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ORIGINAL ARTICLE

Dentists' preference for Vital and Non-vital Tooth Bleaching Material in Teaching Institutions of Multan

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ABSTRACT

Objective: The objective of this study was three fold; to investigate the preference of dentists regarding the technique for vital and non-vital tooth bleaching, to find out the materials used for vital and non-vital tooth bleaching and to evaluate the influence of post-graduate training, working place and clinical experience on techniques and material used.

Methodology: A cross sectional study was carried out using a questionnaire with dentists working in three teaching institutes of Multan, Nishtar Institute of Dentistry (NID), Bakhtawar Amin Medical & Dental College (BAMDC) and Multan Medical & Dental College (MMDC). A total of 170 questionnaires were distributed and 154 recovered, at a response rate of 90.5%. Information about post-graduate training, working place and clinical experience was obtained. The information regarding technique and material used for vital and non-vital tooth bleaching was also collected. Data were analyzed using SPSS version 22 and frequencies and percentages were calculated along with association between the treatment options and other variables.

Results: Majority of the dentists 81.8% and 75.3% preferred in-office technique for vital and non-vital tooth bleaching respectively. For vital tooth bleaching, 31.8% selected HP 6% and 28.4% opted CP10-22%. For non-vital tooth bleaching, 34.8% selected SP mixed with water/HP and 26.6% opted HP37%.

Conclusion: Clinical experience and working place significantly influenced the bleaching technique for vital teeth not for the non-vital. No significant influence of post-graduation, clinical experience and working place was found on material used for vital or non-vital bleaching.

Key Words: Vital tooth bleaching, Non-vital tooth bleaching, Hydrogen peroxide, Carbamide peroxide, Sodium perborate

INTRODUCTION

Esthetics has been very important in ancient and modern society. Quality of social life can be affected by discolored teeth.[1] The most aspect of satisfaction with teeth appearance is whiter and well aligned teeth.[2, 3] Studies have shown that treatment of unaesthetic teeth has been highly demanding in each circle of life.[4] In a study on university students, it was found that most of them desired to get esthetic treatment and many had already got teeth bleaching.[5] Another study also found the similar results.[4]

Bleaching of teeth is one of the most popular dental treatments. The materials used for the purpose have concentration ranging from 10% to 37%. The main ingredient of such products is hydrogen peroxide (HP) or carbamide peroxide (CP) which produces HP and urea. These chemicals are oxidizing agents and can be used to bleach vital or non-vital teeth simultaneously, depending on their concentration, whereas, sodium perborate (SP) is the material exclusively used to bleach non-vital teeth.[6-8] There are two bleaching techniques; A-home and In-office. In former technique 10%-22% CP and 6% HP are used at home by the patients under supervision of dentist, whereas, later is characterized by the application of more than 30% CP or HP by dentists in their office.[9]

The color of vital and non-vital teeth can be improved by the use of bleaching agents.[10] This improvement may have a positive impact on quality of life in terms of appearance and confidence.[11] Regarding the two bleaching techniques, a systematic review found both equally effective.[12] Along with their benefits, both the techniques have same kind of side effects, which are tooth sensitivity and gingival irritation.[13, 14]

Although there are many bleaching agents and techniques in practice, their choice is mostly relying on dentists' level of education, working sector and clinical experience. In this regard, a survey showed that the choice of bleaching protocols for vial and non-vital teeth was influenced by the above cited parameters.[15] Therefore, the aim of the present study was to know the dentists' choice for vital and non-vital tooth bleaching and objectives were to investigate their choice of bleaching technique and material used for the purpose. Moreover, it was evaluated whether post-graduate training, working place and clinical experience affected these options or not.

METHODOLOGY

A cross sectional study was performed in three teaching Dental Institutes (NID, BAMDC & MMDC) in the city of Multan from 11th to 18th Feb, 2021. Non-probability convenience sampling was done in this study. A total of 213 dentists, registered with Pakistan Medical and Dental Council (PMDC), working in above mentioned institutions constituted the population of study. The sample size was 154. The calculated sample size using 'Raosoft' software

was 146 by keeping confidence level 95%. A total of 170 questionnaires were distributed and 154 were recovered after two consecutive visits. The response rate was 90.5%. Data were collected using a close-ended questionnaire. The questionnaire included demographic data (gender, post-graduate training, working place & clinical experience) and information about the technique and material used for vital and non-vital tooth bleaching. Data were analyzed by using Statistical Package for Social Sciences (SPSS) version 22. Frequencies of the variables were calculated. Descriptive analysis was performed and the association of clinical experience, post-graduate training, & working place with treatment modalities was tested with Chi-square test. A significance level of p≤0.05 and confidence interval of 95% was calculated.

RESULTS

From the distributed questionnaires (170), recovered were 154. The data missed was 9.4 % due to no return of the questionnaire, absence of the participants from the workplace and not performing the bleaching. The frequencies and percentages of studied variables are shown in Table 1.

