

PERCEPTION AND KNOWLEDGE OF ADULT SAUDI PATIENTS ABOUT TOOTH DISCOLORATION AND VITAL BLEACHING

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ABSTRACT:

Aim: This cross-sectional questionnaire-based study aimed to evaluate the knowledge and attitude of adult Saudi patients toward tooth discoloration and vital tooth bleaching.

Materials and Methods: A questionnaire containing twenty questions was distributed to 120 adult patients visiting the Riyadh Colleges of Dentistry and Pharmacy Teaching Hospital. The questions were designed to evaluate patients' knowledge about tooth discoloration and vital tooth bleaching.

Results: Out of the 120 questionnaires distributed, 104 were completed and returned (58 males and 46 females). The mean age of the participants was 38.6 years. Results revealed that majority of the participants were unsatisfied with the color of their teeth (70.2%). Females and young participants showed a higher level of dissatisfaction about the color of their teeth compared with males and older age-groups ($p < 0.05$). The most desired aesthetic treatment by the participants was bleaching (58.65%). Aging, smoking, and tea and coffee were the most frequent causes of tooth discoloration mentioned by the participants. Only seventeen patients (16.34%) were aware that excessive fluoride in drinking water during tooth development may cause discoloration. The main source of information about tooth bleaching was the media (28.8%). Majority considered bleaching to be a safe procedure (65.4%), and sensitivity was mentioned to be a side effect by 45.2% of the participants. The preferred technique for the respondents was in-office bleaching (42.3%), and the major reason for this was the fast whitening effect.

Conclusion: Most of the patients are not satisfied with the color of their teeth, and their most desired aesthetic treatment is bleaching. Patients' knowledge about tooth discoloration is more concentrated on extrinsic etiology, and their knowledge about tooth bleaching seems to be inadequate in many aspects. Social media could be a suitable channel for special educational programs designed by dental professionals to increase the general population's awareness of tooth discoloration and bleaching.

Keywords: aesthetic satisfaction, dental bleaching, tooth discoloration, knowledge, perception



INTRODUCTION:

The demand for aesthetic smile has grown over the last few years. Dental bleaching is considered the most conservative and biologically safe treatment for discolored teeth ^[1]. Tooth discoloration is a frequent dental finding, associated with clinical and aesthetic problems. It differs in etiology, appearance, composition, location, severity, and firmness in relation to the tooth surface ^[2].

Tooth discoloration can be caused by extrinsic or intrinsic staining. Dietary sources such as tea, coffee, mouthwash containing chlorhexidine, and substances such as tobacco have been implicated. They cause a brown to black stain that appears darkest in the gingival third of the tooth. Most extrinsic tooth stains can be removed by routine prophylactic procedures. With time, these stains darken and become more persistent, but they are still highly responsive to bleaching ^[3-4].

The use of chlorhexidine antibacterial plaque-inhibiting mouth rinses has shown to chemically alter the acquired pellicle, resulting in the formation of brown integuments on the tooth surface [2,4].

Intrinsic tooth discoloration can be either a genetic or an acquired abnormality. It usually occurs because of a change in the structure and appearance of the dentine or enamel. Genetic conditions such as amelogenesis imperfecta, dentinogenesis imperfecta, and dentine dysplasia have been associated with intrinsic staining, which occurs during the tooth development stages. They result in a characteristic yellowish-brown and bluish-brown staining [2,4]. Acquired staining results from metabolic, traumatic, idiopathic, iatrogenic, and age-related causes. Traumatic injury to the tooth surface due to mechanical impact causes pulpal hemorrhage, which causes a reddish-purple staining on the pulp and dentine and, with time, transforms into a gray-brown stain [5].

Tetracycline staining, which is characteristic in children born of mothers who were on tetracycline medication at the time of their pregnancy, is intrinsic. These children develop a brown staining on most of their deciduous and permanent teeth. Age-related tooth staining is also observed. With increased age, a yellow discoloration is observed on the tooth surface [1,2,6].

