

Prevalence and public knowledge regarding tooth bleaching in Saudi Arabia

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ABSTRACT

Background: Nowadays, cosmetic dentistry has become one of the most important sections of dentistry because patients care about the appearance of their smile with their general health. Hence, the present study was conducted to find the prevalence of public knowledge regarding tooth bleaching in Saudi Arabia. **Methods:** A cross sectional study with cluster sampling method was carried out in the central, northern, southern, eastern, and western regions of the Kingdom of Saudi Arabia. A modified close ended questionnaire in Arabic/English language was distributed among randomly selected shopping malls and social media (WhatsApp and Twitter) via link in Google Sheet. The survey questionnaires were distributed systematically to individuals entering the malls. The survey items were divided into two sections that included sociodemographic data and knowledge subscales. Regression analysis was done to measure the factors influencing the overall impression of bleaching/tooth whitening. **Results:** The sample comprised a total of 2543 respondents, of whom there were 1190 males (46.8%) and 1353 females (53.2%). When the population was asked the perceived or actual complication of bleaching, it was observed that the majority of those surveyed felt that there was either a real or perceived threat of tooth sensitivity followed by burning of the gums. **Conclusion:** Most of the participants heard about tooth bleaching via advertisements, and most of them have used home bleaching more than professional bleaching. Respondents with frequent dental visits had higher levels of knowledge on tooth bleaching compared to respondents with a lack of dental visits.

Keywords: Knowledge, Saudi Arabia, tooth bleaching, tooth whitening

Introduction

The appearance of the natural teeth and smile is of great concern to a large number of people, especially young females and people working in the entertainment industry, opting for dental cosmetic procedures. This has a great impact on the society as well. Therefore, cosmetic dentistry has become one of the most attractive parts in developing people's self-confidence. To improve

esthetics, bleaching is considered the least invasive method to treat the discolored teeth. Tooth discoloration has been classified into intrinsic and extrinsic discoloration; it could develop either at the time of tooth formation or after tooth formation. The intrinsic staining is caused by high levels of fluoride, intake of drugs such as tetracycline, or by exposure to certain metals during tooth formation. These stains have no response to home-based bleaching agents or abrasives, whereas certain occupational exposure to metals and tar products from tobacco and certain beverages such as tea or coffee can cause extrinsic stains, which many times have responses to home-based bleaching agents.^[1,2]

The opportunities to provide best noninvasive treatment for better esthetics through economical and conservative

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approaches for both patients and clinicians have increased in the recent advancement of restorative and adhesive technology.^[3] One of the advantages of the development in restorative and esthetic dentistry is the invention of tooth bleaching. This tooth bleaching can be accomplished externally on vital teeth or internally on nonvital teeth.^[4] It is either restoring the natural tooth shade or whitening beyond the natural shade, also called tooth whitening.^[6] Moreover, it refers to removing the dirt and debris from the teeth. However, the process of stain removal leaves the enamel crack open and exposed. Some of these cracks are remineralized quickly by saliva, whereas other cracks are filled again with organic debris.^[5]

Hydrogen peroxide (H₂O₂) has been used as a bleaching agent at the beginning of the 20th century. This technique was published by the *American Journal of Dental Science* along with hydrochloric acid microabrasion technique in 1895. People's concerns about their esthetics have increased in recent years due to media and their advertisements. Next, the simplicity of the procedure and speedy result of tooth bleaching lead to improved patient attitudes and feelings toward esthetic dentistry.^[6] Hence, tooth bleaching became one of the most common preferred cosmetic dentistry treatments for making people's teeth look clean and beautiful. Despite the advantages of tooth bleaching, unfortunately, there remain certain side effects such as increasing tooth sensitivity,^[7] irritating the gums and mucous membrane,^[8] weakening the dentin, overbleaching, which leads to enamel damage,^[9] in addition to creating white lesions on the outer surface of the teeth, leading to demineralization. Therefore, the aim of our study is to evaluate the awareness of tooth bleaching among the public in Saudi Arabia.

Materials and Methods

Ethical clearance

The participation in the study was voluntary. Confidentiality of the data was assured throughout the study, and this study proposal was submitted to the Research Center of Riyadh Elm University, Riyadh, Saudi Arabia, with registration number FRP/2019/76 and ethical approval obtained (RC/IRB/2019/146).

Study sample

A total of 2543 participants comprised the study sample.

Study design

This cross-sectional study with cluster sampling method was carried out in the central, northern, southern, eastern, and western regions of the Kingdom of Saudi Arabia (KSA). A modified close-ended questionnaire in Arabic/English language was distributed among randomly selected shopping malls and social media (WhatsApp and Twitter) via link in Google Sheet. The survey questionnaires were distributed systematically to individuals entering the malls. The survey items were divided into two sections that included sociodemographic data and knowledge subscales.

