



# The Open Dentistry Journal

Content list available at: <https://opendentistryjournal.com>



## RESEARCH ARTICLE

### A Cross-Sectional Online Survey on Knowledge, Awareness, and Perceptions of Hollywood Smile Among the Saudi Arabia Population

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#### Abstract:

#### Background:

Hollywood smile has gained popularity in recent times to improve aesthetics among the general population. Since patients' perceptions of dental aesthetics play a vital role in planning and evaluating cosmetic dental treatment, it is essential to understand their knowledge, awareness, and factors that influence their perceptions of dental aesthetics.

#### Objectives:

The objective of this study was to assess the knowledge, awareness, and perceptions of Hollywood smile among the general population in Saudi Arabia.

#### Methods:

A close-ended questionnaire consisting of demographic information and 20 questions related to Hollywood smile was circulated through social media in Saudi Arabia. Statistical analyses of the data obtained were performed using Statistical Package for Social Sciences software (SPSS version 17, USA). Frequencies, percentages, and mean and standard deviation were calculated using descriptive statistics. Pearson chi-squared test was employed to test the association between the demographic variables, such as age, gender, and education levels, with the questionnaire items.

#### Results:

A total of 4104 participants responded to the study questionnaire. The responses to the questionnaire revealed that nearly half of the participants were not satisfied with their dental appearance (48.6%). The majority of the participants had heard or known about Hollywood smile (98%). About 42% of study participants were aware of the complications involved in the procedure. The results revealed that the younger generation (18 to 30 years) had more awareness and felt more need for dental aesthetics ( $p=0.001$ ). The proportion of male participants who underwent Hollywood smile correction were more than females ( $p=0.001$ ). Graduates showed more awareness regarding smile, dental aesthetics, and Hollywood smile than the other categories ( $p=0.001$ ).

#### Conclusion:

This study has shown that the younger generation, female participants, and graduates had more awareness regarding smile, dental aesthetics, and Hollywood smile.

**Keywords:** Hollywood smile, Dental aesthetics, Survey, Perception, Questionnaire, Dentistry.

#### Article History

Received: November 16, 2021

Revised: October 13, 2021

Accepted: October 26, 2021

## 1. INTRODUCTION

Dental treatment needs for the current generation of patients are not just limited to pain control and regaining function, such as eating, chewing, speaking, and swallowing,

but they are equally concerned about aesthetics [1 - 4]. This has led to a rapid revolution in cosmetic dentistry, which essentially deals with dental aesthetics gaining popularity among young dentists and patients [5, 6]. The rise in demand for aesthetic dental treatments among the general population is mainly because of social media, motivation from movie actors, actresses, and even politicians [7 - 9]. In recent times, the

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practice of dentistry has revolved around giving the public what they want, *i.e.*, good-looking and attractive smiles [10, 11]. Cosmetic dental treatments, such as teeth whitening, orthodontic treatment, veneers, and midline diastema closure, are in more demand [12, 13].

The term Hollywood smiles gained popularity which refers to the aesthetic development of dental appearance inspired by the beauty displayed by the movie actors [14, 15]. Technically, Hollywood smiles represent broad smiles with no buccal corridors [16]. The buccal corridor spaces are the negative space created between the buccal surfaces of the posterior teeth and the inner wall of the cheek [17, 18]. The symmetrical and aesthetically pleasing smiles have been associated with wealth and social acceptance. Several people believe having a Hollywood smile can boost self-esteem and give a better first impression [10, 19].

Aesthetics is a subjective construct, and hence the definition of dental aesthetics differs among dentists, common population, gender, socio-economic status, geographical area, and culture [7, 14, 15, 20 - 22]. Since patients' perception of dental aesthetics plays a vital role in cosmetic dental treatment planning and evaluation, it is important to understand their knowledge, awareness, and factors that influence their perception of dental aesthetics [23 - 25]. This study aimed to assess the knowledge, awareness, and perceptions of Hollywood smile among the general population in Saudi Arabia.

## 2. MATERIALS AND METHODS

This cross-sectional survey was carried out among 4104 participants from the general population in Saudi Arabia. The study was reviewed and approved by the Research Ethics Committee in accordance with the World Medical Association Declaration of Helsinki guidelines regarding the ethical conduct of research involving human subjects. An informed consent form was administered electronically along with the study questionnaire, and participants were requested to fill the questionnaire only after taking informed consent. Only participants from Saudi Arabia above 18 years of both genders were included in the study. The participants below 18 years were excluded from the study. The study was confined to Saudi Arabia. The sample for the study was selected by convenient sampling through social media in Saudi Arabia, and a self-administered questionnaire was administered to all the participants through social media. After forwarding the questionnaire for the first time to participants, they were followed up three times a month, requesting them to fill the questionnaire.