Dental fluorosis is a developmental disturbance of the dental enamel caused by excessive exposure to high concentrations of fluoride. It is characterized by an opaque white appearance in the mild stage and a brown

stain in the moderate stage, leaving a pitted, rough enamel that darkens over time in severe fluorosis. The main cause of dental fluorosis is overexposure to high levels of fluoride in drinking water and fluoridated mouth rinses and dentifrices. In a study conducted in Saudi Arabia in 1997 by Alshamary et al., the authors concluded that fluorosis is present in 24.6% of the population in Saudi Arabia [7].

Endodontic materials have been found to cause tooth discoloration, especially if contaminated with blood [8]. Vital tooth bleaching can be performed at home or in the office. In-office bleaching agents contain high concentrations of whitening agents (30%–35% hydrogen peroxide), whereas at-home bleaching agents contain low concentrations of whitening agents (10%–20% carbamide peroxide) used in a custom tray [3]. Heywood and Robinson [3] considered Night guard vital bleaching as the most cost-efficient, user-friendly, patient-accepted method of bleaching teeth available to the profession and is safe and effective.

Sensitivity is a common side effect of vital tooth bleaching. It is usually related to microscopic enamel defects and subsurface pores and the ability of the whitening agent to penetrate to the pulp [9]. Many preoperative conditions can cause pain during and after whitening treatment. One of them is dentin hypersensitivity before whitening treatment [6,10]. According to Haywood and Heymann [11], tooth sensitivity is attributed to the freely diffusible nature of the material rather than the pH of the solution. Peroxide solutions have long been determined to flow freely through the

enamel and dentin. This free movement is due to the relatively low molecular weight of the peroxide molecule [3,4,11]. Its prevalence has been reported to lie between 11% and 93% [12,13,14,15,16].

In a study conducted by Basting, a higher prevalence of tooth sensitivity was observed in 71.4% of the volunteers who used a 20% carbamide peroxide home-use bleaching agent, which may be ascribed to the peroxide concentration and/or the time/length the agent was in contact with the dental structures [16].

Most of the studies that compared the incidence of sensitivity between in-office and at-home bleaching found that both techniques provide comparable levels of tooth color improvement with no significant difference in postoperative sensitivity [17,18,19]. Faster color regression was found in power bleaching in some studies, even though color regression to the baseline of the teeth in both power and at-home was the same after 6 months [19].

Bernardon et al. [20] found no difference in the bleaching result with regard to sensitivity and durability at a 6-month post treatment interval. They compared at-home bleaching with 10% carbamide peroxide with in-office bleaching using 35% hydrogen peroxide. Furthermore, Mondelli et al. demonstrated that in-office bleaching with or without light activation presented similar results, but the time required was shorter with light activation [21].

Gingival and soft-tissue irritation is also a common but temporary side effect. It is usually related to high concentrations of whitening agents or long-term at-home use. A more powerful in-office bleaching

(30%–35% hydrogen peroxide) can easily produce soft-tissue burns, turning the tissue white. In general, these tissue burns are reversible with no long-term consequences [22].

Bleaching is considered safe for the dental pulp. Fugaro et al. evaluated the histological changes in the dental pulp after night guard vital bleaching with a 10% carbamide peroxide gel. The findings indicated that the mild histological changes sometimes observed after bleaching tend to resolve within two weeks after treatment, and they have no effect on the overall health of the pulp tissue [23]. Inflammation happens because the bleaching agent dissolves rapidly through the cement-enamel junction into the pulp, thus resulting in reversible pulpitis [24].

Dissatisfaction of dental appearance and tooth color is a common finding in different studies that investigated patients' perception of dental aesthetics. In a study conducted by Tin-Oo et al., 52.8% of the participants were unhappy with their dental appearance, 56.2% were unhappy with their tooth color, and 48.1% desired tooth bleaching [25]. In a study with secondary school females in Saudi Arabia, Alsadhan et al. [26] found that more than half of the participants wanted to bleach their teeth; and in a more recent study by Al-Zarea, 65.9% of Saudi adults were found to be unhappy with the discoloration of their teeth [27].

