



Original article

IMPACT OF BAKING SODA ON TEETH WHITENING AMONG TOBACCO USERS - AN INTERVENTIONAL STUDY

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Abstract

Background: A more stylish and wonderful grin has been a typical longing for a great many people looking for dental treatment. Tooth tint is considered as a fundamental factor in the dental charisma, especially in the front upper dentition. Tooth staining might be brought about by inherent or outward stain or a blend of tooth. Baking soda is the successful and simple strategy to improve brightening of teeth. As a decisive assurance of the nurse, it is one of responsibility to dealing with the patient's consideration to survey the oral mucosa and settle on resulting techniques for oral cleanliness and improving teeth brightening.

Methods and methodology: The present study aims to assess the effectiveness of baking soda on whitening of teeth among tobacco users. A quantitative quasi-experimental research design was conducted among 60 tobacco users. Purposive sampling technique was used to select samples. Semi-structured interview was used to collect demographic data and teeth whitening was assessed using Modified Lobene Stain Index. The tobacco users in experimental group were given baking soda to brush the teeth two

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minutes per day. After one week, the tooth was re-assessed.

Results: The study results show significant improvement in the teeth whitening among experimental group than control group after the intervention at the level of $p < 0.001$.

Conclusion: This reveals that baking soda is highly significant in the experimental group because it improves teeth whitening of the tobacco users. This indicates that baking soda is the effective and easy method to improve teeth whitening.

Key words: Tobacco users; Whitening of teeth; Oral health; Baking soda

INTRODUCTION

A smile has an incredible effect in the excellence conscious society, and when it is reduced by any dental infection, it frequently brings about loss of confidence and harm to physical and psychological well-being.¹ A more stylish and wonderful grin has been a typical longing for a great many people looking for dental treatment. Tooth tint is considered as a fundamental factor in the dental charisma, especially in the front upper dentition.² Staining of the teeth might be come about because of extrinsic or intrinsic stains. Natural stains are created by endogenous stains are produced by endogenous chromo gens inside the finish and dentition, whereas outward stains are brought about by the authoritative of exogenous chromo gens to polish the surface. A few techniques have been proposed to eliminate staining including miniature scraped area including large scale scraped spot and blanching. Recently the attractiveness of brightening specialists that can be utilized by individuals to help teeth has been expanded. These items might be very helpful in subjects experiencing extraneous stains, for example, tobacco clients and smokers.³ Tooth brightening or tooth is the way towards helping the shade of human teeth. Brightening is regularly attractive when teeth become yellowed after some time for the quantity of reason and can be accomplished by changing the characteristic or outward shade of the chromo gens inside or on the teeth is named as fading. Baking soda is the dynamic fixing most usually utilized in brightening teeth items and conveyed as either hydrogen peroxide.⁴

Consumers crave for sound looking teeth has driven to extension and publicity of dentifrices clearly defined to help brighten teeth predominantly by the evacuation and counteraction of outward tooth stain.⁵ While the fundamental stain expulsion fixing in this strategy is the rough extra evacuation and avoidance viability, including wellsprings of baking soda to give blanching movement and phosphate aggravates that are thought to de-ingest stain compounds.⁶

Tooth tint, particularly for teeth in the maxillary foremost region, typically viewed as one of key segments in the impression of dental feel and individual allure. The mission for more white teeth is certifiably not another style. Tooth staining was perceived in the writing as a dental issue over 150 years prior, and the utilization of numerous techniques and answer for eliminate tooth stains can be followed back over a century. Shoppers have been progressively inspired by tooth brightening. The proceeded with request by the general population thusly has advance advances in tooth brightening innovation, prompting assortment of tooth dyeing gels and strips as well as chemical agents.⁷