The questionnaire consists of demographic information and 20 items related to Hollywood smile. Demographic information, such as age, gender, and education levels, was collected. Among the 20 questions, the initial five questions assessed their awareness about smile, dental aesthetics, and Hollywood smile. Questions 6 to 11 were related to problems/complications related to the Hollywood smile, while questions 11, 12, 16, and 17 were related to alternate less invasive dental aesthetic procedures. The remaining questions were related to participant's experience of the Hollywood smile

procedure. The questionnaire was initially prepared in English and later was translated into the local Arabic language.

### 2.1. Statistical Analysis

The statistics were performed using Statistical Package for Social Sciences software (SPSS version 17.0, Chicago, Illinois, USA). Frequencies, percentages, mean, and standard deviation were calculated. Pearson chi-square test was employed to test the association between the demographic variables, such as age, gender, and level of education, with the questionnaire items. The p-value was considered less than 0.05 to define statistical significance.

## 3. RESULTS

A total of 4104 participants participated in this study. Among them, 65% were female participants. The majority of them were Saudi residents (94%), and most of them were either high school completed (40.4%) or had completed graduation (51.7%). About 78% of participants were aged between 18 to 30 years (Table 1).

**Table 1. Characteristics of study participants.**

		N	%
<b>Gender</b>	Male	1438	35.0
	Female	2666	65.0
<b>Nationality</b>	Saudi	3859	94.0
	Non Saudi	245	6.0
<b>Education level</b>	Middle School	136	3.3
	High school	1659	40.4
	Graduate	2120	51.7
	Post Graduate	189	4.6
<b>Age Category</b>	18-30	3202	78.0
	31-40	442	10.8
	41-50	304	7.4
	more than 50	156	3.8

Responses to the questionnaire revealed that nearly half of the participants were not satisfied with their dental appearance (48.6%). About 68.2% of participants agreed that their smile affects their social life. The majority of the participants had heard or known about Hollywood smile (98%) and also knew that it is expensive to get the Hollywood smile correction procedure (81%). About 40% to 50% of the study participants were aware of the complications/failures associated with Hollywood smile procedures, such as removing healthy tooth structure, pain and sensitivity, gingival and periodontal problems, fracture of the prosthesis, and replacement of prosthesis in the future. More than 85% of participants preferred less invasive procedures, such as orthodontic correction and bleaching, over Hollywood smile correction. Only 3.7% of participants had undergone Hollywood smile correction, and among them, 69.5% of those who underwent the procedure were satisfied with the aesthetic outcome. About 39% of participants who had undergone Hollywood smile correction received a suggestion from their dentist about alternate less invasive procedures, yet they did not opt-in. Nearly 52% of participants experienced problems/complications after the Hollywood smile procedure (Table 2).

Pearson chi-square test was employed to test the association between questionnaire items with study variables of age category, gender, and education levels. All the questionnaire

items showed a statistically significant association (p=0.001) with age categories except question numbers 9 and 12. The results revealed that the younger generation (18 to 30 years) has more awareness and dental aesthetics needs (Table 3).

