Original Article

Knowledge and Perception of Saudi High School Boys towards Teeth Whitening/Bleaching

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Abstract

In the current society, esthetic concepts are enhancing that result in an increasing request for esthetic procedures, especially among youngsters. Patients are keen to have a well-aligned smile and demand whiter teeth. Thus, dental bleaching therapies have become more famous. Teenagers and adolescents get influenced by their peer's comments regarding their facial esthetics. Dental appearance plays an important role in determining their psychosocial well-being, affecting their perception of the maintenance of esthetics. The present cross-sectional research carried out among the high school boys of Riyadh using an online survey. An online questionnaire was constructed consisting of questions related to demographic data followed by questions including knowledge and perception towards teeth discoloration, bleaching/whitening, factors associated with the decision, etc. Regarding questions related to bleaching, only 22.8% did not know what it is, 78.2% said they would consult the dentist before using it, 39.6% reported the color achieved after bleaching would last forever. As far as their previous dental visits were concerned, 7.9% never visited a dentist, 43.4% had visited within 6 months, 25.7% within 6-12 months, and 23% more than 12 months. Students' level of knowledge regarding discoloration is unsatisfactory but satisfactory regarding bleaching.

Keywords: Discoloration, Bleaching, Knowledge, School boys

Introduction

Severe discoloration of teeth can be a key esthetic challenge [1, 2]. This discoloration may create psychological and social problems, if left untreated. The most primitive attempts to bleach teeth go back more than a century and concentrated on searching for a useful bleaching agent to paint on discolored teeth. Abbot had pioneered by 1918 the forerunner of the combination applied to bleach vital teeth today: an accelerated reaction caused by devices delivering heat to the teeth and hydrogen peroxide [3, 4].

In the current society, esthetic concepts are enhancing that result in an increasing request for esthetic procedures, especially among youngsters. Patients are keen to present a well-aligned smile and demand whiter teeth; thus, dental bleaching therapies have become more famous. Various dental bleaching procedures are offered for clinicians and patients, including over-the-counter products, at-home products used under the dentist's direction, and in-office products, with most comprising of various concentrations of carbamide peroxide or hydrogen [5].

A previous study among Saudi adults revealed that most of them were not happy with the color of their teeth, and their most preferred aesthetic treatment is bleaching. Patients' understanding of tooth discoloration is more focused on extrinsic etiology, and their knowledge about tooth bleaching appeared to be insufficient in many aspects. Social media could be an appropriate channel for specific educational programs designed by dental professionals to improve the general population's perception of tooth discoloration and bleaching [6].

Another similar study in Malaysia revealed that out of the 75.5% of respondents who were aware of bleaching, 18.2% had attempted to bleach their teeth utilizing either over-the-counter products or had undertaken professional bleaching therapy. 73.3% of these patients were satisfied with the results achieved after bleaching. Though, the bulk of these patients (59.6%) were uncertain of the safety of these bleaching products [7].

Teenagers and adolescents get influenced by their peer's comments regarding their facial esthetics. Dental appearance plays an important role in determining their psychosocial well-being, affecting their perception of the maintenance of

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esthetics. Previous studies have reported acceptable results of bleaching in teenagers and youngsters, which are the focus group of this study. However, the most common drawback was reported to be sensitivity. Gonçalves *et al*. (2017) revealed that adding calcium caused a decrease in tooth sensitivity, particularly when the lower concentration of hydrogen peroxide (20%) was employed. Substantial differences in color were observed after each of the two bleaching sessions [8]. In-office tooth bleaching was a useful method for young adults and adolescents [9].

Aims of the Study

- To determine the perception and knowledge levels of Saudi high school boys towards teeth discoloration and bleaching
- To compare the responses based on the type of school

Materials and Methods

Study Design: The present cross-sectional study was conducted among the high school boys of Riyadh using an online survey.

Study Sample: 504 high school boys participated in this study and were contacted using social media.

Study Instrument: The online questionnaire consisted of questions related to demographic data followed by questions including knowledge and perception towards teeth discoloration, bleaching/whitening, factors associated with the decision, etc.

Instrument Reliability and Validity: A pilot study was carried out by sending the survey to 20 participants. The data will be inserted in SPSS version 22 to determine the reliability using Chronbach's coefficient alpha (value: 0.783). The validity of the questionnaire was investigated by sending it to experienced researchers in REU but no changes were made.

Statistical Analysis: The collected data were analyzed using SPSS version 22, where descriptive and inferential statistics were performed. Comparisons between groups will be made with the value of significance kept under 0.05 using the Chi-square test.

Results and Discussion

Totally 504 high school boys participated in the present research with a mean age of 16.37 and 64.2% belonging to private whereas 35.8% to public schools. Regarding their grade, 18.8% were from grade 9, 29.3% from grade 10, 30.7% from grade 11 and 21.2% from grade 12. As far as their previous dental visits were concerned, 7.9% never visited a dentist, 43.4% had visited within 6 months, 25.7% within 6-12 months, and 23% more than 12 months **(Table 1)**.