Baking soda is produced from soda ash otherwise called sodium bicarbonate. It is one among cleaning expert since it is a mild alkali and can make soil and oil break down effectively in water for powerful evacuation. The most effortless technique to help brighten your teeth with preparing baking soda is essentially to blend about a tablespoon of heating soft drink with about a tablespoon of water in a little. You will make thick paste that you can apply to your teeth with your fingers or a delicate seethed toothbrush. For a best outcomes brush for around two minutes by rotator movements and check to cover all around your mouth, by hitting every tooth. Try not to scour excessively hard or utilize a lot of power. Following two minutes, let out the heating pop and flush your mouth completely with water or mouth wash. Flush your toothbrush too. Baking soda will for the most part should be utilized accurately to secure the teeth lacquer. The Baking soda ought to preferably not be utilized every now and again since it tends to be harmed the lacquer as the after effect of incessant use. It ought to commonly just be utilized once every day and for two minutes at a time.⁸

In modern era esthetics has played an imperative role in contemporary civilization. Through social and news sources more noteworthy mindfulness has been spread on the ideal magnificence of guys and female the same, along these lines making an awareness of defect among the world.¹⁰ Priyadarsini.A & Sugantha has assessed the effectiveness of crushed bay leaves in removing dental plaque among tobacco chewers. This is also an alternative intervention to remove the dental stain. The samples were advised to brush twice a day using the crushed bay leaves powder for one week. After one week, the plaque score was re-assessed.¹¹

As a nurse it's our responsibility is to managing the patient's care to assess the oral mucosa and decide on subsequent methods of oral hygiene. And there is no much studies done on the 'Baking soda' on whitening of teeth and the society is not aware of the teeth whitening. So, the researcher felt the need that to contribute newer practices in tobacco users and to improve their teeth color. This study has aimed to find out the effectiveness of baking soda on whitening of teeth among tobacco users.

The purpose of the study [1] to assess the teeth whitening of tobacco users in experimental and control group, [2] to assess the effectiveness of baking soda on whitening of teeth among tobacco users in experimental and control group and [3] to associate the effectiveness of baking soda on whitening of teeth with the demographic variables among tobacco users in experimental group.

METHODS AND MATERIALS:

A quantitative approach with quasi experimental research design was used to conduct the study in Chennai. 60 samples were selected by using Purposive sampling technique. The criteria for sample selection the tobacco users above 19-70 years, the clients who are all having the yellowish teeth. The exclusion criteria for the samples are tobacco users with no dental cavities and gum diseases, or mouth cancer patients, tobacco users who are all allergic to baking soda. The data collection period was done with prior permission from the village head of and ethical clearance was obtained from the institution (SIMATS). The purpose of the study was explained to the samples and written informed consent was obtained from them.

The demographic data were collected using a semi structured interview questionnaire, and the teeth whitening was assessed using Modified Lobene Stain Index. The teeth color was assessed before using the baking soda among both the control and experimental group. Then tobacco users in experimental group

were given baking soda to brush for two minutes per day. After one week, the teeth whitening was re-assessed among both experimental and control group.

The data were analyzed using descriptive and inferential statistics. The sample characteristics were described using frequency, percentage, mean and standard deviation (descriptive statistics). Paired t test and unpaired t test is used to assess the effectiveness of baking soda among tobacco users in experimental and control group (inferential statistics). Chi square was used to associate the post-test level of teeth whitening with the selected demographic variables (inferential statistics).

RESULTS AND DISCUSSION:

Section A: Sample characteristics

Among 60 samples, 30 samples belong to experimental group, where most of the tobacco users in the experimental group belong to 10(33.3%) were aged between 31 – 50 years, 25(83.3%) were male, 17(56.7%) were Hindus, 11(36.7%) had no formal education, 13 (43.3%) were coolie, all 30(100%) were residing in urban area, 14(46.7%) were using smokeless tobacco and 20(66.7%) were using tobacco for above 5 years.

