

# Assessment the Knowledge and Attitude among the Adult Saudi Population at Saudi Arabia about Teeth Bleaching

Eman Abdulaziz Alhablain<sup>1</sup>, Banan Soliman Alganass<sup>1</sup>, Elsayeda Ezzat Yousesif<sup>2</sup>, Ayman Mandorah<sup>3</sup>

<sup>1</sup>BDS, College of Dentistry, Qassim University, Kingdom of Saudi Arabia.

<sup>2</sup>Lecturer, Restorative Department College of Dentistry, Qassim University, Kingdom of Saudi Arabia.

<sup>3</sup>Consultant Endodontist, Assistant Professor, Faculty of Dentistry, Taif University, Kingdom of Saudi Arabia.

Received: July 2019

Accepted: July 2019

**Copyright:** © the author(s), publisher. Annals of International Medical and Dental Research (AIMDR) is an Official Publication of "Society for Health Care & Research Development". It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** This study was carried out to evaluate the knowledge and source of information about teeth bleaching among the adult population of Saudi Arabia. Moreover, to determine the level of satisfaction with the results after bleaching treatment. **Methods:** A cross-sectional study based on a self-administered online questionnaire. A simple random sample comprising of 1126 participants distributed across the five geographical regions of Saudi Arabia (middle, northern, southern, eastern and western). The data obtained was analyzed utilizing frequency distribution and Chi-square test ( $P \leq 0.05$ ). **Results:** There was no statistically significant difference in knowledge of bleaching in relation to geographical regions but the age and gender had a significant influence ( $p=0.000$ ), ( $p=0.001$ ) respectively. Respondents with age group (18- 24 years old) had a higher knowledge than other age groups. In addition, female participants have a higher knowledge than males. 52.6 % of these participants were satisfied with the results achieved after bleaching. **Conclusion:** There still exist certain doubts and misconceptions regarding the awareness of bleaching procedure and products, hence, more effort should be carried out to provide the public with proper information so that any decision made regarding teeth bleaching would be based on sound foundations.

**Keywords:** Saudi Arabia, tooth bleaching, satisfaction, knowledge, aesthetics.

1

## INTRODUCTION

The lightening of the color of a tooth through the application of a chemical agent to oxidize the organic pigmentation in the tooth is referred to as tooth bleaching.<sup>[1]</sup> Tooth discoloration is of two main types, namely, intrinsic and extrinsic tooth discoloration.<sup>[2,3]</sup>

Since teeth color is directly associated with the aesthetic of individuals, thus, numerous studies have tried to evaluate the level of satisfaction of individuals in relevance to dental aesthetic.<sup>[4-6]</sup> Dunn et al.<sup>[7]</sup> reported the factors comprising an attractive smile they found influenced mainly by tooth shade. It was also found that white teeth have been positively correlated with high ratings of self-esteem and confidence, social competence, psychological adjustment and relationship status which confirms the findings of earlier studies.<sup>[8,9]</sup> In addition, Saudi Arabian study conducted in 2013 consist of 220 patients evaluated on visual analog scale scores that ( $6.8 \pm 2.3$ ) for satisfaction with appearance, they

found half of the participants were dissatisfied with tooth appearance and 65.9% were dissatisfied with tooth color.<sup>[10]</sup>

Current teeth bleaching materials are based primarily on either hydrogen peroxide or carbamide peroxide. These bleaching agents are considered to be the least invasive method to treat discolored teeth. Also, it is most conservative and less expensive compared to other treatment options such as veneers and crowns.<sup>[11]</sup> The teeth bleaching market has evolved into three categories: professionally applied (in the dental office); dentist-prescribed/dispensed (patient home-use); consumer-purchased/over-the-counter (OTC) (applied by patients). Additionally, dentist-dispensed bleaching materials are sometimes used at home after dental office bleaching to maintain or improve whitening results.<sup>[12]</sup> The choice of these methods depend on many factors including dentist and patients' preference, the age of a patient, the concentration of the active agent, and treatment time, frequency, and most importantly, type and cause of the discoloration.<sup>[1]</sup>

Until now, few information about public awareness and their perceptions towards teeth bleaching treatment or products are available from Saudi Arabia. The past studies mainly focus on dental patients rather than the public, thus, limiting their generalizability of results to the wider population.

