Original Research Article

A survey among Palestinian dentists regarding preferences over vital and non-vital teeth bleaching: a cross-sectional study

Rabi TH

Dr Tarek H Rabi
BDS, MSc.
Lecturer
Al Quds University Palestine
tarekrabi@gmail.com

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Correspondence to:
Dr Tarek H Rabi
tarekrabi@gmail.com

ABSTRACT

Background: *With bleaching treatments becoming very popular, assessment was conducted among Palestinian dentists to check their preferences.*

Objective: *To evaluate the preferences of general dentists regarding vital and non-vital tooth bleaching therapies and to investigate whether the time of clinical practice influences these options.*

Material & methods*: A cross-sectional study was conducted among 200 Palestinian dentists. Options regarding bleaching therapies including the first choice of material, technique and clinical practice for vital and non-vital tooth bleaching therapies were included in the 20 item questionnaire. Data were submitted to descriptive analysis and the associations were evaluated using chi-square test (p<0.05)*

Results: *The response rate was 56.7%. In-office therapy (50.9%) was the preferred treatment of choice for the dentists, followed by a combination of in-office and at-home therapies (29.8%); At home therapies were the least preferred (19.3%). Hydrogen peroxide more than 22% was the preferred treatment of choice for vital bleaching therapy (57.9%), whereas the combination of sodium perborate with water or hydrogen peroxide (46.5%) was the preferred treatment of choice for non-vital bleaching. There was a significant association between the time since graduation and the preference for in-office bleaching (P=0.01) and no significant association between the time since graduation and the material used.*

Conclusion: *In-office bleaching was preferred over at-home therapies; HP >22% and sodium perborate with water or HP were chosen as first treatment options to manage discolored vital and non-vital teeth, respectively. The time in clinical practice had an effect only on the choice of vital bleaching technique.*

Keywords*: tooth bleaching, vital bleaching, non-vital bleaching, hydrogen peroxide, sodium perborate*

Introduction

The cosmetic dentistry has taken giant leaps in the recent decades, with great advancements in the field and increased demand for an alluring and captivating smile. [1] Bleaching has been the in-demand treatment of choice for the same. In-office bleaching of teeth has been in use for approximately 125 years, with little change in science or technique since that time. When at-home bleaching using carbamide peroxide was introduced in 1989, it appeared that the in-office approach would quickly become obsolete. However, there has been a recent resurgence in the in-office bleaching, primarily due to aggressive marketing of various advanced light sources such as lasers and plasma arc lights, coupled with claims of reducing bleaching time, even to a single office visit. [2]

Bleaching techniques commonly involve at-home, in-office, and over-the-counter modalities. At-home techniques involve dentist-supervised tray delivered gel

prescribed over a period of time. In-office techniques involve professionally delivered treatment methods containing higher concentrations of the chemicals involved, usually hydrogen peroxide. The techniques are considered to be faster and more reliable as it is professionally delivered. These can be accentuated with the help of light activation devices. An array of studies has evaluated the efficacy of both in-office and at home bleaching techniques. [3-6] The attitude of dentists towards their preferences for choosing a specific treatment modality has been studied among dentists, [7] as well as among dental students. [8] However, the attitude of dentists towards their preferences for bleaching modalities in Palestine has not been studied. Hence, the aim of this study is to evaluate the preferences of general dentists regarding vital and non-vital tooth bleaching therapies and to investigate whether the time of clinical practice influences these options.

