

# Saudi Self-Concept, Attitude and Factors Influencing their Satisfaction towards Dental Appearance: An Online Questionnaire Survey

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## Abstract

**Background:** Self-perception of the facial aesthetics has been reported as an imperative and worldwide element influencing proficiency and emotions, in addition to academic and physical aspects of self-concept. The aim of the current study was to determine the possible factors that influence self-perceived dental appearance satisfaction among Saudi patients, to determine the factors that may influence their choice of treatment to improve their dental appearance and to verify their most common esthetically favored treatment modality.

**Methods:** This cross-sectional survey used an online questionnaire that consisted of 30-items divided into three sections. Questions included general questions on socio-demographic information, self-perceived dental appearance satisfaction in the anterior region, and respondents preferred dental treatment to improve their aesthetics.

**Results:** The study included 1503 Saudi adults (majority were females (75%) and 87.8% were from urban areas with an age range of 18 and 60 years and a mean age of 33.5 ( $\pm$  10.8) years). Generally, 1003 (66.5%) of the participants were satisfied with the appearance of their teeth and smile. The most reported dental problems affecting their satisfaction were found to be unsatisfactory frontal tooth fillings (28.3%). The most preferred dental intervention was “teeth cleaning, gum treatment and polishing” (80.2%). When simple logistic regression model was used, eight factors were found to have significant adjusted effect including urban residence (OR=1.45; 95% CI: 1.0-2.14), teeth color (OR=0.26; 95% CI: 0.19-0.34), crowding (OR=0.41; 95% CI: 0.30-0.56), unsatisfactory frontal teeth filling (OR=0.62; 95% CI: 0.45-0.85), broken frontal teeth (OR=0.68; 95% CI: 0.49-0.93), red inflamed gum (OR=0.69; 95% CI: 0.50-0.95), covering teeth while smiling (OR=6.54; 95% CI: 4.85-8.80) and extent of gum display while smiling (OR=0.62; 95% CI: 0.44-0.88). A direct significant relation between self-perceived dental satisfaction and being informed by other individuals about their dental problems with a recorded statistical significance ( $P=0.044$ ).

**Conclusion:** Two third of the respondents were generally satisfied with their dental appearance. The most reported dental problem was found to be discolored unsatisfactory frontal tooth fillings. Saudi satisfaction was found to be affected by many factors including being informed by others that the appearance of their teeth is inappropriate.

**Keywords:** Patient satisfaction; Esthetics; Dental; Attitude; Awareness; Perception

## Introduction

Dental appearance is of paramount importance in defining the attractiveness of a face, and hence has a great influence in people's social relations [1]. It influences the perceptions of facial charm irrespective of individual's gender or related facial appearance and significantly affects people's physical fascination [2,3]. Self-perception of the facial aesthetics has been reported as an imperative and worldwide element influencing proficiency and emotions, in addition to academic and physical aspects of self-concept [3].

The significance of dental esthetics is related primarily to social relations and selections, profession aspiration and accomplishments of individuals [4,5]. It has been cited in the literature that people with fewer dental problems are deemed to have superior social skills, better intellectual success, and greater psychologic flexibility [6]. This is additionally supported

by the point that adults with noticeable dental diseases are more hesitant to pursue employment because of their compromised facial appearance or speech. Provision of social and psychological support for those affected by their dental appearance was suggested by Somani. et al., since a significant association was found between compromised dental status on the one hand, and perceived poor social intelligence and academic performance on the other hand [7,8].

Many factors were found to play an important role in determining the general dental appearance including such as tooth color,

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shape, position, type of restoration, and the arrangement in the dental arch, particularly of the front teeth [1]. Additionally, a visually attractive smile was found to rely on the color, size, and shape of the tooth, beside the position of the upper lip, visibility of teeth and extent of gum display [9].

Several scholars attempted to assess the degree of patients' satisfaction with respect to their dental appearance [10]. The studies showed that dental interventions such as orthodontic treatment and tooth whitening may increase the patients' satisfaction with their dental appearance, perception of attractiveness and the quality of their life [11-13].