### Name & Address of Corresponding Author

Dr. Eman Abdulaziz Alhablain.  
BDS, College of Dentistry,  
Qassim University,  
Kingdom of Saudi Arabia (KSA).

One study only at Saudi Arabia conducted in 2016 on the general population but limited to Riyadh city;<sup>[13]</sup> hence, the aim of our study was to assess the knowledge about teeth bleaching among the adult population of Saudi Arabia. In addition, to determine the level of satisfaction with the results after teeth bleaching treatment.

## MATERIALS & METHODS

A cross-sectional study based on a self-administered online questionnaire and approved by the ethical committee of a college of dentistry - Qassim University (reference number: EA/505/2017). The data were collected in the period from December 2, 2017, to March 9, 2018. A simple random sample comprising of 1319 participants distributed across the five geographical regions of Saudi Arabia (middle, northern, southern, eastern and western). The exclusion criteria were participants less than 18 years old, dentists and non-Saudis.

The questionnaire of this study was designed based on past study by (R Ahmad et al. 2005).<sup>[14]</sup> It consisted of three parts: Part A: Biographic and demographic data of the participants. Part B: Participants' perception about their oral health and habits. They were asked about the appearance of their teeth stating specifically what was the problem if they were not happy with their teeth. Part C: Participants' information about teeth bleaching and their sources. In addition, we stated three questions to measure the knowledge of teeth bleaching. This consisted of the participant thinking about the importance of dental consultation before using teeth bleaching, the safety of this treatment and did the bleaching material can whiten the crowns or white fillings? According to their answers on past three questions, we gave score ranged from 0 to 3 and the most appropriate answer for each question equaled one point. Last questions asked the participants who had tried using teeth bleaching products or undergone teeth bleaching treatment either in-office bleaching treatment or used self-applicable bleaching agents. Also, did they avoid the colored food and drinks during treatment, and about the level of satisfaction with the results.

The data was entered into the computer in an MS Excel sheet. Statistical analysis of the data was performed using the SPSS Window Version 21 Package program [Chicago, IL, USA]. Frequency distribution and Chi-square analysis were used to determine if there were any relationships and statistically significant differences between the knowledge of teeth bleaching with biographic and demographic factors. The significance level for the analysis was set at  $p \leq 0.05$ .

## RESULTS

A total of 1319 participants responded to the questionnaire. The participants less than 18 years

old, dentists and non-Saudis were excluded from this study. So, the final sample size consisted of 1126 participants [Table 1A] shows the socio-demographic data of the study participants.

**Table 1A: Biographic and demographic of study participants, (n=1126).**

Characteristic	Levels	No.	%
Nationality	Saudi	1126	100
Regions	Middle	780	69.3
	Northern	63	5.6
	Southern	71	6.3
	Eastern	83	7.4
	Western	129	11.5
Gender	Male	601	53.4
	Female	525	46.6
Age	18 - 24	302	26.8
	25 - 34	242	21.5
	35 - 44	246	21.8
	< 45	336	29.8
Marital status	Single	431	38.3
	Married	695	61.7
Level of education	Primary	3	.3
	Intermediate	20	1.8
	High school	199	17.7
	University	904	80.3
Occupation	Student	223	19.8
	Government	558	49.6
	Private	83	7.4
	Free business	34	3.0
	Retired	58	5.2
	Not working	170	15.1

**Table 1B: Participants' perception about their oral health and habits, (n=1126).**

Characteristic	Levels	No.	%
What do you think about your oral health?	Excellent	165	14.7
	Good	720	63.9
	Fair	194	17.2
	Poor	47	4.2
Are you satisfied with your teeth?	Yes	471	41.8
	No	655	58.2
If No, Why?	Color	353	34.2
	Appearance	234	22.7
	Size	67	6.5
	Decay	379	36.7
How many times did you visit the dentist per year?	One per year	328	29.1
	Twice per year	200	17.8
	More than two times per year	203	18.0
	Never	395	35.1
Are you smoker?	Yes	166	14.7
	No	960	85.3
Do you drink coffee and tea?	Yes	1064	94.5
	No	62	5.5

