still have mixed teeth, and do not have specific abnormalities in the oral cavity, for example the use of orthodontic devices. The technique that suits the state of the mouth is by using the Rolling method (Table.1).

2. Preschool Age Child

In preschool-aged children, the appropriate tooth brushing technique is using the Fones method, which in the future the child will switch to the Rolling method. (Table.1).

3. Gingivitis Patients

In patients with gingivitis, the recommended technique is the Bass method because this method removes plaque up to the gingival sulcus as well as massages the gingiva, thus facilitating gingival blood circulation. (Table.1).

4. Patients with extensive cases of gingivitis accompanied by periodontitis.

In patients with this case, it is recommended to modify the Stillman method with the charter method and then add the Rolling Technique (Table 2.1).

5. Bridge Users

In patients who use fixed denture bridges, the recommended brushing technique for these patients is using the Charters method. In this technique, tooth brushing is carried out in the inter-proximal area and at the base of the pontic area, with short back and forth movements by inserting the tip of the bristle into the proximal or lower pontic area and placing the toothbrush head backwards 45 degrees from the long axis of the tooth (Table.1).

6. Patients with Fixed Orthodontic treatment

In patients with this case, the recommended method is to use the horizontal technique. Tooth brushing was performed on the labial surfaces to clean the upper and lower brackets, and then briefly vibrated in the upper, lower and subgingival sulcus from 1 tooth to the other. The next step is to use the rolling technique on the lingual surface and back and forth movements on the occlusal surface.

III. The Effectiveness of Toothbrushing as an Oral Hygiene Measure

Tooth brushing can control plaque and debris in individuals so it is very effective in preventing dental and oral diseases, such as caries, calculus, gingivitis and others. In a study by Salzer et al (2020) brushing your teeth can reduce dental plaque by around 36% -65%. Periodontal tissue health can be done by carefully and thoroughly cleaning supragingival bacterial plaque through brushing every 24-48 hours so that it is enough to prevent gingivitis.

Periodontal disease is caused by subgingival bacteria originating from supragingival dental plaque. In the next process, plaque accumulation for approximately 72 hours will cause gingival inflammation. This requires regular dental plaque removal by using fluoride-containing toothpaste so as to prevent dental hard tissue disease, namely dental caries.

IV. Side Effects of Brushing Teeth

The application of a good and correct method of brushing teeth can be proven to be able to clean dental plaque and it will be even better if the method is adapted to the condition of the periodontal tissue. Based on international research that has been done, one of the effects of brushing teeth also has an impact on the health of periodontal tissues such as gingival recession, tooth abrasion, deposit transfer, and poor oral hygiene.

Gingival recession as a negative side effect of tooth brushing is frequently reported. This can happen because the frequency of tooth brushing, the horizontal brushing method every day, the hardness of the bristles, the duration of brushing, and the frequency of changing toothbrushes which affect the quality of the bristles.

Brushing teeth that are too strong and the quality of the bristles are hard is one of the causes of abrasive teeth and the mucosa exposed to the hard bristles can cause injury or trauma to soft tissues.

METHODOLOGY

The method used in this literature study is Narrative Review. References were collected, namely journals through the BMC Oral Health database, PubMed, and Google Scholar between 2011-2023. The selected journal is adjusted to the title, keywords, abstract and contents of the journal.

DISCUSSION

Gingivitis is a disease caused by uncontrolled accumulation of dental plaque. If gingivitis is not managed properly, it will develop into acute periodontitis to chronic periodontitis. There are many references that recommend plaque control as a preventive measure for periodontal disease. Scaling treatment, toothbrush selection, use of proper tooth brushing technique and mechanical interdental cleaning can control plaque well. Gingivitis and periodontitis can be prevented by plaque control. Tooth brushing is the primary method of maintaining daily oral hygiene. The ideal brushing method is one that removes dental plaque without causing damage to the teeth, gingiva or other tissues.

Many methods of brushing teeth have been described as efficient and effective in removing plaque. These methods can be categorized mainly according to the pattern of motion when brushing your teeth. Tooth brushing technique is the activity of removing soft dirt deposits on the surface of the teeth and gums, brushing teeth is a preventive health effort aimed at maintaining healthy teeth and oral cavity. Several tooth brushing methods that have been introduced are horizontal, vertical, roll, vibratory, fone's or circular methods, including the combination method. Patients with periodontal disease are most often advised to use a sulcular brushing technique using vibrational motions to increase access to the gingival margin area. It is important for patients to understand that removing plaque biofilm at the dento-gingival junction is necessary to prevent caries as well as periodontal disease. The most frequently recommended method is the Bass technique because it emphasizes the placement of the feathers in this most important area. Placement of bristle in gingival sulcus and alignment of bristle tip with gingival margin to reach supragingival plaque biofilm and access some subgingival biofilm.

