Prevalence of different types of bleaching techniques used for management of discolored tooth/teeth.

Anubhav Das, Vigneshwar T*

Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, Tamil Nadu, India

Abstract

Aim: To see prevalence of different types of bleaching techniques used for management of discolored tooth/teeth.

Methods: A total of 68 patients who underwent bleaching from October 2020 to March 2021 have been included in this study. Data was collected from dental college patient management software, it was tabulated in excel and then imported to SPSS software for statistical analysis and chi-square test was done to check for statistical significance.

Results: It was seen that there was no significant difference between the age and the type of bleaching technique used, between gender and type of bleaching technique used.

Conclusion: Within the limitations of the study we can conclude that there is statistical association between types of bleaching technique used, reason for doing bleaching and age, gender of patients.

Keywords: Vital-bleaching, Non-vital bleaching, Innovative technique, Discolouration, Fluorosis.

Introduction

Tooth discoloration is highly aesthetically non appealing and the dentists and the patients expend considerable amounts of time and money in attempts to improve the appearance of discolored teeth. The different methods to manage discolored teeth range from: Surface stain removal; Bleaching or tooth whitening techniques; Operative techniques which can camouflage the underlying tooth discoloration, such as composite or ceramic veneers and crowns. There are different types of bleaching techniques and have attracted much interest from the aesthetic dentists, as they are noninvasive and relatively simple to carry out. Conventional bleaching systems are based primarily on hydrogen peroxide or one of its precursors, notably carbamide peroxide, and these are often used in combination with an activating agent such as heat or light. There are two types of bleaching techniques - Bleaching techniques where bleaching agents are applied externally to the teeth surface (vital bleaching), or inside the teeth within the pulp chamber (non-vital bleaching) [1,2].

Both these bleaching techniques aim to bleach the chromogens within the dentin, thereby bringing about a change in overall colour of the tooth. A variety of case reports and clinical studies have shown that night guard vital bleaching technique, where 10% carbamide peroxide gel is applied to the tooth surface in a bleaching tray at night through a a 10% carbamide peroxide gel used in a bleaching tray at night, produces predictable results [1,3–10], same as hydrogen peroxide strips [11]. Another study which showed effective results from 'power bleaching technique' which used 35% hydrogen peroxide [1,12]. The exact mechanism which involves the bleaching is not fully understood but is hypothesized to involve the influx of oxygenating molecules via enamel micro pores along a diffusion gradient followed by direct access to dentin. These break down the double bonds in between the pigment molecules thereby making it smaller in size which diffuses outside the tooth or to those that absorb less light and hence appear lighter. Hydrogen peroxide forms a weak bond with urea to produce carbamide peroxide which is easily dissociated in the presence of water to release free radicals that penetrate through the enamel and into the dentin to produce the bleaching effect. The breakdown of hydrogen peroxide into free radicals that penetrate through the tooth surface occurs either by photo dissociation, anionic dissociation or a combination of the both [1].

Our team has extensive knowledge and research experience that has translate into high quality publications [13-32]. In this present retrospective study we checked for the prevalence of different types of bleaching techniques used for the management of discoloured tooth/teeth.

Materials and Method

Study design

A retrospective study.

Study setting

Case records of patients in a private dental institution in Chennai.

***Correspondence to:** Vigneshwar T, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences (SIMATS),Chennai, Tamil Nadu, India, E-mail: vigneshwart.sdc@saveetha.com

***Received:** 15-Apr-2022, Manuscript No. AACDOH-22-60875; **Editor assigned:** 18-Apr-2022, PreQC No. AACDOH-22-60875 (PQ); **Reviewed:** 02-May-2022, QC No. AACDOH-22-60875; **Revised:** 05-May-2022, Manuscript No. AACDOH-22-60875 (R); **Published:** 12-May-2022, DOI:10.35841/aacdoh- 6.3.113*

***Citation:** Das A, Vigneshwar T. Prevalence of different types of bleaching techniques used for management of discolored tooth/teeth. J Clin Dentistry Oral Health. 2022;6(3):113*

Inclusion and exclusion criteria

All the patients who underwent bleaching for their tooth/teeth discolouration from March, 2020 to March, 2021 were included in this study. Patients with incompletely filled case sheets and who were not willing for bleaching for their discoloured tooth/teeth were excluded from analysis.