Section B: Level of teeth whitening among tobacco users in experimental group

The teeth whitening in the experimental group, most of the tobacco users, 13(43.33%) had light stain, 9(30%) had moderate stain and 8(26.67%) had heavy stain among tobacco users whereas in the post test 14(46.67%) had light stain, 12(40%) had no stain and 4(13.33%) had moderate stain. (Table 1). In experimental group-stained area is assessed in that 16(53.33%) had stain upto 1/3 area affected, 8(26.67%) had stain between 1/3 and 2/3 area affected, 5(16.67%) had stain more than 2/3 area affected and only 1(3.33%) had no stain area among tobacco users whereas in the post test 13(43.33%) had stain upto 1/3 area affected, 12(40%) had no stain area and 5(16.67) had stain between 1/3 and 2/3 area affected. (Table 2). The teeth whitening in control group during pre test, 13(43.33%) had light stain, 9(30%) had moderate stain, 7(23.33%) had heavy stain and only 1(3.33%) had no stain among tobacco users whereas in the post test 15(50%) had light stain, 6(20%) had moderate stain, 5(16.67%) had heavy stain and 4(13.33%) had no stain (table 1). In control group-stained area assessed, 12(40%) had stain upto 1/3 area affected, 9(30%) had stain between 1/3 and 2/3 area affected, 7(23.33%) had stain more than 2/3 area affected and only 2(6.67%) had no stain area among tobacco users whereas in the post test 14(46.67%) had stain upto 1/3 area affected, 7(23.33%) had stain between 1/3 and 2/3 area and more than 2/3 area affected and 2(6.67%) had no stain area. (table2)

The present study finding is supported by Soeteman, G. D., Valkenburg, C., Van der Weijden, G. A., Van Loveren, C., Bakker, E., & Slot, D. E. conducted a study on whitening dentifrice and tooth surface discoloration. The result is an effect according to the original lobene stain index; this result is in favor to the whitening dentifrice, for the modified lobene stain index was -0.41(95%: -0.71; -0.10) for over all stain intensity was 0.35 (95%; -0.71;0.10) in nearly all dentifrice that are formulating for tooth whitening were shown have an effect in reducing discoloration.¹² Another investigation which supported the current investigation is Soparkar, P., & Newman, M. B. who conducted a study to assess the effects of a Baking

Soda Gum on extrinsic dental stain: results of a longitudinal 4-week assessment. After 4 weeks, the reduction in measurable extrinsic stain in the baking soda gum group was statistically significant ($P = .0044$) relative to baseline. The magnitude of the unadjusted longitudinal reduction in extrinsic stain in the baking soda gum group was 29.7% at 4 weeks.¹³

The present study depicts that the pretest mean score of stain intensity was 1.83 with standard deviation 0.83 and the post test mean score of stain intensity was 0.73 with standard deviation 0.69. The calculated paired 't' test value of $t = 9.104$ was found to be statistically highly significant at $p < 0.001$ level. This clearly infers that there was significant improvement was observed in the post test level of stain intensity among tobacco users in the experimental group which clearly indicates that baking soda was found to be effective in reducing the stain intensity among tobacco users. The present study depicts that the pretest mean score of stain area was 1.56 with standard deviation 0.81 and the post test mean score of stain area was 0.83 with standard deviation 0.69. The calculated paired 't' test value of $t = 4.853$ was found to be statistically highly significant at $p < 0.001$ level. This clearly infers that there was significant improvement was observed in the post test level of stain area among tobacco users in the experimental group which clearly indicates that baking soda was found to be effective in reducing area affected by stain among tobacco users. (Table 3). From the results it is proven that the pretest mean score of stain intensity was 1.40 with standard deviation 0.93 and the post test mean score of stain intensity was 1.30 with standard deviation 0.98. The calculated paired 't' test value of $t = 1.795$ was not found to be statistically highly significant. This clearly infers that there was no significant improvement was observed in the post test level of stain intensity among tobacco users in the control group. (Table 4 and table 5)

Another study was conducted a study on effectiveness of a new dentifrices with baking soda and peroxide in removing stain and whitening teeth. One hundred and fortysix qualifying subjects were randomly assigned. The whitening dentifrices group had statistically significant ($p < 0.0001$) mean shade score reductions of 1.82 and 2.57 from baseline to weeks 4 and 6. For tooth stain the MLSI total mean scores for the whitening dentifrices group showed ($p < 0.0001$) decreases from baseline of 1.42 (41.6%) and 2.11 (61.6%) score.¹⁴

The present study also shows that the demographic variable duration of tobacco usage had shown statistically significant association with post test level of stain intensity among tobacco users at $p < 0.05$ level and the other demographic variables had not shown statistically significant association with post test level of stain intensity among tobacco users in the experimental group.