In Alsadhan's study in Saudi Arabia, nearly half of the respondents knew that the aim of bleaching is to whiten the teeth, 37% correctly stated the causes of tooth discoloration, and 22.5% identified the side effects of bleaching. Only 3.6% of the

respondents knew the action of bleaching agents, while 8.5% knew the expected duration of the bleaching results [26]. Akarslan reported that more than half of the patients in his study in 2009 were unhappy with the color of their teeth. The most desired treatment for the improvement of dental aesthetics was bleaching (49%). Gender, age, and educational level had an impact on the general appearance of dental aesthetics as female and young individuals tended to be more unhappy with the color of their teeth [28].

In a study conducted in Hong Kong, 80.2% of young adults perceived their teeth to be not white enough. Age was found to be a significant predictor of increased demand for tooth bleaching [29].

In another study in Malaysia, the most common reasons cited for bleaching treatment were to remove coffee and tea stains (70%) and cigarette stains (16.7%). Of these patients, 73.3% were satisfied with the results achieved after bleaching. However, majority of the patients (59.6%) were unsure of the safety of bleaching products/procedures, and only 18.2% of them had tried dental bleaching before [30].

In a study that investigated the impact of popular media on cosmetic dentistry, Theopald et al. found that popular media has impact on the demand for various aesthetic dental procedures since majority of the participants perceived an increased demand for tooth whitening (77.8%) and veneers (54.8%) [31].

The main source of bleaching knowledge was varied according to different studies. Family and friends [26], advertisements on

electronic media [30,31], and television [29] were the main sources of information.

MATERIALS AND METHODS:

In this cross-sectional survey, a closed-ended questionnaire containing fifteen questions was randomly distributed to 120 adult patients in Riyadh Colleges of Dentistry and Pharmacy in Riyadh City. In addition to demographic data, the questionnaire had three parts: the first part investigated patients' level of satisfaction of their smile and tooth color, while the second and third examined the participants' level of knowledge on tooth discoloration and vital tooth bleaching.

The questionnaire was validated using a pilot test, in which the questionnaire was distributed to ten patients, who were asked to mark areas of un-clarity and to report their views with regard to the questions. Cronbach's alpha was used to measure internal consistency (Cronbach's alpha =0.9).

Statistical Analysis:

Descriptive analysis was performed to present an overview of the findings about the characteristics of the population and their level of satisfaction and knowledge about tooth discoloration and vital tooth bleaching. The Statistical Package for Social Sciences Software version 20.0 (IBM SPSS) was used for data analysis. Chi-square and Fisher's exact tests were used to find the relationship between aesthetic perception and knowledge about tooth discoloration and bleaching and specific patient factors, such as age, gender, level of education, and previous experience of bleaching. The confidence level was set at $p \leq 0.05$.

Ethical Considerations:

The study was conducted after it was

approved by the Ethical Committee at the research center of Riyadh Colleges of Dentistry and Pharmacy. The aim and benefits of the study were explained to all patients, and they were informed that their act of completion of the questionnaire would be considered an expression of their consent to participate in the study.

RESULTS:

Out of the 120 questionnaires distributed, 104 were completed and returned (58 males and 46 females). The mean age of the participants was 35.6 years (SD +/- 11.2). Results revealed that majority of the participants were unhappy (70.2%) with the color of their teeth, and they desired to undergo aesthetic treatment to correct their aesthetic problem. Females and young individuals showed a statistically

significantly higher level of dissatisfaction of the color of their teeth compared with males and older age-groups ($p < 0.05$). Educational level had no influence on patients' level of satisfaction (**Table 1**). The most desired aesthetic treatment selected by the participants was bleaching, followed by ceramic veneers, and lastly, cleaning and polishing (**Figure 1**).

Only 17 (16.34%) patients in this study had prior experience in vital bleaching. Majority of those who underwent bleaching treatment were initially satisfied with the results (14 out 17), but most of them observed color regression after a few months. For those who had not yet had this procedure, its cost and their fear of side effects were their main reasons for not trying tooth bleaching.