**Table 2. Responses of participants to the study questionnaire.**

		No		Yes		Don't know	
		N	%	N	%	N	%
-	-						
Q1	Are you satisfied with your current dental appearance?	1996	48.6	2108	51.4		
Q2	Do you think your smile affects your social life?	1306	31.8	2798	68.2		
Q3	Have you heard about Hollywood smile?	81	2.0	4023	98.0		
Q4	If yes, what is your source of information? you can choose more than one i. Advertisement: 600 (14.6 %) ii. Dentist: 160(3.9%) iii. Newspaper: 212(5.2%) iv. People-Word of mouth: 738(18.0%) v. Social media: 2316(56.4%) vi. Other sources: 71(1.7%) vii. All of above: 7(0.2%)						
Q5	Do you feel the procedure is expensive?	198	4.8	3323	81.0	583	14.2
Q6	Are you aware of the complications/failures associated with the procedure?	2367	57.7	1737	42.3		
Q7	Are you aware that healthy tooth structure will be removed for the procedure?	1794	43.7	2310	56.3		
Q8	Are you aware that pain and sensitivity may result due to the procedure?	1823	44.4	2281	55.6		
Q9	Are you aware that gingival inflammation and periodontal problems may result due to the procedure?	2204	53.7	1900	46.3		
Q10	Are you aware that the prosthesis can fracture or debond?	1920	46.8	2184	53.2		
Q11	Are you aware that the procedure will require replacement in future?	2320	56.5	1784	43.5		
Q12	Would you prefer less invasive dental esthetic procedure (such as bleaching, composites) over veneers/Hollywood smile?	475	11.6	3629	88.4		
Q13	Would you prefer less invasive dental esthetic procedure(Orthodontics) over veneers/Hollywood smile?	571	13.9	3533	86.1		
Q14	Have you undergone Hollywood smile?	3953	96.3	151	3.7		
Q15	Are you satisfied with the esthetic outcome?	46	30.5	105	69.5		
Q16	Did the dentist elaborate on less invasive alternative procedures?	92	61	59	39		
Q17	Did you undergo the procedure despite your dentist not recommending it?	89	60	62	40		
Q18	Are you financially burdened for undergoing this procedure?	44	29	107	71		
Q19	Are you having any issues due to this procedure?	72	47.6	79	52.4		
Q20	If yes, which among the following problems do you have due to the procedure? you can choose more than one i. Bad smell: 18 (12%) ii. Bleeding gums, Bad smell, Gum swelling: 24 (16%) iii. Difficulty in chewing food: 7 (4.6%) iv. Aesthetics: 4 (2.6%) v. Low intensity pain which aggravates if flossing is not done: 1 (0.7%) vi. Pain: 26 (17.2%) vii. Sensitive teeth: 23 (15.2%) viii. Some veneers got dislodged: 2 (1.3%)						

**Table 3. Association between each item of questionnaire with age category.**

		Age Category (Years)				p-value
		18-30	31-40	41-50	> 50	
Are you satisfied with your current dental appearance?	Yes	76.9%	10.1%	8.3%	4.8%	0.001*
Do you think your smile affects your social life?	Yes	79.9%	10.9%	6.7%	2.6%	0.001*
Have you heard about hollywood smile?	Yes	78.4%	10.5%	7.4%	3.7%	0.001*
Do you feel the procedure is expensive?	Yes	78.1%	10.9%	7.6%	3.3%	0.001*
Are you aware of the complications/failures associated with the procedure?	Yes	79.0%	10.6%	7.0%	3.5%	0.007*
Are you aware that healthy tooth structure will be removed for the procedure?	Yes	77.6%	11.9%	7.1%	3.4%	0.533
Are you aware that pain and sensitivity may result due to the procedure?	Yes	79.6%	10.6%	6.5%	3.4%	0.034*
Are you aware that gingival inflammation and periodontal problems may result due to the procedure?	Yes	79.2%	10.6%	6.8%	3.3%	0.018*

(Table 3) contd....

Are you aware that the prosthesis can fracture or debond?	Yes	80.2%	10.6%	6.0%	3.2%	0.219
Are you aware that the procedure will require replacement in future?	Yes	79.9%	11.1%	5.9%	3.1%	0.001*
Would you prefer less invasive dental esthetic procedure (such as bleaching, composites) over veneers/Hollywood smile?	Yes	78.3%	10.6%	7.5%	3.6%	0.002*
Would you prefer less invasive dental esthetic procedure(Orthodontics) over veneers/Hollywood smile?	Yes	79.7%	9.7%	7.0%	3.5%	0.290
Have you undergone Hollywood smile?	Yes	59.6%	21.9%	11.9%	6.6%	0.001*
Are you satisfied with the esthetic outcome?	Yes	61.0%	20.0%	12.4%	6.7%	0.001*
Did the dentist elaborate on less invasive alternative procedures?	Yes	71.2%	15.3%	10.2%	3.4%	0.001*
Did you undergo the procedure despite your dentist not recommending it?	Yes	64.5%	22.6%	11.3%	1.6%	0.001*
Are you financially burdened for undergoing this procedure?	Yes	56.1%	22.4%	15.0%	6.5%	0.001*
Are you having any issues due to this procedure?	Yes	63.3%	20.3%	10.1%	6.3%	0.001*

Pearson Chi-square test, \*Statistical significance at 5%

The association between the questionnaire items and gender revealed a significant association (p=0.001). Awareness about smile, dental aesthetics, and Hollywood smile was more among females than male counterparts. However, the proportion of male participants who underwent Hollywood smile correction were more than females (Table 4). The

association between questionnaire items and education levels was checked, and a significant association (p=0.001) was revealed between the level of education and all items of the questionnaire except questions number 2 and 3. Graduates had more awareness about smile, dental aesthetics, and Hollywood smile than the other categories (Table 5).