Table 2 shows the overall responses to the survey questions, which reveal that 35.2% responded yes when inquired about discoloration caused by drugs, 33.3% related it with illness, 76.6% associated it with smoking, 40.8% did not know anything about fluoride, and 47.9% related discoloration with bacteria. Regarding the questions related to bleaching, 22.8% did not know what it was, 78.2% said they would consult the dentist before using it, 39.6% reported the color achieved after bleaching would last forever, 75.4% believed excessive bleaching would harm the teeth, and 46.6% chose sensitivity as the most common side effect of bleaching.

Table 3 indicates the comparison of survey questions and their responses based on school type with Chi-square test being done. Statistically significant associations were achieved when inquired about discoloration related with aging (p-value: .001), trauma (p-value: .023), hereditary causes (p-value: .009), endodontic materials (p-value: .001), knowledge about bleaching (p-value: .001), source of information (p-value: .006), consulting dentist before bleaching (p-value: .000), avoidance of smoking and tea after bleaching (p-value: .017), effectiveness of remedies (p-value: .008), relying on advertisements (p-value: .004) and side effects of bleaching (p-value: .020). Rest of the questions did not show any statistically significant association (p-value >0.05).

Table 1. Demographics of the Study Participants

Demographical Variables	Descriptives
Age	Mean age 16.37 (SD: 1.81)
High school grade	Grade 9: 18.8% Grade 10: 29.3% Grade 11: 30.7% Grade 12: 21.2%
School type	Private: 64.2% Public: 35.8%
Previous dental visit	Never: 7.9% Within 6 months: 43.4% 6 to 12 months: 25.7% 12+ months: 23%

Table 2. Survey Questions and their Responses in Percentage

Survey Questions	Responses (%)
Which of the following could cause tooth discoloration?	
Drugs during childhood	Yes: 35.2% No: 26.2% Don't know: 38.2%
Illness during childhood	Yes: 33.3% No: 31.1% Don't know: 35.6%
Aging	Yes: 52.3% No: 20.8% Don't know: 26.9%

Smoking	Yes: 76.6% No: 10.7% Don't know: 12.7%
Tea and coffee	Yes: 74.5% No: 9.7% Don't know: 15.8%
Trauma to the tooth	Yes: 36.4% No: 30.5% Don't know: 33.1%
Excessive fluoride in drinking water	Yes: 30.7% No: 28.5% Don't know: 40.8%
Hereditary causes	Yes: 31.9% No: 25.9% Don't know: 42.2%
Some antimicrobial mouthwashes	Yes: 33.3% No: 29.1% Don't know: 37.6%
Bacteria playing a role in tooth discoloration	Yes: 47.9% No: 16.8% Don't know: 35.2%
Endodontic materials	Yes: 28.9% No: 28.1% Don't know: 43%
Questions about Bleaching:	
Do you know what bleaching/whitening is?	Yes: 77.2% No: 22.8%
If yes, what was the source of information?	Family & friends: 37.8% Media: 22.1% Internet: 15.1% Advertisements: 14.4% Dentist: 10.7%
Do you think bleaching is safe?	Safe: 28.3% Not safe: 12.9% Not sure: 58.8%
Have you ever consulted a dentist to gain information about bleaching?	Yes: 49.3% No: 50.7%
I should consult a dentist before starting any type of home bleaching.	Yes: 78.2% No: 21.8%
Bleaching can whiten both the teeth and old restorations.	Yes: 48.9% No: 51.1%
Smoking and drinking tea and coffee should be avoided after bleaching.	Yes: 75.8% No: 24.2%
Bleaching will remove a thin layer from the tooth structure.	Yes: 59.8% No: 40.2%
The color achieved after bleaching will last forever.	Yes: 39.6% No: 60.4%
In case of relapse, the color of the teeth will be darker than the original.	Yes: 46.1% No: 53.9%
Bleaching agents should not come in contact with the gingiva	Yes: 70.9% No: 29.1%
All types of tooth discoloration could be treated by tooth bleaching	Yes: 53.5% No: 46.5%
Excessive use of bleaching products could be harmful.	Yes: 75.4% No: 24.6%
Some remedies can be effective for tooth bleaching	Yes: 59.4% No: 40.6%
Dental bleaching can improve the smell of the oral cavity	Yes: 37.4% No: 62.6%
I should not rely on the information mentioned in advertisements on tooth bleaching	Yes: 72.5% No: 27.5%
Side effect of bleaching?	Sensitivity: 46.5% Gingival irritation: 16.6% Effect on the teeth structure: 17.2% Effect on restorative materials: 8.5% No side effects: 11.1%