Table 1. Level of satisfaction of tooth color in relation to demographic data of the participants

	N (%)	Satisfied (%)	Unsatisfied (%)	Sig.
Gender				
Male	58 (55.76)	20 (34.5)	38 (65.5)	0.01
Female	46 (44.24)	11(23.9)	35(76.1)	
Age-groups				
18–29	53 (51.0)	11(20.75)	42(79.25)	0.03
30–44	29(27.9)	11 (37.9)	18(62.1)	
>45	22(21.1)	9 (40.9)	13(59.1)	
Level of education				
Intermediate school and below	19 (18.3)	6(31.6)	13 (68.4)	0.9
High school	36 (34.6)	11(30.5)	25 (69.5)	
University and above	49 (47.1)	14(28.6)	35 (71.4)	
Total	104	31 (29.8)	73 (70.2)	

The patients were asked to specify what they thought were the causes of tooth discoloration out of the different

etiological factors; and smoking, tea, and coffee were the most commonly mentioned answers. Only seventeen patients (16.34%) were aware that excessive fluoride in drinking water during tooth development may cause discoloration, and mouthwashes were mentioned as potential causes of tooth discoloration by only 13.46% of the participants. Furthermore, only five patients could name the drug that could cause tooth discoloration if given to a child or pregnant woman. Patients' knowledge about different causes of tooth discoloration are presented in **Table 2**. In the section investigating patients' knowledge about tooth bleaching, about half of the respondents (51%) rated their level of knowledge as good, 19% rated their knowledge as fair, 17% said they had poor knowledge, and 13% believed that they had excellent knowledge about the procedure. The main source of information about tooth bleaching among the participants is presented in **Figure 2**

in drinking water		
Hereditary causes	11(10.6)	93(89.4)
Some antimicrobial mouthwashes	14(13.5)	90(86.5)
Bacteria playing a role in tooth discoloration	9(8.7)	95(91.3)
Endodontic materials	11(10.6)	93(89.4)

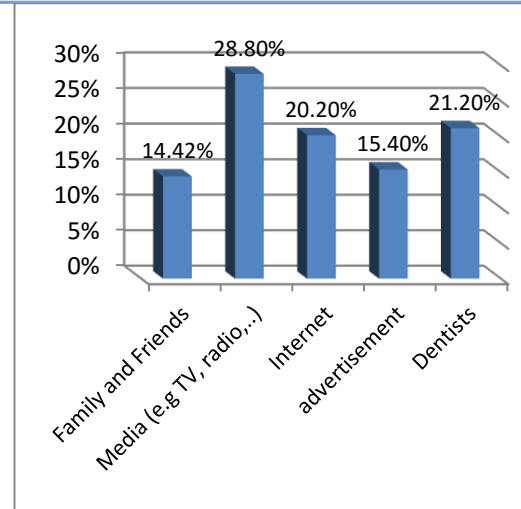


Figure 2. Source of information about bleaching among participants

Majority of patients considered bleaching to be a safe procedure (65.4%), 16.3% perceived it as not safe, and 18.3% were not sure about its safety (**Figure 3**).

Table 2. Patients' knowledge about different etiologies of tooth discoloration

Which of the following could cause tooth discoloration?	Known n (%)	Don't know n (%)
Drugs during childhood	19(18.3)	85(81.7)
Illness during childhood	33(31.7)	71(68.3)
Aging	91(87.5)	13(12.5)
Smoking	86(82.7)	18(17.3)
Tea and coffee	95(91.3)	9(8.7)
Trauma to the tooth	14(13.5)	90(86.5)
Excessive fluoride	17(16.4)	87(83.6)

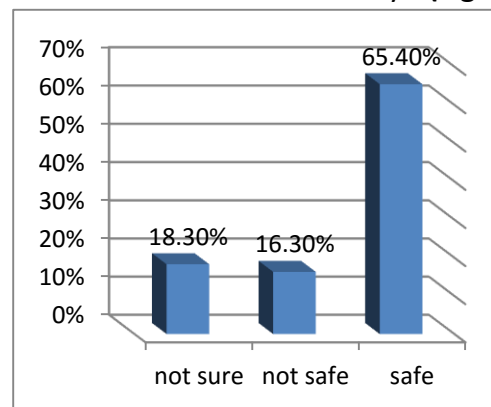


Figure 3. Patients' perception of the safety of tooth bleaching

Different aspects of patients' knowledge and perception of tooth bleaching are presented in **Table 3**. The respondents exhibited good knowledge in some aspects,

such as what should they avoid after bleaching and how length whitening effect would last. Most of the patients (78.85%) are agreed that the whitening color obtained will not last forever.