Teeth bleaching, esthetic restorations of anterior teeth, labial veneers, and esthetic crowns, in addition to orthodontic intervention are repeatedly requested by patients who are concerned about refining their dental appearance [14].

Individual self-concept regarding the dental appearance is considered an important determining factor of dental treatment seeking behavior and is largely influenced by self-perception, culture, and environment [15-17]. Hence, the provision and maintenance of patient's satisfaction with respect to dental appearance are the basics of proper dental care [18].

The aim of the current study was to determine the possible factors that influence self-perceived dental appearance satisfaction among Saudi patients, to determine the factors that may influence their choice of treatment to improve their dental appearance and to verify their most common esthetically favored treatment modality.

## Materials and Methods

This cross-sectional online survey was conducted using google form questionnaire in the period between Janil and July 2020.

The study targeted adult Saudi individuals all over the Kingdom, who previously received any kind of dental treatment involving the esthetic region, with no clear evidence of cognitive disturbances.

The conduct of this research was ethically approved by the Institution Review Board (IRB) of King Khalid University, College of Dentistry. Informed consent was obtained from all the research participants and was included as a mandatory section in the google form. Participation in this study was completely voluntary and no incentive was offered.

The tool of data collection was an online, self-developed, validated self-administered questionnaire, which was completely anonymous without any possible identifiers. The questionnaire consisted of 30-item divided into three sections; the first section included general questions on socio-demographic information such as sex, age, level of education, work, and social status. Whereas the second section comprised questions on perceived dental appearance satisfaction, in addition to questions on their satisfaction with tooth color, shape, size, perceived malalignment (crowding, poorly aligned or protruding), inflammation in their gum, gummy smile, caries in anterior teeth, non-aesthetic anterior tooth colored restoration and presence of tooth fracture. The third section assessed patients' perceived dental treatment of choice to improve their appearance; it included many treatment options such as orthodontic treatment,

bleaching, cosmetic fillings, teeth polishing, replacement of old restorations by esthetic ones, surgical intervention or Botox injection to improve gum smile, and the use of dental implant to replace missing teeth. All questions were assessed with a yes or no response and no further query on quantity was attempted.

As the questionnaire was initially prepared in English, it was then translated into Arabic. The Arabic-translated version was then revised and approved by an expert who was fluent in both Arabic and English languages.

Then the finalized Arabic- version of the questionnaire was tested for validity by content validity testing by 2 experts. Its reliability was also checked by test and re-test on a random sample of 10 participants with two weeks interval. Feedback regarding problems understanding and answering the questionnaire was obtained and addressed promptly. Following these steps, the questionnaire was then converted into an online data collection tool using google forms.

## Data analysis

Following data collection, it was revised, coded and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. The data was subjected to descriptive statistics including mean and Standard Deviation (SD) for continuous variables and frequencies, percentages, and cross-tabulations for categorical variables. Pearson Chi-square statistics was used to compare the sex, age, education levels, work, and marital status of patients with their satisfaction response towards their dental appearance. Logistic regression was used as well where dental appearance satisfaction was set as the dependent variable while the demographic and tooth characteristics were the independent variables  $P < 0.05$  was significant.

## Results

### Participants' general information

A total of 1503 Saudi adults, all over the Kingdom, aged between 18 and 60 years with a mean age of 33.5 ( $\pm 10.8$ ) years responded to the online questionnaire in the period between Janil and July 2020. Majority of the respondents were females (75%) and 87.8% were from urban areas. As for education, 79.1% were university graduates and 43.5% were working, while 31.5% were students. Nearly half of the participants were married (49.4%) and 48.2% were single.

Exact of 501 (33.3%) respondents reported that they have been told that the appearance of their teeth is inappropriate, and the most reported problem was having discolored tooth (24.7%) followed by irregular tooth (20.1%), dental caries (15.6%), and spacing (15.4%) (Table 1).