Table 1: Frequency and percentage distribution of pretest and post test level of stain intensity among tobacco users in the experimental and control group. n = 60(30+30)

| Group | Stain Intensity | No Stain | | Light Stain | | Moderate Stain | | Heavy Stain | |
|--------------------|-----------------|----------|-------|-------------|-------|----------------|-------|-------------|-------|
| | | No. | % | No. | % | No. | % | No. | % |
| Experimental Group | Pretest | 0 | 0 | 13 | 43.33 | 9 | 30.0 | 8 | 26.67 |
| | Post Test | 12 | 40.0 | 14 | 46.67 | 4 | 13.33 | 0 | 0 |
| Control Group | Pretest | 1 | 3.33 | 13 | 43.33 | 9 | 30.0 | 7 | 23.33 |
| | Post Test | 4 | 13.33 | 15 | 50.0 | 6 | 20.0 | 5 | 16.67 |

Table 2: Frequency and percentage distribution of pretest and post test level of stain area among tobacco users in the experimental and control group n =60 (30+30)

| Group | Stain Area | No Stain | | Stain upto 1/3 area affected | | Stain between 1/3 and 2/3 Area affected | | Stain >2/3 Area affected | |
|--------------------|------------|----------|------|------------------------------|-------|---|-------|--------------------------|-------|
| | | No. | % | No. | % | No. | % | No. | % |
| Experimental Group | Pretest | 1 | 3.33 | 16 | 53.33 | 8 | 26.67 | 5 | 16.67 |
| | Post Test | 12 | 40.0 | 13 | 43.33 | 5 | 16.67 | 0 | 0 |
| Control Group | Pretest | 2 | 6.67 | 12 | 40.0 | 9 | 30.0 | 7 | 23.33 |
| | Post Test | 2 | 6.67 | 14 | 46.67 | 7 | 23.33 | 7 | 23.33 |

Table 3: Effectiveness of baking soda on whitening of teeth (stain intensity) & stain area among tobacco users in the experimental group. (n = 30)

| Stain Intensity | Mean | S D | Paired 't' test Value |
|-----------------|------|------|--|
| Pretest | 1.83 | 0.83 | t = 9.104 p = 0.0001 S*** |
| Post Test | 0.73 | 0.69 | |
| Stain Area | Mean | S D | Paired 't' test Value |
| Pretest | 1.56 | 0.81 | t = 4.853 p = 0.0001 S*** |
| Post Test | 0.83 | 0.69 | |

***p<0.001, S – Significant

Table 4: Comparison of pretest and post test level of stain intensity among tobacco users in the control group. (n = 30)

| Stain Intensity | Mean | S D | Paired 't' test Value |
|-----------------|------|------|------------------------------|
| Pretest | 1.40 | 0.93 | t = 1.795 p = 0.083 NS |
| Post Test | 1.30 | 0.98 | |

N.S – Not Significant

Table 5: Comparison of pretest and post test level of stain area among tobacco users in the control group.

n = 30

| Stain Area | Mean | S D | Paired 't' test Value |
|------------|------|------|------------------------------|
| Pretest | 1.70 | 0.91 | t = 1.439 p = 0.161 NS |
| Post Test | 1.63 | 0.92 | |

N.S – Not Significant

CONCLUSION:

Baking soda is the effective and easy method to improve whitening of teeth. From the result of the study, it was concluded that baking soda helps to improve whitening of teeth among tobacco users. Baking soda also helps in face and body scrub and soften skin and helps to relieves skin itching from insect bites and pain from sunburn.

SOURCE OF FUNDING:

Nil

CONFLICTS OF INTEREST:

The authors declare no conflicts of interest.

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