Most of the respondents lacked knowledge of the mechanism of bleaching and the chemical agents used in this procedure.

About 93% of the patients had no knowledge of the mechanism of bleaching and the names and concentrations of the chemicals used. One more aspect showed a lack of knowledge is the believe in that bleaching could be helpful in all types of tooth discoloration since 68.26% of the respondents believe in this improper concept.

Table 3. Patients’ knowledge of the different aspects of vital bleaching

	Yes/agree (n/%)	No/disagree (n/%)
Have you ever consulted a dentist to gain information about bleaching?	17(16.34)	87(83.66)
I should consult a dentist before starting any type of home bleaching.	42(40.38)	62(59.61)
Bleaching can whiten both the teeth and old restorations.	14(13.46)	90(86.54)
Smoking and drinking tea and coffee should be avoided after bleaching.	93(89.43)	11(10.57)
Bleaching will remove a thin layer from the tooth structure.	9(8.65)	95(91.35)
The color achieved after bleaching will last forever.	22(21.15)	82(78.85)
In case of relapse, the color of the teeth will be darker than the original.	59(56.73)	45(43.270)
Bleaching agents should not come in contact with the gingiva.	68(65.38)	36(34.62)
All types of tooth discoloration could be treated by tooth bleaching.	71(68.26)	33(31.74)
Excessive use of bleaching products could be harmful.	79(75.96)	25(24.04)
Some remedies can be effective for tooth bleaching.	60(57.69)	44(42.31)
Dental bleaching can improve the smell of the oral cavity.	17(16.34)	87(83.66)
I should not rely on the information mentioned in advertisements on tooth bleaching.	88(84.61)	16(15.39)

Most of the patients (73.1%) agreed that tooth bleaching has side effects. Sensitivity was mentioned by 45.2% of the patients, while gingival irritation was considered by 27.9%, and effects on the tooth structure were mentioned by about 14.4% of the

respondents as one of the side effects (**Table 4**). Only 26.9% of them belived that tooth bleaching has no side effects and very few have the concept that tooth bleaching has an effect on old restorations.

Table 4. Dental bleaching side effects known by the patients (more than one selection was allowed)

Side effect	n	%
Sensitivity	47	45.2
Gingival irritation	29	27.9
Effect on the teeth structure	15	14.4
Effect on restorative materials	3	2.9
No side effects	28	26.9

When the respondents were asked about the recommended time intervals before the bleaching process could be repeated, more than half of them (52.88%) answered that they could repeat the procedure once every year, 28.84% believed it could be done every 6 months, and 18.28% had no knowledge of the suitable time interval for when bleaching could be repeated. As regards

the tooth whitening results and patients' expectations, about 21.15% believed that the results would last a lifetime and that no further bleaching would be required, about 47.11% answered that the results would last for a few years and that further bleaching would be required, and 31.74% believed that the results would not last long and that bleaching has a short-term effect and stains would reappear quickly.

The respondents' preferred techniques for dental bleaching are presented in **Table 5**. Majority of the respondents (42.3%) who were interested in trying the bleaching treatment in the future preferred to have it done at the dental office, while only 22.11% preferred at-home tooth bleaching techniques. No statistical difference was found between males and females in their preferred technique for bleaching ($p>0.05$).

Table 5. Patients' preferred bleaching techniques

Bleaching technique	N (%)	Male n (%)	Female n (%)	Sig.
In-office	44 (42.3)	25(43.1)	19(41.3)	0.9
Dentist prescribed home bleaching	23(22.1)	13(22.4)	10(21.7)	0.9
No preference	9(8.6)	4(6.9)	5(10.8)	0.2
I should consult the dentist before selecting a technique	7(6.7)	3(5.3)	4(8.7)	0.12
don't desire bleaching	21(20)	13(22.4)	8(17.4)	0.08
Total	104	58	46	

The participants were asked to identify the advantage(s) they considered for each technique according which their

selection for the preferred technique was based. Most of the patients considered fast results as a major

advantage of the in-office technique (31.73%), followed by dentist supervision, which was mentioned by 18.26% of the patients. The participants most frequently mentioned less cost as an advantage of home technique (33.65%). The advantages of each bleaching technique, according to the patients, are presented in **Table 6**.