Material & methods

The study was conducted with a cross-sectional design among Palestinian dentists to evaluate their preference regarding vital and non-vital treatment options. 200 dentists registered with the Palestinian dental association were requested to participate using an online survey. The survey was approved by the Palestinian Dental Association ethics committee. A self-administered questionnaire consisting of a 6-point survey instrument was devised for the same. The survey instrument was devised with the help of a similar study conducted. [7] The information was collected regarding sociodemographic variables (age and sex), and time since graduation. The survey instrument also included 4 closed questions. The first and second questions referred to vital tooth bleaching: 1)" What is your favorite protocol to bleach vital teeth?", with three possible answers: a) at home; b) in-office; c) both, and 2)" What is your first choice to bleach discolored vital teeth?", with the following possible answers: a) 10% hydrogen peroxide (HP); b) 15 to 22% HP; c) 22% HP; d) 15-22% Carbamide Peroxide(CP) or e) >22% CP. The third question referred to non-vital tooth bleaching: "What is your first choice to bleach discolored non-vital teeth?" with the possible answers: a) > 22% CP; b) 15 to 22% HP; c) high concentration (>22%) HP; d) sodium perborate (SP) + water/or HP. The fourth question was related to their belief about the effect of light on bleaching and was answered as either yes or no. They were also asked whether they had the light bleaching unit in the dental office. Data were submitted to descriptive analysis and the associations were evaluated using chi-square test ($p<0.05$)

Results

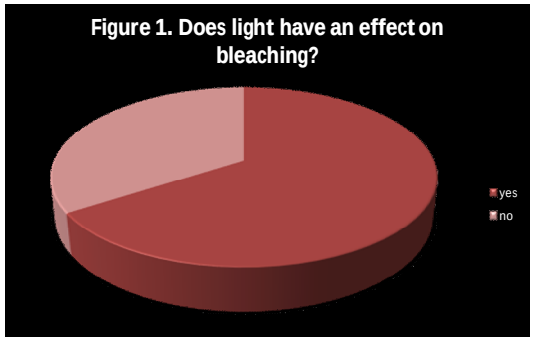
Out of the 200 dentists who were asked to participate in the study, 114 dentists responded with a response rate of 56.7%. The descriptive analysis has been illustrated in table 1. The study sample consisted of 58% males and 42% females. Considering, time since graduation, 36.8% of the study sample had less than 5 years since graduation, 31.6% had 6-10 years time since graduation, and 31.6% had more than 10 years since graduation. In-office therapy (50.9%) was the preferred treatment of

choice for the dentists, followed by a combination of in-office and at-home therapies (29.8%); At home therapies were the least preferred (19.3%).

Table 1. Descriptive analyzes of the studied variables among dentists (n=114). Palestine, 2015.

Variables	N=114	%
Gender		
Male	66	58%
Female	48	42%
Time since graduation (years)		
Less than 5 years	42	36.8%
6-10 years	36	31.6%
More than 10 years	36	31.6%
Type of bleaching (vital)		
In-office	58	50.9%
At home	22	19.3%
Both	34	29.8%
Vital bleaching		
Hydrogen peroxide 10%	11	9.6%
Hydrogen peroxide 15-22%	12	10.5%
Hydrogen peroxide more than 22%	66	57.9%
Carbamide peroxide 15-22%	14	12.3%
Carbamide peroxide more than 22%	11	9.6%
Non-vital bleaching		
Sodium perborate + water or HP	53	46.5%
HP 10-22%	16	14.0%
HP more than 22%	33	28.9%
CP more than 22%	12	10.5%
Does light have an effect on bleaching?		
Yes	75	65.8%
No	39	34.2%

Among the various treatment modalities for vital bleaching, hydrogen peroxide more than 22% (57.9%) was the preferred treatment of choice, whereas HP 10% and CP >22% were the least preferred. The combination of sodium perborate with water or hydrogen peroxide (46.5%) was the preferred treatment of choice for non-vital bleaching; the least preferred treatment modality for non-vital bleaching was CP more than 22% (10.5%). The majority of the dentists (65.8%) believed that light had an effect on bleaching. (Fig. 1)



About 58.6% of the dentists possessed the light bleaching unit in their dental office. There was a significant association between the time since graduation and the preference for in-office bleaching (P=0.01) [Table 2]. There was no significant association between the time since graduation and the material used for vital or non-vital bleaching (P>0.05) [Table 3].