Ethical approval

The approval for this study was given by the ethical board of Saveetha Institute of Medical and Technical Sciences

Statistical analysis

Saveetha dental college and hospital manages its patients' data using the dental information archival system (DIAS). Data was extracted, and treatments were categorized for each patient based on the type of bleaching technique used and entered into an excel sheet; and data was randomly checked at regular intervals for accuracy to verify veracity and avoid errors.Data was analyzed using SPSS V28 (IBM, IL, CH) and the type of bleaching technique used. The level of statistical significance was set at 0.005%.

Results and Discussion

This retrospective study was designed in order to check for the prevalence of different types of bleaching techniques used for management of discoloured tooth/teeth. In our study, we found that there was no statistical association between type of bleaching technique used, reason for doing bleaching and age, gender of the patients. The results of this study indicated that all bleaching techniques were unique for each case and there is no significant statistical association between age and gender. Similar findings reported by other studies [33]. A similar result was observed when analyzing both data sets for participants older than 40 years of age [34]. It has been reported that every one-year increase in the participant's age reduced the degree of whitening by 7% [35]. Younger individuals have less chromatic teeth and the majority of stains are extrinsic in nature which can be easily oxidized by bleaching agents. The older age group who received home bleaching did not maintain a lighter tooth colour (**Figures 1-4**).

Conclusion

Within the limitations of this study, we can conclude that there is no significant statistical association between type of bleaching technique, reason for doing bleaching and age, gender of the patients.

Conflict of Interest

None to declare.

Acknowledgement

I would like to show our gratitude to the Director of Academics, DR. Deepak Nallasamy Veeraiyan, Saveetha Institute of Medical and Technical Sciences, for sharing his