Only forty-two of the patients (40.38%) agreed that consultation with the dentist

is very important before any home bleaching can be started. Most of the patients (57.69%) believed that some remedies can be successfully used at home to achieve a tooth bleaching effect. When the patients were asked to name what they know about these remedies, most of them mentioned sodium bicarbonate (baking soda), followed by charcoal.

Table 6. Advantages of each bleaching technique according to the patients

In-office bleaching		
	N	%
Fast effect	33	31.73
Supervision and control of the dentist	19	18.26
More guaranteed results	16	15.38
Others	8	7.69
At-home bleaching		
	N	%
Portability and ease of use	22	21.15
Less cost	35	33.65
Shorter time at the dental office	5	4.80
Others	4	3.84

Most of the respondents (84.61%) believed that the information given in commercial advertisements is not reliable and may be misleading. When the patients were asked about their opinion about the general cost of the bleaching treatment in Saudi Arabia, majority considered it to be high (68.26%), while the remaining rate it as reasonable cost (27.88%) and very few said it is low (3.86%).

DISCUSSION:

This cross-sectional descriptive study was designed to assess patients' satisfaction of dental aesthetics and their knowledge of tooth discoloration and dental bleaching. In this study, data is collected through a questionnaire distributed to patients visiting dental clinics at Riyadh Colleges of Dentistry and Pharmacy Teaching Hospital.

In this study, most of the patients were not satisfied with the color of their teeth (70.2%), and their most desired aesthetic

treatment was bleaching (58.65%). Dissatisfaction of dental appearance and tooth color is a common finding in different studies that investigated patients' perception of dental aesthetics [25,26,27,28,29]. Females and young individuals manifested high levels of dissatisfaction of the color of their teeth and expressed their desire to try tooth bleaching. This finding is similar to those in the study of Akarslan [28] Chan [29] and Ahmad [30]. This could be explained by the fact that females and young individuals are usually more critical and concerned about dental aesthetics.

Currently, advertising and the media in general emphasize the benefits of a pleasant appearance because of its importance in many everyday situations. This fact leads to changes in patients' aesthetic demands and, consequently, in the priority they give to dental treatments.

Educational level had no statistically significant influence on patients' perception of dental aesthetics, which contradicts Akarslan's [28] and Chan's [29] studies, which found educational level to influence satisfaction of dental aesthetics.

Despite this high level of dissatisfaction, only 17 patients (16.34%) in our study population had tried tooth bleaching before. The main reason they did not try this procedure before was its cost, followed by their fear of side effects or relapse after a few months. This percentage is very close to that in Ahmad's study in Malaysia [30], where

only 18.2% of the study population had tried bleaching before. In addition, this result could reflect the possibility that most people are still unsure about the safety of the bleaching procedure, or they have doubts about the durability of the results.

Patients' knowledge about tooth discoloration seems to be more concentrated on extrinsic etiological factors, while their knowledge about the associated effects of some medications, childhood illnesses, and fluoride concentration on tooth discoloration is generally poor. This finding is expected since the media usually concentrates on the external causes of discoloration and little is shown about intrinsic etiology of tooth discoloration. Fluorosis is a common disorder in Saudi Arabia [7], especially in rural areas, where drinking water contains high levels of fluoride. In this study, only 16.3% of the patients were aware that excessive fluoride content in drinking water could cause tooth discoloration. Furthermore, very few were aware that some medications could cause tooth discoloration when taken during tooth development. These results emphasize the need to educate patients about the different aspects, medications, and conditions that could affect the teeth during early childhood.