According to research conducted by Rizkika et.al in 2019, it showed that the horizontal method of brushing teeth caused Class IV Miller gingival recession in as many as 56% of 43 people compared to the vertical brushing technique. The cause is intense pressure when brushing teeth continuously so that it can cause injury to soft tissue and cause gingival recession. Another factor that causes gingival recession is improper tooth brushing patterns, including frequency of brushing teeth, method of brushing teeth, hardness of bristles, duration of brushing teeth, and frequency of changing toothbrushes. Based on research by Houwink et al (2020) errors in tooth brushing techniques that are often found in the community, namely: brushing pressure that is too strong, aggressive movements when brushing teeth, brushing teeth for too long, frequency of brushing teeth too often, toothbrush bristles toothpaste, and abrasive toothpaste, will cause wear and tear on the tooth enamel, dentin, and result in the exposure

of the root surface of the tooth. Mistakes in brushing teeth can result in cases of gingival recession.

In a study written by Ausenda et al (2019) regarding the effect of the Bass technique to reduce inflammation in the gingiva, namely using research subjects aged 18 years, having at least 20 teeth, 20% Bleeding on Probing (BoP) in the cervical area and gingival depth at the time of probing 1 -3mm. The study consisted of one initial examination and two follow-up meetings. All subjects were instructed to brush their teeth twice a day for 2 minutes using the Bass technique and the non Bass technique. At the initial examination the total plaque score of the subjects using the Bass technique was 83% and the plaque score of the subjects not using the Bass technique was 87.5%. While the BoP score for subjects using bass techniques was 26.8% and 28.1% for non-bass subjects. Then after 12 weeks of being examined again, subjects using the Bass technique had a plaque score of 27.2% and a BoP of 11.6%. While subjects who did not use the Bass technique had a plaque score of 39.2% and a BoP score of 43.8%. The conclusion of this study is that the Bass technique is more effective in reducing plaque and BoP compared to subjects who brush their teeth without using the Bass technique.

Research conducted by Khanjani (2021) in which researchers evaluated three different tooth brushing techniques in preventing periodontal disease in patients with fixed orthodontic treatment. The subjects of this study used 57 patients who underwent fixed orthodontic treatment, had mild gingivitis, had at least 20 teeth, and were 12 ≤ years old. Patients were randomized into three groups (Horizontal, modified Stillman, and modified Bass) randomly. Patients were instructed to brush their teeth three times a day and use dental floss once a day. Gingival index and plaque were recorded at baseline, after 2 weeks and after 3 months. The gingival index and plaque index decreased significantly when using the 3 tooth brushing methods. However, age and gender did not have a statistically significant relationship with the periodontal parameters recorded in the three subject groups.

According to research conducted by Hapsari et al (2020) concerning the effectiveness of plaque cleaning and gingival repair between the modified circular tooth brushing technique and the natural tooth brushing technique in children aged 10-12 years. The number of samples is 62 children in each group. All participants in the control group followed the tooth brushing protocol using natural methods or not using tooth brushing techniques. In this study, most of the participants (79%) in the intervention group could systematically perform the modified circular method with the correct position and movement when brushing their teeth. In that study a greater reduction in plaque was found in each sextant of the intervention group, indicating that this new method may be suitable for most sextants. At the beginning of the intervention, the results obtained were that there was no difference in the conditions of plaque and gingivitis, but the effectiveness of the modified circular method in removing dental plaque and reducing gingival inflammation was significantly shown within one month compared to the natural method. This study also showed a decrease in gingival inflammation of almost 43% in the intervention group

compared to the control group which only experienced a decrease in gingival inflammation of 1.5%. This study revealed that the practice of natural tooth brushing in children aged 10-12 years is not recommended because this method is not effective in removing dental plaque or reducing gingivitis. Most children forget to brush their lingual areas and leave plaque uncovered, which increases the risk of developing dental caries and gingivitis.