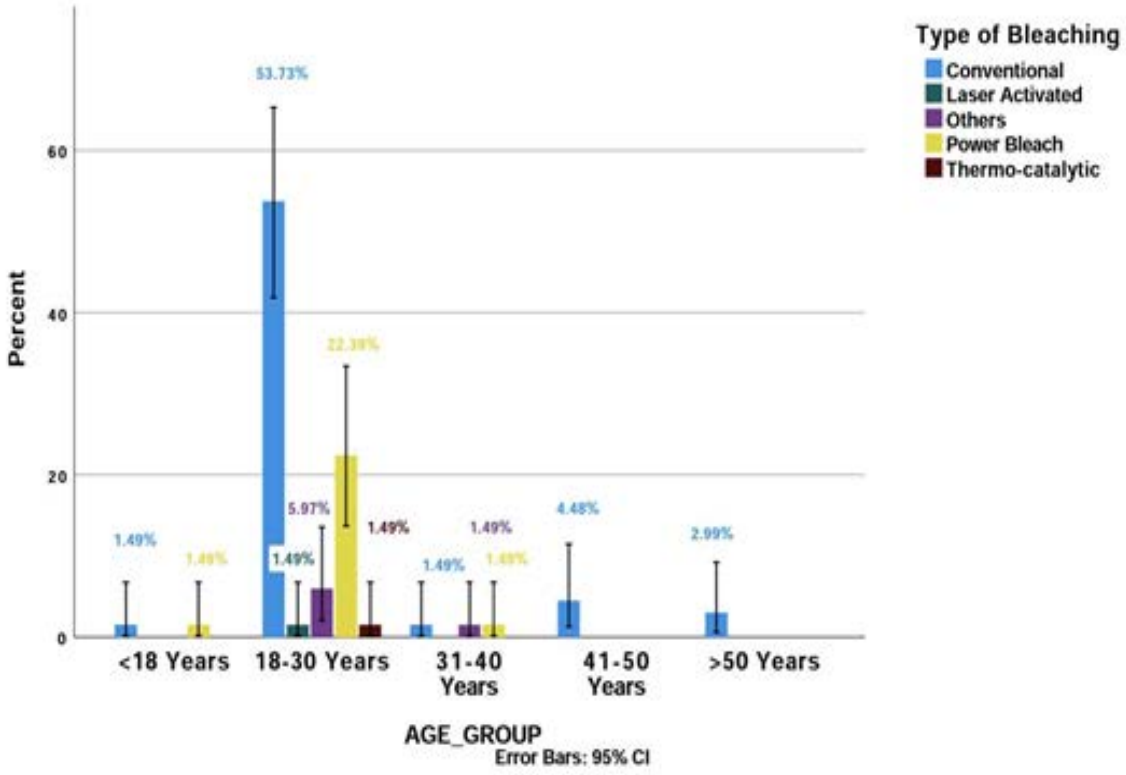

Figure 1. *Bar graph showing association between different types of bleaching techniques done among various age groups. X-axis represents the different age groups and Y-axis represents the type of bleaching technique used, where blue denotes conventional, green denotes laser activated, purple denotes power bleach and brown denotes thermo-catalytic type of bleaching. There was no statistical association between age and type of bleaching used (p=0.654).*