In this study, the media was the main source of information about tooth bleaching (28.8%), followed by the Internet and dentists, which had comparable percentages. In Alsadhan's study, about 37% of the respondents stated that family and friends were their

main sources of information [26]. In the studies of Ahmad et al. [30] and Theobald et al. [31], advertisements on electronic media were the main sources of knowledge about bleaching. Of the respondents, 84.61% believed that the information given in advertisements was not reliable. When searching the Internet for information about dental bleaching, people find that most of their search results are commercially directed to pages that advertise specific products.

Although published studies suggest that bleaching is a relatively safe procedure, investigators continue to report its adverse effects on hard and soft tissues [10,13]. In this study, about 65.4% of the participants considered the bleaching procedure to be safe, and only 18.3% were unsure about its safety. In Ahmad's study [30], 59.6% of the participants were unsure about the safety of this procedure. Less than half of the patients (45.2%) in this study were aware of post bleaching sensitivity, and 27.9% were aware of gingival irritation as a possible side effect. These percentages are better than those in Alsadhan's study [26]. This affirms the importance of a short explanation given by the dentist before the procedure starts so the patient could expect side effects. Patients should be informed that most of these side effects are reversible and do not have any permanent adverse effects on the tooth or soft tissue.

This study also found that 40.38% of the participants believed in the importance of dentist consultation before any type of bleaching procedure can be started.

Although most dental associations all over the world advocate consultation with the dentist prior to use of any home bleaching products, still they consider low concentrations of hydrogen peroxide to be a safe material for home use. Despite this, however, most authors stress the necessity of applying tooth bleaching products under the supervision of a dental professional. The American Dental Association (ADA) has advised patients to consult their dentists to determine the most appropriate whitening treatment, particularly for those with tooth sensitivity, dental restorations, extremely dark stains, and a single dark tooth. Another misconception observed in the patients' answers is that 68.26% of them believe that bleaching could remove all types of discoloration. This also affirms the importance of dentist consultation since tooth discoloration may be caused by a problem that either will not be addressed by whitening agents and/or may be a sign of a disease or condition that requires dental therapy.

In this study, the patients who preferred bleaching performed at the dental office were more than those who preferred it done at home. Their choice was influenced by the fact that in-office bleaching would give fast results and would be under the control and supervision of the dentist. Most scientific articles have reported similar whitening effects and duration of results for both techniques [9,14,15,16]. The dentist should provide patients with data about these

two techniques, but the final decision should be left with the patients.

However, the respondents demonstrated poor knowledge when they answered questions about the action mechanism of tooth bleaching products and named chemical agents used in the procedure and their concentrations; they exhibited good knowledge about the duration of the whitening effect and what they should avoid after the bleaching process. This is considered acceptable since the chemical compositions and concentrations of therapeutic agents or products are not necessarily memorized or known by the general population.

One interesting finding in this study is that more than half of the participants believed that some home remedies or natural products may play a role in tooth whitening. They mentioned sodium bicarbonate (baking soda) and charcoal as products that can be used for tooth whitening. Patients should be aware that these remedies may have side effects, and the proper channel for getting whiter teeth is through dentists. A scientific investigation is recommended to test the effects and side effects of these materials on the teeth when used at home. With the increasing demand for whiter teeth from patients, there is a potential need for increasing patients' awareness of this nondestructive procedure for improved dental aesthetics. Ideally, information should be delivered to patients by dental professionals either at the dental office

or through properly oriented media programs. One of the limitations of this study is the occupational factor and its effect on patients' perception of dental aesthetics and their desire for bleaching.

CONCLUSION:

- Most patients are not happy with the color of their teeth, and their most desired aesthetic treatment is bleaching. Age and gender are the factors that influence patients' level of aesthetic satisfaction while educational level had no effect on their aesthetic perception.
- Knowledge about tooth discoloration is more concentrated on extrinsic etiologies, and majority of the participants demonstrated poor knowledge about the intrinsic causes of tooth discoloration.
- Most patients considered bleaching to be a safe procedure, and their preferred technique is that which is performed at the dental office. Their awareness of potential side effects and post bleaching instructions is acceptable. Their knowledge about the chemicals used and the mechanism of bleaching is poor, and their main source of information about dental bleaching is the media.
- Special education media programs designed by dental professionals should be implemented to increase the general population's awareness of tooth discoloration and dental bleaching.

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