About 14.7 % of the respondents thought they had excellent oral health while 63.9 % believed they had good oral health. 17.2 % of the respondents felt their oral health was fair while 4.2% felt their oral health was poor. Out of 1126 participants, 58.2% were dissatisfied with their teeth due to various reasons as detailed in [Table 1B]. Around 35.1% had never visited a dentist, 14.7 % were smokers and 94.5% drink coffee and tea.

The majority of the participants' responses 96.7% heard about teeth bleaching and 31.10% of them get their information from advertisements, 22.70%

media, 18.70% family, 14.90% dentists, 7.10% television and 5.40% from articles.

The present study revealed there was no statistically significant relationship between the participant's knowledge regarding teeth bleaching in relation to geographical regions which was (p= 0.051) [Table 2]. But the age and gender had a significant influence (p= 0.000), (p= 0.001) respectively. Respondents with age group (18- 24 years old) had a higher knowledge than other age groups [Table 3]. In addition, female participants had a higher knowledge than males [Table 4].

The proportion of respondents who tried teeth bleaching was 33.51% half of them tried it in the clinic and the other were in the home. 51.1% used toothpaste to get whiten teeth, 24.2% used the gel and tray technique and the rest used other techniques to bleach. Most of the participants bleach their teeth to improve esthetic 60.3% and 38.6% to remove staining. Around 11.50 % of the participants used teeth bleaching treatment were highly satisfied with

their result and 52.60% satisfied but 35.9 % were unsatisfied. The highest proportion 69.3% of them regained the color after treatment. 46.3% of them were avoiding the colored food and drinks after treatment for a time, but 53.7% didn't avoid.

Most of these participants 49.5% did not sure about the safety of these bleaching products/procedures. While 14.6% thought it is safe and 35.9% thought not. Gingival inflammation 28.7% was the most side effect of teeth bleaching chosen by participants and 12.8%, 16.8% for teeth sensitivity and teeth weakening respectively. While the 41.6% mentioned other side effects. Regarding the dental consultation before getting teeth bleaching 85.7% of participants agree with it. 9.6 % did not know and 4.7% did not agree. Around 49.2 % of participants did not sure if bleaching material will whiten the crowns and white fillings. While 18.0% thought will whiten and only 32.8% of participants thought it will not.

**Table 2: Level of knowledge about teeth bleaching and its relation to region.**

Level of knowledge	Region												X2 (p)
	Middle (N1=762)		North (N1=59)		East (N1=81)		South (N1=69)		West (N1=118)		Total (N=1089)		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
No	68	8.9%	4	6.8%	8	9.9%	6	8.7%	14	11.9%	100	9.2%	11.324 (p<0.501)
Low	409	53.7%	40	67.8%	39	48.1%	39	56.5%	57	48.3%	584	53.6%	
Moderate	246	32.3%	14	23.7%	29	35.8%	23	33.3%	38	32.2%	350	32.1%	
High	39	5.2%	1	1.7%	5	6.2%	1	1.4%	9	7.6%	55	5.1%	

**Table 3: Level of knowledge about teeth bleaching and its relation to age**

Level of knowledge	Age										X2 (p)
	18 – 24 yrs. (N1=299)		25 – 34 yrs. (N1=235)		35 – 44 yrs. (N1=236)		> 45 yrs. (N1=319)		Total (N=1089)		
	No.	%	No.	%	No.	%	No.	%	No.	%	
No	17	5.7%	23	9.8%	24	10.2%	36	11.3%	100	9.2%	35.101 (p<0.000)
Low	154	51.5%	115	48.9%	117	49.6%	198	62.1%	584	53.6%	
Moderate	104	34.8%	80	34%	86	36.4%	80	25.1%	350	32.1%	
High	24	8%	17	7.2%	9	3.8%	5	1.6%	55	5.1%	