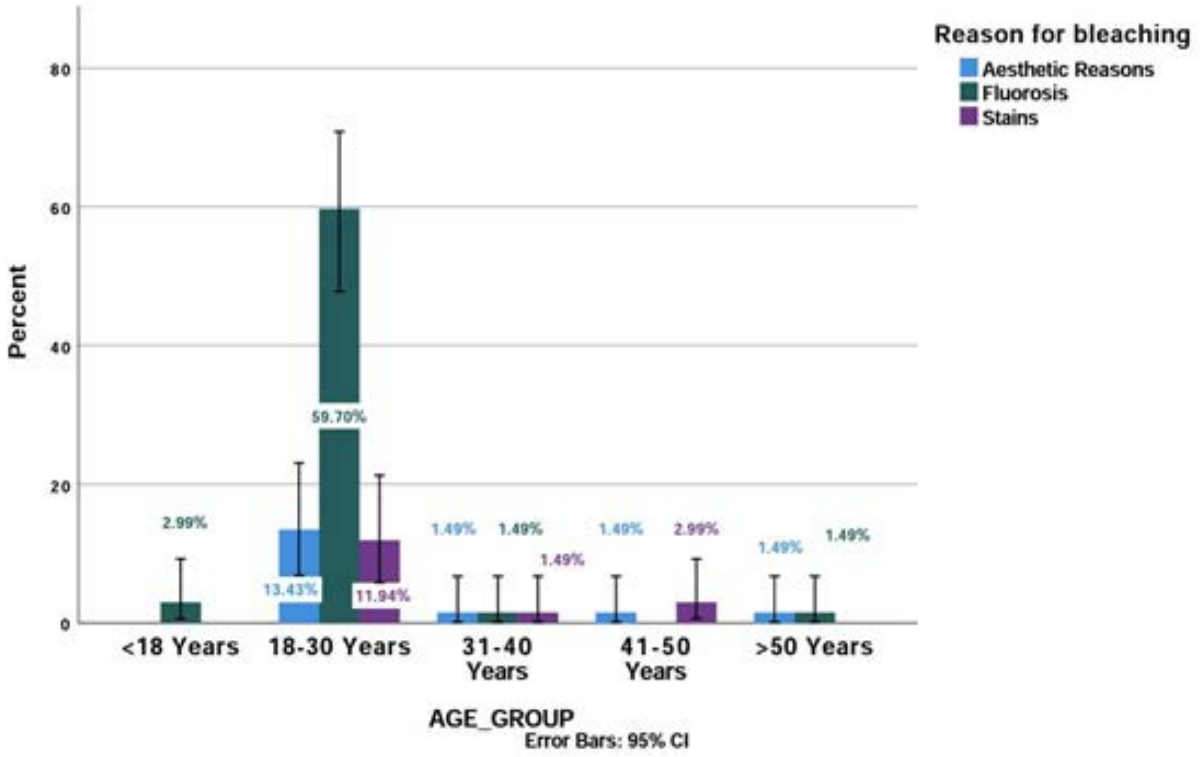

Figure 2. *Bar graph showing association between reasons for bleaching done among various age groups. X-axis represents the different age groups and Y-axis represents the reasons for bleaching , where blue denotes for aesthetic reasons, green denotes fluorosis and purple denotes stains.There was no statistical association between age and reason for doing bleaching (p=0.277).*

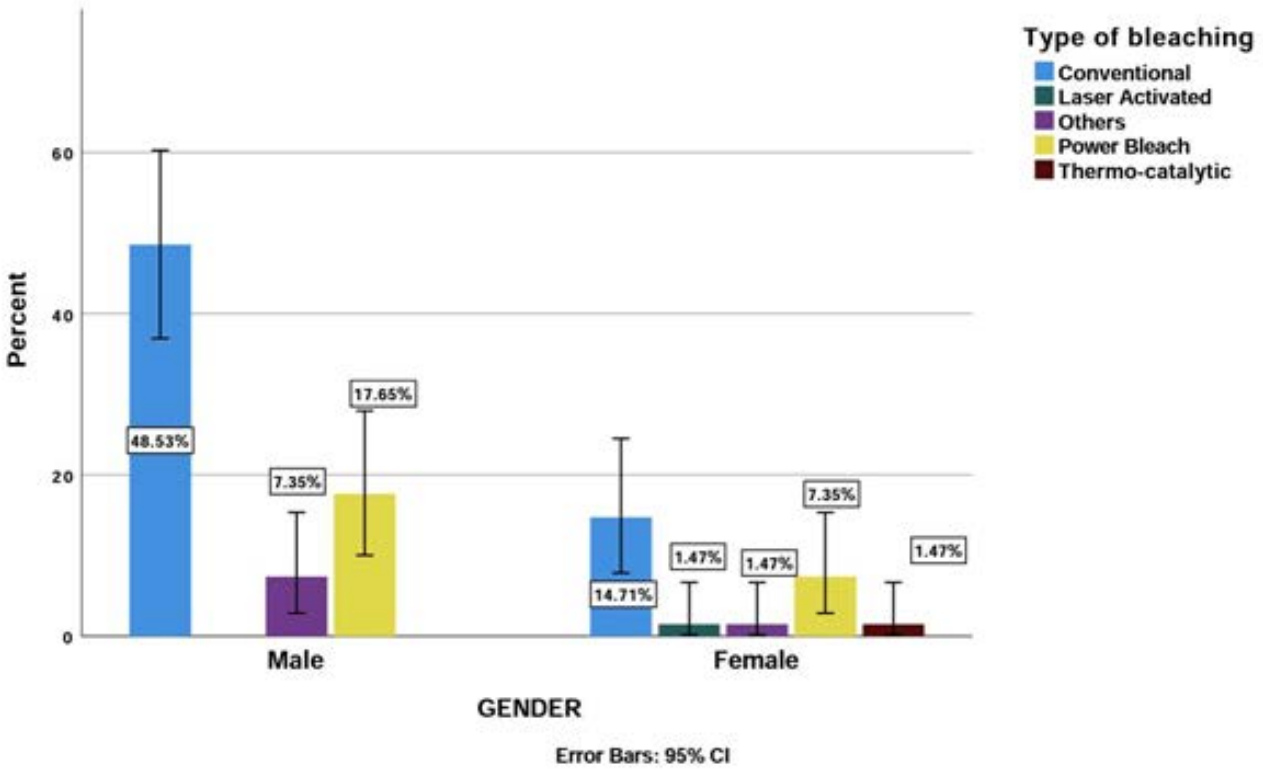

Figure 3. *Bar graph showing association between different types of bleaching techniques done among gender. X-axis represents gender and Y-axis represents the type of bleaching technique used, where blue denotes conventional, green denotes laser activated, purple denotes power bleach and brown denotes thermo-catalytic type of bleaching.There was no statistical association between gender and type of bleaching used (p=0.188).*