The knowledge questionnaire was designed to ask specific questions that are related to the knowledge of tooth bleaching and oral health awareness.

Statistical analysis

All the data obtained from the questionnaires were exported from the Google Sheet to an excel sheet, and then transferred to the Statistical Package for the Social Sciences software (version 25, IBM software; Chicago, USA) for further analysis. Regression analysis was done to measure the factors influencing the overall impression of bleaching/tooth whitening.

Results

The sample comprised a total of 2543 respondents, of whom there were 1190 males (46%) and 1353 females (53.2%). The social and demographic characteristics of the population are summarized in Table 1.

A majority of the sample (1788) reported that they were aware of the difference between cleaning and bleaching. When asked about their source of information, most of the sample ($n = 1037$) admitted that they had heard of this through advertisements, followed by friends and relatives ($n = 611$), dentists ($n = 567$), and articles ($n = 169$). About 6% of the population ($n = 159$) had never heard of tooth bleaching [Figure 1].

When the experience of the population with bleaching was examined roughly, 21% of the population had undergone professional bleaching at dental clinics and 38% had undergone home bleaching. The use of products varied, and different

Table 1: Demographic profile of the population

Variables	Gender		
	Male, n (%)	Female, n (%)	Total, n (%)
Age group (years)			
18-25	485 (40.76)	635 (46.93)	1120 (44.04)
26-35	347 (29.16)	289 (21.36)	636 (25.01)
35-40	147 (12.35)	230 (17.00)	377 (14.83)
Above 40 years	211 (17.73)	199 (14.71)	410 (16.12)
Socioeconomic group (SR)			
<5000	503 (42.27)	739 (54.62)	1242 (48.84)
5000-10,000	298 (25.04)	330 (24.39)	628 (24.70)
>10,000	389 (32.69)	284 (20.99)	673 (26.46)
Province			
Eastern region	293 (24.62)	381 (28.16)	674 (26.50)
Central region	614 (51.60)	557 (41.17)	1171 (46.05)
Northern region	115 (9.66)	194 (14.34)	309 (12.15)
Southern region	53 (4.45)	108 (7.98)	161 (6.33)
Western region	115 (9.66)	113 (8.35)	228 (8.97)
Last dental visit			
Less than a year	672 (56.47)	838 (61.94)	1510 (59.38)
More than a year	413 (34.71)	456 (33.70)	869 (34.17)
Never	105 (8.82)	59 (4.36)	164 (6.45)
Total	1190 (100)	1353 (100)	2543 (100)

products were used which were reported to induce an actual change in tooth color [Table 2].

When the population was inquired about the frequency of bleaching, most of those who had undergone bleaching had undergone the procedure only once in their lifetime ($n = 653$),

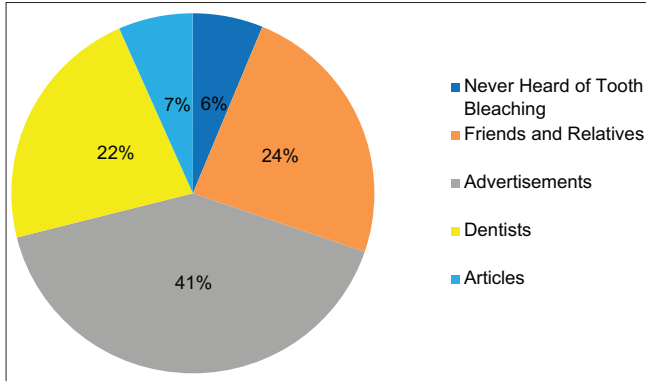


Figure 1: Source of information regarding bleaching

Table 2: Experience of the population with tooth bleaching

Past experience	Response	n (%)
Whitened their teeth at a dental clinic	No	2030 (79.8)
	Yes	513 (20.2)
Whitened their teeth at home	No	1570 (61.7)
	Yes	973 (38.3)
Products used for whitening	No product used	766 (30.1)
	Whitening dentifrice	992 (39.0)
	Mouthwashes/rinses	329 (12.9)
	Chewing gum	43 (1.7)
	Whitening strips	106 (4.2)
	Paint on gels	307 (12.1)
Noticed improvement in tooth color	Never did any whitening	1083 (42.6)
	Whitening dentifrices	423 (16.6)
	In-office bleaching	575 (22.6)
	Home bleaching	200 (7.9)
	Rinses	121 (4.8)
	Chewing gums	26 (1.0)
	Whitening strips	114 (4.5)

Table 3: Frequency and perceived complications of bleaching

Variables	Response	n (%)
Frequency of bleaching	Never used bleaching	1426 (56.1)
	Every 3 months	141 (5.5)
	Every 6 months	81 (3.2)
	Every year	242 (9.5)
	Once in a lifetime	653 (25.7)
Complications	Did not bleach/don't know	306 (12.0)
	Sensitivity of teeth	1313 (51.6)
	No improvement in color	0 (0.0)
	Burning gums	924 (36.3)
	Sensitivity with burning gums	0 (0.0)

as shown in Table 3. When the population was asked about the perceived or actual complication of bleaching, it was observed that the majority of those surveyed felt that there was either a real or perceived threat of tooth sensitivity followed by burning of the gums [Table 3].