Table 2. Association between choice of the vital bleaching technique (at-home or in-office) and the time since graduation

Time since graduation	At-home	In-office	Both	P value
Less than 5 years	17	13	12	0.01
6-10 years	4	24	8	
More than 10 years	1	21	14	

Table 3. Association between materials used for vital and non-vital tooth bleaching therapies and the independent time since graduation

	6-10 years	Less than 5 years	More than 10 years	P value
Vital bleaching				
Hydrogen peroxide 10%	7	2	2	0.145
Hydrogen peroxide 15-22%	12	0	0	
Hydrogen peroxide more than 22%	17	23	26	
Carbamide peroxide 15-22%	0	11	3	
Carbamide peroxide more than 22%	6	0	5	
Non-vital bleaching				
sodium perborate + water or HP	25	17	11	0.473
HP 10-22%	11	5	0	
CP more than 22%	6	8	25	
HP more than 22%	0	6	0	

Discussion

The authors found that in-office bleaching was the preferred method by the majority of the dentists, followed by the preference for a combination of at-home and in-office treatment methods. This is supported by the fact that dentists being more educated on bleaching techniques during their undergraduate period are more confident and more inclined to perform bleaching treatments in their professional clinical practice. [8] However, a plethora of studies has refuted this fact by showing dentist preferring at-home therapies. [5, 7, 9, 10] The results of our study hence paves the way for further re-thinking of the present trends among dentists for bleaching therapies, which needs further probing.

It was observed by the authors that carbamide peroxide more than 22% was the least preferred modality for both vital and non-vital therapies among the dentists. This

confirmed that the dentists were abreast and convinced with the scientific evidence that recommends limited usage of this modality. A study has shown that carbamide peroxide can cause damage to the dental substrate bond to resin tags, in other words, the hybrid layer, which is mainly responsible for the mechanisms of adhesion between teeth and resin composites can be hampered. [11] The study suggested some protocols to minimize the deleterious effects of bleaching agents on the bond interface.

Carbamide peroxide (CP) is commonly used for at-home treatment modalities. This possible link between at-home therapies and carbamide peroxide might have deteriorated the usage of both. The authors also observed that with the increase in clinical experience, the probability of suggesting in-office therapies was higher. This could probably suggest the important role played by clinical experience in decision-making. Use of at-home office therapies has been shown to produce an increase in the superficial porosity of enamel after treatment with 10% CP for 12 hours of daily application over four weeks. [12] Another study evaluated the effects of 10% PC used in an at-home whitening technique on dental enamel surface microhardness and found that the bleaching agent produced enamel surface modifications demonstrated by the decrease of microhardness values that started during the first week of CP application. Injury to the enamel surface was intensified after 14 days of treatment. [13] McCraken and Haywood showed that the calcium loss after eight hours of at-home bleaching corresponds to the erosion caused by cola-based soda applied for 2.5 minutes. [14]

Combination therapy was the second preferred option among the dentists. This probably could be attributed to the belief among the dentists that the treatments in-office and at-home individually weren't as effective as the combination therapy. By using the combination technique, it has been shown that clinicians can reduce the time required to complete tooth-whitening treatment. [10] Using the correct tray design and improved chemical formulations of tooth whiteners may reduce gingival and tooth sensitivity, thus increasing safety. The combination therapy has been proven successful as effective teeth whitening therapies. [10, 16]

This study has thrown light on the belief that dentists believed that light activated sources had an impact on bleaching. A recent study shows that in-office therapies increased the short-term results of bleaching and patient demonstrated satisfaction with the light activated in-office therapies. [17] A plethora of studies has advocated the benefits of light activated bleaching. [18, 19, 20] However, a few other studies have refuted the idea that light activation accelerates bleaching effects. [21, 22] Nevertheless, we should consider the fact that majority of the dentists possessing such light units for bleaching in their dental office might be a factor of bias for them to consider light to be effective for bleaching. Further, probing into this through longitudinal studies is essential. The limitation of our present study is that we have considered the sample collection at a cross-sectional level and hence further studies should be

conducted with a larger sample size and longitudinal study design to conclude definitively.

In-office bleaching was preferred over at-home therapies; HP >22% and sodium perborate with water or HP were chosen as first treatment options to manage discolored vital and non-vital teeth, respectively. The time in clinical practice had an effect only on the choice of vital bleaching technique. Hence, this study has thrown light on the fact that trends for treatment strategies are liable to change and can challenge the commonly said.

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