Other research related to tooth brushing technique is research conducted by Janakiram et al (2020) which examines comparisons between tooth brushing techniques, bass, phones, and horizontal modification methods. The subjects in this study were young adults aged 18-30 years from dental schools in India. The inclusion criteria of this study were patients with mild to moderate gingivitis who had at least 20 natural teeth without a history of periodontal therapy or antibiotic treatment before 6 months from the start of the study. A total of 120 participants were enrolled for the study, two participants did not complete their follow-up visit (after 28 days). However, these participants were included in the analysis and missing values were accounted for using the Last Observation Continued (LOCF) method. The average age of the study subjects was 22 years and women comprised 66.6% of the study sample. At the initial visit, the mean plaque scores measured were 0.74 ± 0.39, 0.77 ± 0.34 and 0.98 ± 0.36 for the Modified Bass, Fones and Horizontal techniques, respectively. After 24 hours without oral hygiene activity the plaque scores increased to 1.04 ± 0.30, 1.11 ± 0.32 and 1.21 ± 0.40. After 1 week after the intervention, the mean plaque scores decreased to 0.78 ± 0.36 and 1.03 ± 0.43. After 28 days of using the intervention the plaque scores increased to 1.13 ± 0.44, 1.14 ± 0.40 and 1.08 ± 0.34.

In the research conducted by Tukey (2019) it was shown that during the initial visit, when the brushing technique was modified Bass was compared to the Fones and Horizontal methods. The Horizontal brushing technique showed statistically significant results (0.009) and when the Fones brushing technique was compared to the modified Bass and Horizontal brushing it can be seen that the Horizontal brushing technique showed statistically significant results (0.03) in reducing the amount of plaque. After 24 hours and 28 days without oral hygiene activity there was no significant difference between tooth brushing techniques. During 1 week using the intervention, when the Bass modification technique was compared to Fones and Horizontal, the Horizontal method showed statistical significance (0.01) in reducing the amount of plaque. Research conducted by Bonferroni (2021) explains that in the modified Bass brushing technique, there is a significant difference after 24 hours without using oral hygiene measures (<0.01) and after 28 days (<0.01) when compared to the initial visit. After 24 hours without oral hygiene activity there was a significant difference observed after 1 week (<0.01) and after 1 week using the intervention (tooth brushing technique) there was a significant difference after 28 days (<0.01). In the Fones tooth brushing technique at the first visit compared to visits after 24 hours, after 1 week and after 28 days there were significant differences at all visits, namely after 24 hours (<0.01), after 1 week (<0.01) and 28 days (0.001) using the intervention. In the horizontal brushing technique, there was a significant difference at the baseline visit compared to after 24 hours (<0.01). There was also

a significant difference after 24 hours without oral hygiene measures when compared to after 1 week (0.002).

CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS

Periodontal disease is a pathological condition that affects the supporting tissues of the teeth and is chronic in nature so that complaints or symptoms that arise are only realized by the patient when the condition is advanced. Periodontal disease can be prevented by plaque control. Self-cleaning of plaque by brushing your teeth. Tooth brushing is one of the recommended modern oral hygiene measures adopted as the primary oral hygiene ingredient. It is considered as the main mechanical device for removing large amounts of plaque to prevent oral diseases, while maintaining dental aesthetics and preventing Halitosis.

Many methods of brushing teeth have been described as efficient and effective in removing plaque. These techniques can be categorized mainly according to the pattern of motion when brushing your teeth. Several tooth brushing methods that have been introduced are the Horizontal, Rolling, Fone's, Stillman, Charter, and Vertical methods. Brushing your teeth with the right technique is no doubt proven to be effective in removing plaque. However, when using the wrong technique, the effects will be bad, such as gingival recession, tooth abrasion, deposit transfer, and poor oral hygiene.

2. RECOMMENDATIONS

Based on the above conclusions, this literature study is highly recommended to:

a. Dentistry Practitioners (Dentists and Dental Nurses)

Through this literature study, dentistry practitioners can provide directions to patients regarding appropriate ways to brush their teeth based on the condition of the periodontal tissue so that they can effectively remove dental plaque which can cause caries and periodontal disease.

b. Public

Through this literature study, the public can find out that there are tooth brushing techniques that can be adapted to the conditions of the periodontal tissue so that they can be used as guidelines in preventing caries and periodontal disease due to the accumulation of plaque.

ADVANCED RESEARCH

This literature study needs further research using experimental research types with analytical methods so that this research can prove the effectiveness of tooth brushing techniques based on the condition of the periodontal tissue with more real and accountable results.