**Table 4. Association between each item of questionnaire with gender category.**

		Gender			p-value
		Male	Female		
Are you satisfied with your current dental appearance?	Yes	32.9%	67.1%	0.003*	
Do you think your smile affects your social life?	Yes	33.7%	66.3%	0.009*	
Have you heard about hollywood smile?	Yes	34.8%	65.2%	0.012*	
Do you feel the procedure is expensive?	Yes	34.3%	65.7%	0.001*	
Are you aware of the complications/failures associated with the procedure?	Yes	27.5%	72.5%	0.001*	
Are you aware that healthy tooth structure will be removed for the procedure?	Yes	32.0%	68.0%	0.001*	
Are you aware that pain and sensitivity may result due to the procedure?	Yes	25.7%	74.3%	0.001*	
Are you aware that gingival inflammation and periodontal problems may result due to the procedure?	Yes	25.8%	74.2%	0.001*	
Are you aware that the prosthesis can fracture or debond?	Yes	32.7%	67.3%	0.001*	
Are you aware that the procedure will require replacement in future?	Yes	32.5%	67.5%	0.001*	
Would you prefer less invasive dental esthetic procedure (such as bleaching, composites) over veneers/Hollywood smile?	Yes	33.5%	66.5%	0.002*	
Would you prefer less invasive dental esthetic procedure(Orthodontics) over veneers/Hollywood smile ?	Yes	32.4%	67.6%	0.001*	
Have you undergone Hollywood smile?	Yes	62.3%	37.7%	0.001*	
Are you satisfied with the esthetic outcome?	Yes	61.9%	38.1%	0.001*	
Did the dentist elaborate on less invasive alternative procedures?	Yes	62.7%	37.3%	0.001*	
Did you undergo the procedure despite your dentist not recommending it?	Yes	59.7%	40.3%	0.001*	
Are you financially burdened for undergoing this procedure?	Yes	56.1%	43.9%	0.001*	
Are you having any issues due to this procedure?	Yes	59.5%	40.5%	0.001*	

Pearson Chi-square test, \*Statistical significance at 5%

**Table 5. Association between each item of questionnaire with education level.**

		Level of education				p-value
		Middle School	High School	Graduate	Post- graduate	
Are you satisfied with your current dental appearance?	Yes	2.6%	38.0%	53.7%	5.6%	0.001*
Do you think your smile affects your social life?	Yes	3.1%	39.4%	52.8%	4.7%	0.145
Have you heard about hollywood smile?	Yes	3.3%	40.5%	51.7%	4.6%	0.750
Do you feel the procedure is expensive?	Yes	3.3%	39.9%	52.3%	4.5%	0.001*
Are you aware of the complications/failures associated with the procedure?	Yes	3.2%	37.0%	54.7%	5.1%	0.001*
Are you aware that healthy tooth structure will be removed for the procedure?	Yes	2.5%	35.7%	56.5%	5.3%	0.001*
Are you aware that pain and sensitivity may result due to the procedure?	Yes	3.1%	39.3%	52.6%	5.1%	0.001*

(Table 5) contd.....

Are you aware that gingival inflammation and periodontal problems may result due to the procedure?	Yes	2.8%	37.6%	54.4%	5.3%	0.113
Are you aware that the prosthesis can fracture or debond?	Yes	2.4%	38.3%	53.9%	5.4%	0.001*
Are you aware that the procedure will require replacement in future?	Yes	2.7%	36.2%	55.8%	5.3%	0.001*
Would you prefer less invasive dental esthetic procedure (such as bleaching, composites) over veneers/Hollywood smile?	Yes	3.3%	40.0%	52.5%	4.2%	0.001*
Would you prefer less invasive dental esthetic procedure (Orthodontics) over veneers/ Hollywood smile?	Yes	3.3%	41.4%	51.1%	4.2%	0.001*
Have you undergone Hollywood smile?	Yes	2.0%	27.8%	57.6%	12.6%	0.002*
Are you satisfied with the esthetic outcome?	Yes	2.9%	29.5%	53.3%	14.3%	0.001*
Did the dentist elaborate on less invasive alternative procedures?	Yes	1.7%	25.4%	62.7%	10.2%	0.001*
Did you undergo the procedure despite your dentist not recommending it?	Yes	1.6%	24.2%	62.9%	11.3%	0.001*
Are you financially burdened for undergoing this procedure?	Yes	0.9%	29.0%	53.3%	16.8%	0.001*
Are you having any issues due to this procedure?	Yes	0.0%	29.1%	60.8%	10.1%	0.001*