**Table 1: Personal data of general population in the study, Saudi Arabia.**

Personal data	No	%	
Age in years	<20 years	122	8.10%
	20-34	743	49.40%
	35-44	319	21.20%
	45-54	239	15.90%
	55+	80	5.30%

Gender	Male	375	25.00%
	Female	1128	75.00%
Residence	Urban	1319	87.80%
	Rural	184	12.20%
Education	Basic	41	2.70%
	Secondary	273	18.20%
	University	1189	79.10%
Work	Not working	247	16.40%
	Student	474	31.50%
	retired	128	8.50%
	Working	654	43.50%
Marital status	Single	724	48.20%
	Married	742	49.40%
	Divorced/ widow	37	2.50%
Have you ever been told that the appearance of your teeth is inappropriate?	Yes	501	33.30%
	No	1002	66.70%
What was the negative comment on your teeth?	Broken	6	1.20%
	Carries	24	4.70%
	Cast	79	15.60%
	Coloured	45	8.90%
	Irregular	119	23.50%
	Protruded	102	20.10%
	Spacing	54	10.70%
		78	15.40%

### Dental abnormalities as reported by study participants

Table 2 demonstrates dental abnormalities as reported by study participants and their satisfaction regarding dental appearance. Exact of 657 (43.5%) of the participants reported that they are satisfied with the colour of their teeth. The most reported dental problems affecting their satisfaction were unsatisfactory frontal tooth fillings (28.3%) while protruded lower jaw was the least reported problem (6.2%).

**Table 2: Dental abnormalities as reported by study participants and their satisfaction regarding dental appearance.**

Dental anomalies and satisfaction	Yes		No	
	No	%	No	%
Are you satisfied with the colour of your teeth?	657	43.50%	852	56.50%
Have crowded teeth	345	22.90%	1164	77.10%
Protruded frontal upper teeth	372	24.70%	1137	75.30%
Protruded lower jaw	93	6.20%	1416	93.80%
Frontal tooth caries	334	22.10%	1175	77.90%
Unsatisfactory frontal tooth fillings	427	28.30%	1082	71.70%
Broken frontal tooth	318	21.10%	1191	78.90%
Uncover teeth during laughing	386	25.60%	1123	74.40%
Red inflamed gum	321	21.30%	1188	78.70%
The appearance of a large area of gum while laughing?	264	17.50%	1245	82.50%
Generally, satisfied about your teeth and laugh	1003	66.50%	506	33.50%

### Preferred dental interventions to improve tooth appearance

Preferred dental interventions to improve tooth appearance, as perceived by participants, are illustrated in table 3. The most preferred dental interventions were “teeth cleaning, gum treatment and polishing” (80.2%) followed by “cosmetic fillings” for teeth with caries (78.6%), whereas, respondents reported that “Botox injections to reduce the visible area of the gums” was the least needed intervention to improve their dental aesthetics constituting 25.5% (Table 3).

**Table 3: Preferred dental interventions to improve tooth appearance as reported by study participants.**

Interventions needed to improve tooth appearance	No.	%
Teeth cleaning, gum treatment and polishing	1202	80.20%
Make cosmetic fillings for teeth with caries	1178	78.60%
Teeth whitening	1094	73.00%
Replace old fillings with new cosmetic fillings	1036	69.20%
Orthodontic intervention	1024	68.10%
Root canal treatment (nerve removal)	824	55.00%
Tooth covering	729	48.70%
Dental implants	645	43.40%
Surgical intervention to reduce the visible area of the gums while laughing or smiling	458	30.60%
Make a partial or full unit (bridge)	408	27.20%
Dental Veneers	398	26.60%
Botox injections to reduce the visible area of the gums while smiling	382	25.50%

### Participants' satisfaction with their dental appearance

Generally, 1003 (66.5%) of the participants were satisfied with the appearance of their teeth and smile.