Table 1: Frequencies and percentages of studied variables (n = 154)

Variables		Frequency = n (Percentage)
Gender	Male	79 (51.3)
	Female	75 (48.7)
Clinical experience	≤5 years	59 (38.3)
	6-10 years	44 (28.6)
	11-20 years	38 (24.7)
	>20 years	13 (8.4)
Post-graduate training	Yes	74 (48.1)
	No	80 (51.9)
Working Sector	Public	86 (55.8)
	Private	68 (44.2)
Vital tooth bleaching protocol	At-home	28 (18.2)
	In-office	126 (81.8)
Non-vital tooth bleaching protocol	At-home	38 (24.7)
	In-office	116 (75.3)
Material for vital bleaching	*CP 10-22%	44 (28.4)
	CP37%	27 (17.5)
	*HP 6%	49 (31.8)
	HP 37%	34 (22.1)
Material for non-vital bleaching	CP 10-22%	39 (25.3)
	CP37%	22 (14.3)
	HP 37%	41 (26.6)
	*SP+water/HP	52 (34.8)

*CP = Carbamide peroxide *HP = Hydrogen peroxide *SP = Sodium perborate

Table 2 Association of clinical experience with material and technique used for vital and non-vital bleaching

Material for vital bleaching	Experience (years)				P value
	<5	6-10	11-20	>20	
CP 10-22%	20	8	12	4	0.12
CP 33%	14	5	7	1	
HP6%	14	22	10	3	
HP37%	11	9	9	5	
Material for non-vital bleaching					
CP 10-22%	13	11	11	4	0.13
CP 33%	9	4	7	2	
HP37%	18	6	13	4	
SP+water/HP	19	23	7	3	
Vital bleaching technique					
At-home	8	10	4	6	0.02*
In-office	51	34	34	7	
Non-vital bleaching technique					
At-home	14	13	6	5	0.316
In-office	45	31	32	8	

* Significant *p*-value

In relation to gender, majority (51.3%) were male. Most of the participants (38.3%) had clinical experience of up to 5 years. Of the total participants, 48.1% had been enrolled in post-graduation course or completed the training. Regarding the technique for bleaching vital and non-vital teeth, most of the dentists (81.8% and 75.3% respectively) selected the in-office technique. Most of the participants (31.8%), selected HP 6% for vital bleaching. For non-vital bleaching SP in combination with water/HP was opted by majority (34.8%).

Table 2 shows the association of clinical experience with material and technique used for vital and non-vital bleaching. An association was found between clinical experience and bleaching technique for vital teeth. The participants having experience of 11-20 years preferred in-office technique over at-home one significantly more than those having <11 or >20 years of experience (p = 0.02). No significant association of clinical experience was found with bleaching technique for non-vital teeth and material used for vital or non-vital bleaching.

An association, given in table 3, was found between working sector and bleaching technique for vital teeth. The participant who were in public sector opted in-office technique significantly more than those working at private sector (p = 0.01).

Table 3 Association of post-graduation and working sector with material and technique used for vital and non-vital bleaching

Material for vital bleaching	Post-graduation		P value	Working sector		P value
	Yes	No		Public	Private	
CP 10-22%	21	23	0.99	26	18	0.51
CP 33%	13	14		12	15	
HP6%	23	26		30	19	
HP37%	17	17		18	16	
Material for non-vital bleaching						
CP 10-22%	17	22	0.89	22	17	0.83
CP 33%	10	12		14	8	
HP37%	21	20		23	18	
SP+water/HP	26	26		27	25	
Vital bleaching technique						
At-home	13	15	0.84	10	18	0.01*
In-office	61	65		76	50	
Non-vital bleaching technique						
At-home	16	22	0.39	21	17	0.93
In-office	58	58		65	51	

* Significant *p*-value

DISCUSSION

To know the choice of dentists regarding different procedures and materials used is helpful to understand the trends in clinical practice. One of those procedures is tooth bleaching and materials used for the purpose.[16, 17] The present study showed that dentists' characteristics such as clinical experience and working place influenced the dentist's decision regarding selection of at-home or in-office vital tooth bleaching. In this study, the most participants preferred in-office bleaching technique over at-home both for vital and non-vital teeth. Although it was shown by a systematic review that both techniques were effective [12], a study found in-office technique most preferred [18] supporting the present one. Contrary to present study, at-home technique was found to be the most preferred.[15]

Regarding material for vital bleaching, HP6% was preferred by the majority. This might be due to its association with less sensitivity during treatment depending upon lower peroxide concentration.[19] Moreover degradability of bleaching material having lower peroxide concentration may be less than those having higher concentration, resulting in more effectiveness [6]. For non-vital bleaching, the most preferred material was sodium perborate mixed with water or HP. This was in agreement with a previous study.[20] This preference might be due to no longer indication of hydrogen peroxide into the pulp chamber for non-vital bleaching, because of possible attribution to external cervical resorption.[21] Contrary to present study, HP 37% was the most preferred material for non-vital bleaching, found a in a study.[18]

It was identified in present study that the participants having experience 11-20 years preferred in-office technique for vital tooth bleaching significantly more than those having experience less than 11 years or more than 20 years (p=0.02). This corroborates with Brazilian dentists, where dentists with greater experience indicated more in-office than younger ones.[15] On the other hand, findings of a study [18] are contrary to present one that might be due to the usage of lower concentrations of peroxides considered safe for at-home technique.

The participants working in public sector opted in-office technique significantly more than those working in private sector (p=0.01). The choice for this technique could be related to the higher supervision by the dentist. No significant association of post-graduation and working sector was found with material used for vital or non-vital bleaching and technique for non-vital bleaching.

The limitation of the study was that the surveyed dentists belonged to teaching institutions. Non-teaching dentists could be studied. Thus, the present study found that the clinical experience and working sector influenced dentists' preferences of technique for vital tooth bleaching. In-office bleaching using hydrogen peroxide at lower concentrations was preferred.

CONCLUSION

Within the limitations of this study, following conclusion may be drawn;

- In-office technique was preferred over at-home both for vital and non-vital bleaching.
- Hydrogen peroxide 6% and sodium perborate mixed with water were the material of choice for vital and non-vital tooth bleaching, respectively.
- Dentists having experience of 11-20 years and working in public sector preferred in-office technique for vital teeth more than those having <11 or >20 years and working in private sector, respectively.

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