Citation: *Das A, Vigneshwar T. Prevalence of different types of bleaching techniques used for management of discolored tooth/teeth. J Clin Dentistry Oral Health. 2022;6(3):113*

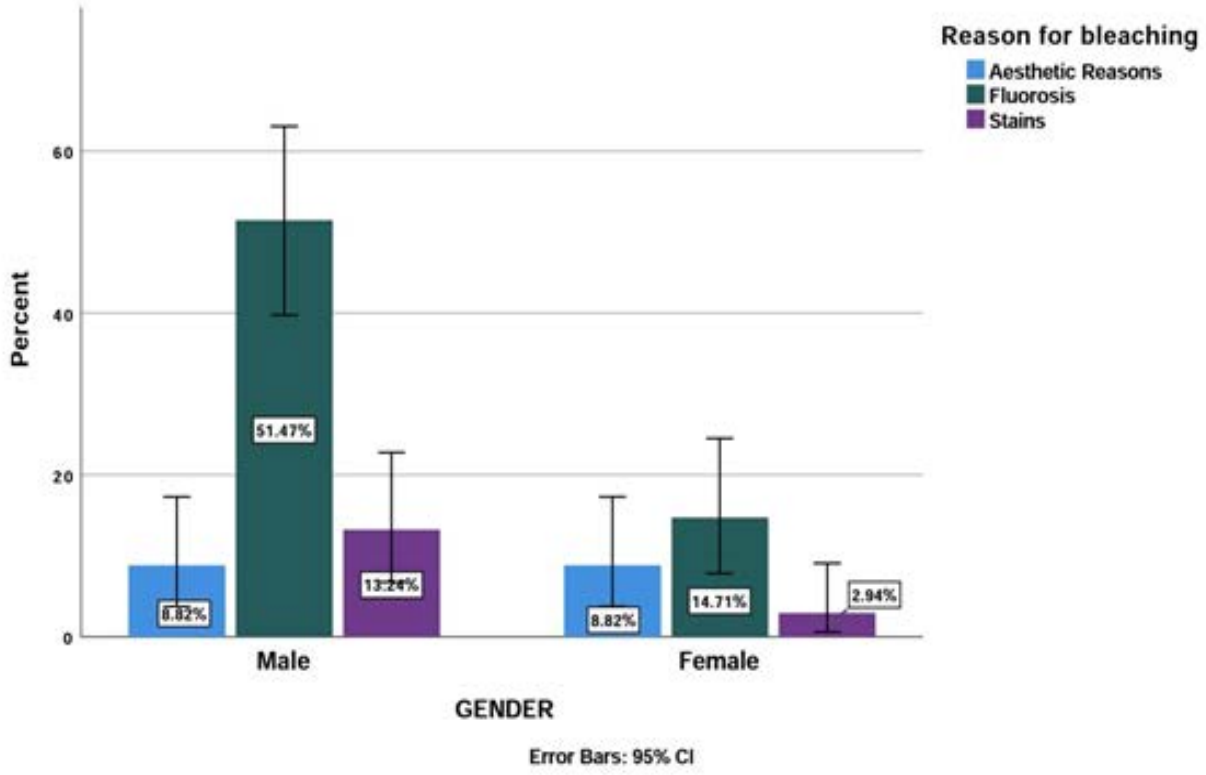

Figure 4. *Bar graph showing association between reasons for bleaching done among gender. X-axis represents the gender and Y-axis represents the reasons for bleaching , where blue denotes for aesthetic reasons, green denotes fluorosis and purple denotes stains.There was no statistical association between gender and reason for doing bleaching (p=0.121).*

pearls of wisdom with us during the course of this research, and we thank the reviewers for their so-called insights. We are also immensely grateful to the Department of Conservative Dentistry and Endodontics, Saveetha Dental College for their comments on an earlier version of the manuscript, although any errors are our own and should not tarnish the reputations of these esteemed persons.