The participants were asked to rank their perception of bleaching on a Likert-type scale from 0 to 3, and this score was used as a dependent variable in a regression model to measure the factors influencing the overall impression of bleaching/tooth whitening. It was observed that gender, age group, and socioeconomic factors were found to be significant predictors of the satisfaction with tooth bleaching. Nationality and the province from where the respondent hailed had no significant impact on their overall perception of tooth whitening [Table 4].

Discussion

This study was conducted in order to conclude a relationship of multiple variables including the desire and knowledge of dental bleaching treatment. We collected the information through a survey in Saudi Arabia. The majority of people who filled the survey questionnaires were Saudi citizens, and the most common region was the central region of the KSA (46.2%) and the least was from the southern region with <7%. Nearly 43.9% of the respondents were in the 18–25 years' age group and 14.7% in the 36–40 years' group. Most people in the survey had income of <5000 SR in a month.

In the present study, majority of the sample (1788) reported that they were aware of the difference between cleaning and bleaching, which is in line with another reported study from Saveetha Dental College, Chennai (Lakshmi, July 2017).^[10] When the participants' source of information was inquired, most of the sample ($n = 1037$) admitted that they had heard of this through advertisements followed by friends and relatives ($n = 611$), dentists ($n = 567$), and articles ($n = 169$). Similar observation was reported by four dental care health centers in Riyadh.^[11] About 6% of the population ($n = 159$) had never heard of tooth bleaching [Figure 1].

When the experience of the population with bleaching was examined, roughly 21% of the population had undergone professional bleaching at dental clinics and 38% had undergone home bleaching. Similar findings were also investigated and disclosed by Aldakheel, 2018.^[12] When the population was inquired about the frequency of bleaching, most of them had undergone the procedure only once in their lifetime ($n = 653$). This was also reported by Aldakheel, 2018.^[12] When the population was asked the perceived or actual complication of bleaching, it was observed that the majority of those surveyed felt that there was either a real or perceived threat of tooth sensitivity followed by burning of the gums; similar findings were reported by Aldakheel, 2018.^[12]

A cross-sectional survey was conducted by Ahmed *et al.*^[13] to evaluate the attitude toward in-office versus over-the-counter

Table 4: Factors predicting the overall satisfaction of patients with tooth-whitening procedures

Variables	Unstandardized coefficients		Standardized coefficients β	t	P
	B	SE			
Constant	3.089	0.156		19.850	<0.01*
Nationality	0.027	0.115	0.005	0.231	0.818
Gender	-0.193	0.043	-0.090	-4.548	<0.01*
Age group	-0.143	0.023	-0.149	-6.320	<0.01*
Socioeconomic group	0.082	0.030	0.064	2.708	0.007
Province	0.017	0.018	0.019	0.969	0.333

Dependent variable: Satisfaction. *Statistically significant. SE=Standard deviation

bleaching and to assess the awareness of indications and side effects of over-the-counter dental bleaching products among the residents of Riyadh city, KSA. A close-ended questionnaire was developed that contained an informed consent form and 13 questions. An online version of the questionnaire was created and distributed through emails and social media such as WhatsApp and Facebook. A total of 678 participants responded to the survey. Most of the participants had undergone over-the-counter home dental bleaching rather than in-office dental bleaching and stated that they were influenced by advertisements. The majority reported tooth sensitivity as a side effect of bleaching and unaware of the safety of over-the-counter home dental bleaching products.^[13]

The major strength of the present study is the sample size and limitation is its cross-sectional design.

Importance of knowledge of primary care physicians in their practice

An understanding of the mechanisms behind tooth staining is of relevance to the general dental practitioner. Knowledge of the physiological process involved in shade selection will enable dentists to communicate better with technical staff and also consider patient's opinion in the shade-matching process, prior to cosmetic correction.^[7] When recommending or prescribing oral care products known to cause staining, it is important to warn patients of the potential side effects. Bleaching procedure could be a fast and efficient alternative for tooth whitening, however, prevention of avoidable causes of tooth staining is of paramount importance. The society should be educated to promote good oral health and warn against the excessive use of home-made bleaching products which can damage the tooth enamel, causing sensitivity and associated problems.

Conclusion

Most of the participants heard about tooth bleaching via advertisements, and most of them have used home bleaching more than professional bleaching. Respondents with frequent dental visits had higher levels of knowledge on tooth bleaching compared to respondents with a lack of dental visits.

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Conflicts of interest

There are no conflicts of interest.

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