**Table 4: Level of knowledge about teeth bleaching and its relation to gender.**

Level of knowledge	Age								X2 (p)		
	Male (N1= 572)				Female (N1=517)					Total (N= 1089)	
	No.	%	No.	%	No.	%	No.	%			
No	73	12.8%	27	5.2%	100	9.2%	41.53 * (p<0.001)				
Low	330	57.7%	254	49.1%	584	53.6%					
Moderate	151	26.4%	199	38.5%	350	32.1%					
High	18	3.1%	37	7.2%	55	5.1%					

## DISCUSSION

According to our results, the majority of the respondents 96.7% had heard about teeth bleaching and this was expected because of the widespread programs and advertisement about this subject. Analysis of the source of teeth bleaching knowledge revealed that advertisement was the main source of information. This may because of it accessible and repeated frequently, therefore, it is able to reach a wide audience and influence them. This is in agreement with another study.<sup>[14]</sup> The source of knowledge about teeth bleaching that came from the

dentists only 14.90%. This shows that there may be a lack of communication between the dentists and the public on this topic and may the dentists did not play an active part in educating the public about this type of treatment. So, the dental practitioners should explain to the public about this widespread treatment and provide them brief information about it.

The age and gender had a significant influence on the participants' knowledge of teeth bleaching (p= 0.000), (p= 0.001) respectively. Further, this study revealed that teeth bleaching knowledge differed among different age groups. Respondents with age group (18- 24 years old) had a higher knowledge

than other age groups [Table 3], which agrees with the findings of a previous study.<sup>[15]</sup> This could be expected facial attractiveness is an important social standard among adolescent groups and the dental appearance being the first factor related to attractiveness.<sup>[16]</sup> This finding, however, disagrees when compare it to other studies reported no correlation between knowledge of teeth bleaching and age.<sup>[14,17]</sup> This reported difference may be because their studies were conducted with dental patients visiting dental clinics while our study was conducted with the general population.

Females had the highest percentage of correct answers regarding knowledge of teeth bleaching, compared to males 7.2% vs. 3.1% [Table 4], which confirmed the findings of a previous studies that reported significantly higher proportions of knowledge about teeth bleaching in females than males.<sup>[13,18,19]</sup> These results were expected since the desire for beauty and aesthetics increases with females. That's may interpret why the females visiting dental clinics frequently.<sup>[18]</sup>

Since tooth discoloration is directly associated with the aesthetics of individuals, thus, numerous studies have tried to evaluate the level of satisfaction of individuals in relevance to dental esthetics.<sup>[4,20]</sup> A study conducted in Riyadh, showed that the 67.4% were dissatisfied with their teeth color.<sup>[13]</sup> This finding confirmed by other studies conducted in Saudi Arabia, Malaysia and New Zealand that general satisfaction with tooth appearance was influenced mainly by tooth color, followed by mal-alignment and caries.<sup>[17,20,21]</sup> Therefore it was suggested that when planning treatment, dentists should take into account and consider patients' esthetic desires and expectations and considering the functional needs. This will raise the level of patient satisfaction. It's an unexpected as a majority of the participants were unsatisfied with the color of their teeth, only 33.51% of them tried some type of teeth bleaching treatment. Which 50.8% were in the dental clinic and the other was in the home. Around 11.5% of them were highly satisfied while only 13.3 % of the subjects were highly satisfied with the results on the study was conducted at Malaysia.<sup>[14]</sup> In contrast, another study reported 37% of participants were highly satisfied with their results.<sup>[17]</sup> The difference in the satisfaction level between these studies might be due to the variability in products used by the subjects, life style and maintenance.