Table 3. Comparison of Responses based on School Type

Survey Questions	Private	Public	P-value
Which of the following could cause tooth discoloration?	No statistically significant association		.063
Drugs during childhood			
Illness during childhood	No statistically significant association		.053
Aging	Yes: 53% No: 16% Don't know: 31%	Yes: 51% No: 29% Don't know: 20%	.001
Smoking	No statistically significant association		.542
Tea and coffee	No statistically significant association		.764
Trauma to the tooth	Yes: 35% No: 28% Don't know: 37%	Yes: 40% No: 35% Don't know: 25%	.023
Excessive fluoride in drinking water	No statistically significant association		.187
Hereditary causes	Yes: 33% No: 22% Don't know: 46%	Yes: 30% No: 34% Don't know: 36%	.009
Some antimicrobial mouthwashes	No statistically significant association		.050
Bacteria playing a role in tooth discoloration	No statistically significant association		.096
Endodontic materials	Yes: 28% No: 23% Don't know: 48%	Yes: 30% No: 36% Don't know: 33%	.001

Questions about Bleaching:			
Do you know what bleaching/whitening is?	Yes: 80% No: 20%	Yes: 72% No: 28%	.021
If yes, what was the source of information?	Family & friends: 43% Media: 18% Internet: 15% Advertisements: 13% Dentist: 11%	Family & friends: 27% Media: 29% Internet: 16% Advertisements: 18% Dentist: 10%	.006
Do you think bleaching is safe?	No statistically significant association		.313
Have you ever consulted a dentist to gain information about bleaching?	No statistically significant association		.458
I should consult a dentist before starting any type of home bleaching.	Yes: 84% No: 16%	Yes: 69% No: 31%	.000
Bleaching can whiten both the teeth and old restorations.	No statistically significant association		.165
Smoking and drinking tea and coffee should be avoided after bleaching.	Yes: 79% No: 21%	Yes: 70% No: 30%	.017
Bleaching will remove a thin layer from the tooth structure.	No statistically significant association		.072
The color achieved after bleaching will last forever.	No statistically significant association		.636
In case of relapse, the color of the teeth will be darker than the original.	No statistically significant association		.577
Bleaching agents should not come in contact with the gingiva	No statistically significant association		.760
All types of tooth discoloration could be treated by tooth bleaching	No statistically significant association		.926
Excessive use of bleaching products could be harmful.	No statistically significant association		.068
Some remedies can be effective for tooth bleaching	Yes: 64% No: 36%	Yes: 51% No: 49%	.008
Dental bleaching can improve the smell of the oral cavity	Yes: 44% No: 56%	Yes: 26% No: 74%	.000
I should not rely on the information mentioned in advertisements on tooth bleaching	Yes: 77% No: 23%	Yes: 65% No: 35%	.004
Side effect of bleaching?	Sensitivity: 52% Gingival irritation: 14% Effect on the teeth structure: 15% Effect on restorative materials: 8% No side effects: 11%	Sensitivity: 37% Gingival irritation: 21% Effect on the teeth structure: 21% Effect on restorative materials: 10% No side effects: 11%	.020

This study aimed to assess the levels of knowledge and exposure of high school boys residing in Riyadh regarding teeth whitening or bleaching. Students from four high school grades were utilized in this study and were grouped based on private and public schools. It was noted from the findings that more than one-third of the participants were unaware that drugs and illness during childhood could lead to teeth discoloration. However, a large majority of them were aware that smoking and drinking tea or coffee are related to discoloration. Similar findings were observed among a young population utilized in a study carried out by Al-Nomay *et al*. (2015) [10].

When inquired about trauma, fluoride, hereditary causes, and mouthwashes, the study participants were generally unaware of their association with teeth discoloration. A study conducted among similar children in Lithuania reported that the overall knowledge about trauma and teeth discoloration is on the lower side [11]. These findings are similar to what we reported regarding trauma and discoloration.

Regarding the relation of fluoride and teeth discoloration, a study conducted in Karnataka, Indian, among the high school students reported that most of the participants could identify fluoride-related teeth discoloration. Moreover, their viewpoint was also assessed based on the type of school, private or public, where a significant difference between the two groups was observed. Private school children acknowledged the relationship of fluoride-related discoloration more than public school children [12]. When comparing these findings with our study, it was observed that there was no statistically significant difference between the type of schools when inquired about the association of fluoride with teeth discoloration.

A large majority of students knew about bleaching, and their source of information was mainly family and friends. A study conducted among school children in Buraida, Qassim, reported similar findings. The majority of the students were aware of what bleaching was and supported its use in treating teeth discoloration [13]. One of the limitations of a survey-based study is that a few respondents may not feel encouraged to provide accurate and honest answers, affecting the findings.

Conclusion

- Knowledge of high school students regarding teeth discoloration causes is unsatisfactory.
- The perception of students towards bleaching is positive.
- Knowledge levels related to bleaching are satisfactory.
- Students need to be educated regarding the different causes of teeth discoloration.

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