Source of Funding

The present study was supported by the following agencies:

Saveetha Dental College

Saveetha Institute of Medical and Technical Science

Sarkav Healthcare services

References

1. Greenwall L. Bleaching techniques in restorative dentistry: An illustrated guide. CRC Press. 2001.
2. Friedman S. Internal bleaching: long-term outcomes and complications. J Am Dent Assoc. 1997; 128:51S–55S.
3. Nightguard vital bleaching. Dental Abs. 2013;150–1.
4. Kowitz GM, Nathoo SA, Rustogi KN, et al. Clinical comparison of Colgate Platinum Tooth-whitening System and Rembrandt Gel Plus. Compend Suppl. 1994;646–51.
5. Howard WR. Patient-applied tooth whiteners. J Am Dent Assoc. 1992;123:57–60.
6. Matis BA, Cochran MA, Eckert G, et al. The efficacy and safety of a 10% carbamide peroxide bleaching gel. Quintessence Int. 1998;29:555–63.
7. Reinhardt JW, Eivins SE, Swift EJ Jr, et al. A clinical study of nightguard vital bleaching. Quintessence Int. 1993;24:379–84.
8. Papathanasiou A, Bardwell D, Kugel G. A clinical study evaluating a new chairside and take-home whitening system. Compend Contin Educ Dent. 2001;22:289–94.
9. Onwudiwe UV, Umesi DC, Orenuga OO, et al. Clinical evaluation of 16% and 35% carbamide peroxide as in-office vital tooth whitening agents. Nig Q J Hosp Med. 2013;23:80–4.
10. Mccaslin AJ, Haywood Vanb, Potter BJ, et al. Assessing Dentin Color Changes From Nightguard Vital Bleaching. J Am Dental Ass. 1999;1485–90.
11. Gerlach RW, Zhou X. Vital bleaching with whitening strips: summary of clinical research on effectiveness and tolerability. J Contemp Dent Pract. 2001;2:1–16.
12. Sulieman MAM. The Development and Evaluation of a Method In-vitro to Study the Effectiveness and Safety of Tooth Bleaching. 2005.
13. Muthukrishnan L. Imminent antimicrobial bioink deploying cellulose, alginate, EPS and synthetic polymers for 3D bioprinting of tissue constructs. Carbo Poly. 2021;260:117774.

14. PradeepKumar AR, Shemesh H, Nivedhitha MS, et al. Diagnosis of vertical root fractures by cone-beam computed tomography in root-filled teeth with confirmation by direct visualization: a systematic review and meta-analysis. J Endo. 2021;47(8):1198-214.

15. Chakraborty T, Jamal RF, Battineni G, et al. A review of prolonged post-COVID-19 symptoms and their implications on dental management. Int J Environ Res Public Health. 2021;18(10):5131.

16. Muthukrishnan L. Nanotechnology for cleaner leather production: A review. Environ Chem Lett. 2021;19(3):2527-49.

17. Teja KV, Ramesh S. Is a filled lateral canal–A sign of superiority? J Dent Sci. 2020;15(4):562.

18. Narendran K, MS N, Sarvanan A. Synthesis, Characterization, Free Radical Scavenging and Cytotoxic Activities of Phenylvilangin, a Substituted Dimer of Embelin. Ind J Pharmac Sci. 2020;82(5):909-12.