Respondents demonstrated poor knowledge of the safety of teeth bleaching agents to the teeth, gingival tissue, and oral health. Half of the participants 49.5% they didn't know while 35.9% of them answered the teeth bleaching is not safe, similar to the findings of (R Ahmad et al. 2005,<sup>[14]</sup> and Nora et al. 2015,<sup>[18]</sup>) 59.6% and 39% respectively they were not sure which demonstrated a lack of knowledge concerning safety of teeth bleaching. Many researchers have concluded that teeth bleaching has some negative

effects but they stated that it is a safe procedure if performed professionally under the dentist's supervision.<sup>[22-27]</sup> Teeth sensitivity can occur during or after the bleaching treatment and it is considered a transient painful sensation which usually completely disappears in two to three days.<sup>[23,24,28,29]</sup> Gingival and soft tissue irritation is also common, but a temporary side effect. It is usually related to high concentrations of bleaching agents or too long-term usage at home and can be avoided by proper soft tissue isolation or by individual tray application.<sup>[30-32]</sup> Therefore, the public should request a dental consultation before carrying out any bleaching procedure for avoiding possible adverse side effects and complications. In fact, a majority of respondents in our study had a high level of knowledge 85.7% on the importance of dental consultation before carrying out teeth bleaching procedure and this reflects a good awareness.

## CONCLUSION

Female and young participants were associated with higher levels of knowledge toward teeth bleaching. Half of the participants who used teeth bleaching were satisfied with the result. There still exist certain doubts and misconceptions regarding the awareness of bleaching procedure and products which can be cleared through proper education to the patients visiting dental clinics. Although, more effort should be carried out to provide the public with proper information so that any decision made regarding teeth bleaching would be based on sound foundations. This could be accomplished by providing them with more accurate and basic information through the mass media and professional educational lectures.

Our recommendation, dental schools needs to improve the curriculum to include the teeth bleaching as an applicable conservative treatment option when patients' needs and demands change, rather than merely with advances in commercial developments without reference or evidence-based for a future dentist. In addition, dental practitioners should update themselves and their auxiliary staff to be able to accomplish all aspects of teeth bleaching. Indeed, qualified dentists keen on updating their knowledge of the modern and evidence-based field of cosmetic dentistry with benefits to prevent unnecessary destruction of tooth tissue when other applicable treatment options are available. The future clinical research is needed to measure and determine the attitude and satisfaction of patients during and after use teeth bleaching under supervision by a dentist.

## REFERENCES

1. Roberson T, Heymann H, Swift Jr E. *Sturdevant's Art & Science of Operative Dentistry*. St. Louis, MO: Mosby. Elsevier; 2002.