Pearson Chi-square test, \*Statistical significance at 5%

#### 4. DISCUSSION

In general, the perceptions are that the people with an attractive smile will have the high privilege of having better jobs, having more successful marriages, and experiencing happier, more fulfilling lives [26 - 30]. On the contrary, the people with unattractive dental aesthetics have less self-confidence and are thought to be socially, academically, and occupationally disadvantageous [31 - 33]. Parrini *et al.* [34] and Del Monte *et al.* [35] performed systematic reviews on lay people’s perceptions of aesthetics. The authors suggested that laypeople can identify various factors affecting smile aesthetics, and a collective estimate of their threshold values for different features of smile and dental aesthetics has been described. These estimated tolerable and ideal threshold values could guide clinicians towards treating patients with dental aesthetic needs. Del Monte *et al.* [35] have mentioned around 20 different dentogingival parameters that define smile esthetics. Parrini *et al.* [34] highlighted the importance of layman’s perception of smile aesthetics to better understand treatment goals from the patient’s point of view. Our present study was designed to assess the knowledge, awareness, and perceptions of Hollywood smile among the general population in Saudi Arabia. We also assessed the association of the questionnaire response with age, gender, and level of education.

In this study, the majority of the participants were females (65%). As it was an electronic survey, participation mainly depended on social media usage. The past literature also supported our findings as it has been observed that females utilize social media more than males owing to their emotional behavior [36 - 38]. Most of the items of the questionnaire showed a statistically significant association with age categories [39]. This study also revealed that younger generation participants within the age group of 18 years to 30 years had more awareness regarding smile, dental aesthetics, and Hollywood smile. These findings are in agreement with previously reported studies by Aldajj *et al.* [34] and Ansari *et al.* [14]. Both of these studies were carried out on the Saudi population. These studies have found that the younger generation is more inclined towards Hollywood smile. Generally, the young age population gives more importance to their appearance, including dental aesthetics [40 - 43].

Another well-observed fact from the present study is that females are more concerned about their overall appearances and aesthetics. Research has also proven that females give more importance to dental aesthetics and attractive smile [1, 32, 44, 45]. Studies have also revealed that females are more attentive to dental health issues, resulting in more regular appointments and better compliance [46]. The present study also revealed that the female gender has significantly higher awareness regarding smile, dental aesthetics, and Hollywood smile.

We have also examined the influence of education levels on awareness regarding smile, dental aesthetics, and Hollywood smile. We also observed that the awareness increased as the level of education increased till the graduation level, but then the postgraduates had lesser inclination and awareness regarding dental aesthetics and smile. This shows a non-linear relationship between education and awareness regarding smile, dental aesthetics, and Hollywood smile. There are very few studies in the literature that considered the education levels to assess the awareness regarding smile, dental aesthetics, and Hollywood smile [47 - 49]. Our findings are in agreement with the study conducted by Flores-Mir *et al.* that reported that education levels had no consistent impact on dental aesthetic perceptions [50].

Our study is conducted on a large sample, due to which the data are reliable. This is perhaps the first study conducted among the general Saudi population assessing the awareness regarding Hollywood smile. There are a few limitations of this study that need to be taken into consideration before generalizing the results. This is an online survey, and hence most of the participants would be internet friends. Moreover, it excludes the participants who are not techy or internet-friendly [51, 52]. In any questionnaire study based on self-assessment, the participants will respond subjectively; hence, some of their responses may be biased. The sample is only confined to Saudi Arabia, and the sample size of the present study is also reasonably large. The present study cannot be generalized. However, it could be used as a reference for further studies planned on the Hollywood smile. One of the limitations in the present study was that the response rate was not sought as the study was done using social media and the authors have no control over the sampling.

## CONCLUSION

The study reveals important observations which are vital for treatment planning and evaluation. The present study shows that the younger generations, female participants, and graduates had more awareness regarding smile, dental aesthetics, and Hollywood smile.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Review Board of Majmaah University, Kingdom of Saudi Arabia, No. MUREC-Nov. 27/COM-2020/16-4.

## HUMAN AND ANIMAL RIGHTS

No animals were used in this study. The reported experiments on humans are in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013.

## CONSENT FOR PUBLICATION

Informed consent was obtained from all patients included in the study.

## STANDARD OF REPORTING

STROBE guidelines and methodologies were followed for this study.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the [zenodo] at [<https://doi.org/10.5281/zenodo.5797977>], reference number [5797977].

## FUNDING

None.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

## ACKNOWLEDGMENTS

The authors would like to thank the Deanship of Scientific Research, Majmaah University, Kingdom of Saudi Arabia. The authors would also like to thank all the participants involved in the study.

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