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REFERENCES

Ausenda F, Jeong N, Arsenault P, Gyurko R, Finkelman M, Dragan IF, Levi Jr PA. The effect of the bass intrasulcular toothbrushing technique on the reduction of gingival inflammation: a randomized clinical trial. Journal of Evidence Based Dental Practice.2019;19(2):106-14.

Bok HJ, Lee CH. Proper Tooth Brushing Technique According to Patient's Age and Oral Status. Int J Clin Prev Dent. 2020;16(4):149-153.

Citradi JL, Hatta I, Azizah A. The Effectiveness of the Roll Tooth-Brushing Technique Toward Gingival Health Status of Totally Blind People. Dentino: Jurnal Kedokteran Gigi. 2022;7(1):1-5.

Digel I, Kern I, Geenen EM, Akimbekov N. Dental Plaque Removal by Ultrasonic Toothbrushes. Dent J. 2020;8(28):1-13.

Emini, Erwin, Tari SJ. Metode Menyikat Gigi dan Resesi Gingiva Pada Kelompok Ibu Posyandu Garuda Bekasi Utara. Media Kesehatan Gigi. 2021; 2(20): 7-12.

GemmaWheeler.UltrasonicBrush: https://www.electricteeth.com/uk/sonic-vs-ultrasonic-electric-toothbrush-comparison-info graphic/

Hapsari I, Hunsrisakhun J. Comparison of Modified Circular and Natural Toothbrushing Methods in Effectiveness of Dental Plaque Removal and Gingival Improvement. Journal of International Oral Health. 2020;12(1):20-26.

Iba B, Adamu V. E. Tooth brushing: An effective oral hygiene measure. Orapuh Journal. 2021;2(2):1-7.

Janakiram C, Varghese N, Venkitachalam R, Joseph J, Vineetha K. Comparison of modified Bass, Fones and normal tooth brushing technique for the efficacy of plaque control in young adults-A randomized clinical trial. Journal of clinical and experimental dentistry. 2020;12(2):e123.

Khanjani N, Fakhabi SFM, Nikkhah M, Maleki A, Maleki D. Effective Tooth Brushing Technique to Manage Periodontal Diseases in Orthodontic Patients: A Double-Blind Randomized Controlled Trial. Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2021;10(4):12-16.

Mandal A, Singh DK, Siddiqui H, Das D, Dey AK. New Dimensions in Mechanical Plaque Control: An Overview. Indian Journal of Dental Sciences. 2018;9(2):133-139.

Marya CM. A textbook of public health dentistry. JP Medical Ltd; 2011;278-285.Minnuthfatin SA, Setyawardhana RHD, Kurniawan FKD. Perbandingan Efektivitas

Newman dan Carranza. Clinical Periodontology 13th ed. Philadelphia:Elsevier. 2019: 89-92.

Nocini R, Lippi G, Mattiuzzi C. Periodontal disease: the portrait of an epidemic. Journal of Public Health and Emergency. 2020;4(10):1-6.

Penggunaan Sikat Gigi Konvensional dan Sikat Gigi Elektrik Terhadap Penurunan Indeks Plak. Dentin. 2022;6(2).

Rajwani AR, Hawes SND, To A, Quaranta A, Rincon Aguilar JC. Effectiveness of Manual Toothbrushing Techniques on Plaque and Gingivitis: A Systematic Review. Oral Health& Preventive Dentistry. 2020 Oct 2;18(1):843-854.

Rizkika L, Mintjelungan CN, Zuliari K, Khoman J. Hubungan Teknik Menyikat Gigi dengan Keparahan Resesi Gingiva pada Masyarakat Pesisir Pantai di Kawasan MegamasnKota Manado. e-GiGi. 2019;7(2).

Sälzer S, Graetz C, Dörfer CE, Slot DE, Van der Weijden FA. Contemporary practices for mechanical oral hygiene to prevent periodontal disease. Periodontology 2000.2020;84(1):35-44.

Singh G, Mehta DS, Chopra S, Khatri M. Comparison of sonic and ionic toothbrush in reduction in plaque and gingivitis. Journal of Indian Society of Periodontology. 2011;15(3):210-214.

SpotlightOralCare.Sonictoothbrush:https://eu.spotlightoralcare.com/products/spotlight-sonic-brush

Suhasini J, Valiathan M. Brushing Techniques. European Journal of Molecular& Clinical Medicine. 2020;7(2):6601-6611.

Wadswothfamily.HNWadswoth. https://www.wadsworthfamily.net/2022/02/20/h-n-wadsworth-and-the-toothbrush/ [Diakses 31 Maret 2023]