2. Hannig M, Joiner A. The structure, function and properties of the acquired pellicle. The teeth and their environment. 19: Karger Publishers; 2006. p. 29-64.
3. Alshara S, Lippert F, Eckert GJ, Hara ATJCoI. Effectiveness and mode of action of whitening dentifrices on enamel extrinsic stains. Clin Oral Investig. 2014;18(2):563-9.
4. Azodo C, Ogbomo AJAom, research hs. Self-Evaluated Dental Appearance Satisfaction among Young Adults. 2014;4(4):604-7.
5. Mehl C, Wolfart S, Vollrath O, Wenz H-J, Kern MJJoP. Perception of dental esthetics in different cultures. 2014;27(6).
6. Mehl C, Harder S, Lin J, Vollrath O, Kern MJJoP. Perception of dental esthetics: influence of restoration type, symmetry, and color in four different countries. 2015;28(1).
7. Dunn WJ, Murchison DF, Broome JCJoP. Esthetics: patients' perceptions of dental attractiveness. 1996;5(3):166-71.
8. Matis B, Cochran M, Franco M, Al-Ammar W, Eckert G, Stropes MJOD. Eight in-office tooth whitening systems evaluated in vivo: a pilot study. 2007;32(4):322-7.
9. Kershaw S, Newton J, Williams DJBdj. The influence of tooth colour on the perceptions of personal characteristics among female dental patients: comparisons of unmodified, decayed and 'whitened' teeth. 2008;204(5):E9.
10. Al-Zarea BKJJoD. Satisfaction with appearance and the desired treatment to improve aesthetics. 2013;2013.
11. Zekonis R, Matis B, Cochran M, Shetri SA, Eckert G, Carlson TJOD. Clinical evaluation of in-office and at-home bleaching treatments. 2003;28(2):114-21.
12. Greenwall L. Bleaching techniques in restorative dentistry: An illustrated guide: CRC Press; 2001.
13. Nomay NJJoPH, Epidemiology. Public attitude and awareness towards their teeth color and dental bleaching in Saudi Arabia: A cross-sectional survey. 2016;8(4):45-52.
14. Ahmad R, Ariffin E, Vengrasalam I, Kasim NHAJAoDUoM. PATIENTS' PERCEPTIONS AND KNOWLEDGE ON TOOTH BLEACHING. 2005;12(1):24-30.
15. Al-Sadhan SJSAE. Dental health knowledge, dental visits, and source of information among intermediate school children in Riyadh. 2003;49:835-41.
16. Josefsson E, Lindsten R, Hallberg LR-MJAOS. A qualitative study of the influence of poor dental aesthetics on the lives of young adults. 2010;68(1):19-26.
17. AlAmri M, AlShamrani A, Al Ali M, Abu-Khashab A, Abdul Wahid A, SH. A. DENTAL PATIENTS PERCEPTIONS AND KNOWLEDGE ON TOOTH BLEACHING. Int J of Adv Res. 2017;5(2).
18. Al-Nomay NS, Ahmed AE, Al-Hargan A, Ashi A, Alshalhoub AJJoIOH. Public knowledge of tooth bleaching in Riyadh, Saudi Arabia. 2015;7(12):27.
19. Diklić D, Sever EK, Galić N, Spajić J, Prskalo KJAsC. Attitudes of Students of Different Schools of University of Zagreb on Tooth Bleaching. 2016;50(4):301.
20. Tin-Oo MM, Saddki N, Hassan NJBoh. Factors influencing patient satisfaction with dental appearance and treatments they desire to improve aesthetics. 2011;11(1):6.
21. Theobald A, Wong BK, Quick A, Thomson WJNZDJ. The impact of the popular media on cosmetic dentistry. 2006;102(3):58.
22. Paliska J, Stipetić A, Tarle Z, Ristić M, Ban T, Vujićić N, et al. Colorimetric assessment of different tooth whitening procedures. 2011;45(4):258-67.
23. Klarić E, Profeta I, Matošević D, Tarle ZJASC. Postoperative sensitivity after two in-office bleaching methods. 2011;45(2).
24. Li Y, Greenwall LJBDJ. Safety issues of tooth whitening using peroxide-based materials. 2013;215(1):29.
25. Eva K, Marijan M, Mira R, Ivan S, Katica P, Zrinka TJAcC. Surface changes of enamel and dentin after two different bleaching procedures. 2013;52(4):413-28.
26. Li YJTJotADA. Toxicological considerations of tooth bleaching using peroxide-containing agents. 1997;128:31S-6S.
27. Li YJCoceid. The safety of peroxide-containing at-home tooth whiteners. 2003;24(4A):384-9.
28. Jorgensen MG, Carroll WBJTJotADA. Incidence of tooth sensitivity after home whitening treatment. 2002;133(8):1076-82.
29. Pohjola RM, Browning WD, Hackman ST, Myers ML, Downey MCJJoE, Dentistry R. Sensitivity and tooth whitening agents. 2002;14(2):85-91.
30. Matis BA, Mousa HN, Cochran MA, Eckert GJJQI. Clinical evaluation of bleaching agents of different concentrations. 2000;31(5).
31. Sulieyman M, Addy M, Macdonald E, Rees JJod. A safety study in vitro for the effects of an in-office bleaching system on the integrity of enamel and dentine. 2004;32(7):581-90.
32. Schulte J, Morrisette D, Gasior E, Czajewski MJC. Clinical changes in the gingiva as a result of at-home bleaching. 1993;14(11):1362, 4-6, passim; quiz 72.

**How to cite this article:** Alhablain EA, Alganass BS, Yousefif EE, Mandorah A. Assessment the Knowledge and Attitude among the Adult Saudi Population at Saudi Arabia about Teeth Bleaching. Ann. Int. Med. Den. Res. 2019; 5(5):DE36-DE40.

**Source of Support:** Nil, **Conflict of Interest:** None declared