19. Reddy P, Krithikadatta J, Srinivasan V, et al. Dental caries profile and associated risk factors among adolescent school children in an urban South-Indian city. Oral Health Prev Dent. 2020;18(1):379-86.

20. Sawant K, Pawar AM, Banga KS, et al. Dentinal Microcracks after Root Canal Instrumentation Using Instruments Manufactured with Different NiTi Alloys and the SAF System: A Systematic Review. App Sci. 2021;11(11):4984.

21. Bhavikatti SK, Karobari MI, Zainuddin SL, et al. Investigating the Antioxidant and Cytocompatibility of Mimusops elengi Linn Extract over Human Gingival Fibroblast Cells. Int J Enviro Res Public Hea. 2021;18(13):7162.

22. Karobari MI, Basheer SN, Sayed FR, et al. An In Vitro Stereomicroscopic Evaluation of Bioactivity between Neo MTA Plus, Pro Root MTA, BIODENTINE & Glass Ionomer Cement Using Dye Penetration Method. Mat. 2021;14(12):3159.

23. Rohit Singh T, Ezhilarasan D. Ethanolic extract of Lagerstroemia Speciosa (L.) Pers., induces apoptosis and cell cycle arrest in HepG2 cells. Nutr Cancer. 2020;72(1):146-56.

24. Ezhilarasan D. MicroRNA interplay between hepatic stellate cell quiescence and activation. Euro J Pharmacol. 2020;885:173507.

25. Romera A, Peredpaya S, Shparyk Y, et al. Bevacizumab biosimilar BEVZ92 versus reference bevacizumab in combination with FOLFOX or FOLFIRI as first-line treatment for metastatic colorectal cancer: a multicentre, open-label, randomised controlled trial. Lancet Gastroenterol Hepatol. 2018;3(12):845-55.

26. Raj R K. β-Sitosterol-assisted silver nanoparticles activates Nrf2 and triggers mitochondrial apoptosis via oxidative stress in human hepatocellular cancer cell line. J Biomed Mat Res Part A. 2020;108(9):1899-908.

27. Vijayashree Priyadharsini J. In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens. J Periodontol. 2019;90(12):1441-8.

28. Priyadharsini JV, Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen A. baumannii and related species. Archiv Oral Biol. 2018;94:93-8.

29. Uma Maheswari TN, Nivedhitha MS, Ramani P. Expression profile of salivary micro RNA-21 and 31 in oral potentially malignant disorders. Braz Oral Res. 2020;34.

30. Gudipaneni RK, Alam MK, Patil SR, et al. Measurement of the maximum occlusal bite force and its relation to the caries spectrum of first permanent molars in early permanent dentition. J Clini Pediatr Dent. 2020;44(6):423-8.

31. Chaturvedula BB, Muthukrishnan A, Bhuvaraghan A, et al. Dens invaginatus: a review and orthodontic implications. Br Dent J. 2021;230(6):345-50.

32. Kanniah P, Radhamani J, Chelliah P, et al. Green synthesis of multifaceted silver nanoparticles using the flower extract of Aerva lanata and evaluation of its biological and environmental applications. Chem Select. 2020;5(7):2322-31.

33. Sulieman M, Macdonald E, Rees JS, et al. Tooth bleaching by different concentrations of carbamide peroxide and hydrogen peroxide whitening strips: an in vitro study. J Esth Restor Dent. 2006;18(2):93-100.

34. Bernardon JK, Sartori N, Ballarin A, et al. Clinical performance of vital bleaching techniques. Oper Dent. 2010;35:3–10.

35. Rezende M, Loguercio AD, Kossatz S, et al. Predictive factors on the efficacy and risk/intensity of tooth sensitivity of dental bleaching: A multi regression and logistic analysis. J Dent. 2016;45:1–6.

Citation: *Das A, Vigneshwar T. Prevalence of different types of bleaching techniques used for management of discolored tooth/teeth. J Clin Dentistry Oral Health. 2022;6(3):113*