**Association between participants' general satisfaction and their personal data:** Pearson chi square test was used to test the association between participants' general satisfaction and their personal data including dental problems (Table 4). It was found that 68.5% of those who were never informed by others about their dental problems were satisfied compared to 63.3% of those who did, with a recorded statistical significance (P=0.044). Furthermore, 85.2% of those who were satisfied with their tooth color reflected a general satisfaction compared to 52% of those who were unsatisfied with their tooth color (P=0.001). Satisfaction was recorded among 72.9% of those did not suffer from crowding of teeth (P=0.001), 70% of those who do not suffer from protrusion of upper front teeth (P=0.001), 67.5% of those without protrusion of lower teeth, 71.2% of those who had no caries in the frontal tooth (P=0.001), and 71.9% of those who had satisfactory frontal tooth filling (P=0.001). Exact of 79.5% of those who uncover their tooth during smile were generally satisfied (P=0.001) and 70.8% of those who have normal shaped gum appearance reported general satisfaction level regarding their teeth (P=0.001).

**Table 4: Participants' general satisfaction as related to their personal data and dental problems.**

Factors	Generally, satisfied about your teeth				P-value	
	Yes		No			
	No.	%	No.	%		
Age in years	<20 years	84	68.90%	38	31.10%	0.536
	20-34	499	67.20%	244	32.80%	
	35-44	206	64.60%	113	35.40%	
	45-54	155	64.90%	84	35.10%	
	55+	59	73.80%	21	26.30%	
Gender	Male	259	69.10%	116	30.90%	0.269
	Female	744	66.00%	384	34.00%	
Residence	Urban	890	67.50%	429	32.50%	0.102
	Rural	113	61.40%	71	38.60%	
	Basic	30	73.20%	11	26.80%	
Education	Secondary	176	64.50%	97	35.50%	0.486
	University	797	67.00%	392	33.00%	
	Not working	170	68.80%	77	31.20%	
Work	Student	318	67.10%	156	32.90%	0.8
	Retired	82	64.10%	46	35.90%	
	Working	433	66.20%	221	33.80%	
Marital status	Single	483	66.70%	241	33.30%	0.498
	Married	492	66.30%	250	33.70%	
	Divorced/widow	28	75.70%	9	24.30%	
Have you ever been told that the appearance of your teeth is inappropriate?	Yes	317	63.30%	184	36.70%	.044*
	No	686	68.50%	316	31.50%	
	Never	28	71.80%	11	28.20%	
Daily tooth brushing	Sometimes	276	65.60%	145	34.40%	0.687
	usually	699	67.00%	344	33.00%	
	Yes	560	85.20%	97	14.80%	
Are you satisfied with the colour of your teeth?	No	443	52.00%	409	48.00%	0.001*
	Yes	155	44.90%	190	55.10%	
Have crowded teeth	No	848	72.90%	316	27.10%	0.001*
	Yes	207	55.60%	165	44.40%	
Protruded frontal upper teeth	No	796	70.00%	341	30.00%	0.001*
	Yes	47	50.50%	46	49.50%	
Protruded lower jaw	No	956	67.50%	460	32.50%	0.001*
	Yes	166	49.70%	168	50.30%	
Frontal tooth caries	No	837	71.20%	338	28.80%	0.001*
	Yes	225	52.70%	202	47.30%	
Unsatisfactory frontal tooth fillings	No	778	71.90%	304	28.10%	0.001*
	Yes	159	50.00%	159	50.00%	
Broken frontal tooth	No	844	70.90%	347	29.10%	0.001*
	Yes					

Uncover teeth during laughing	Yes	110	28.50%	276	71.50%	0.001*
	No	893	79.50%	230	20.50%	
Red inflamed gum	Yes	157	48.90%	164	51.10%	0.001*
	No	846	71.20%	342	28.80%	
The appearance of a large area of gum while laughing?	Yes	122	46.20%	142	53.80%	0.001*
	No	881	70.80%	364	29.20%	

Note: P value is less than 0.05; p values : significant association

**Factors affecting participants' satisfaction:** Table 5 illustrates simple logistic regression model for factors affecting participants' satisfaction regarding their dental appearance. The model includes all studied factors of which 8 factors were found to have a significant adjusted effect. Factors included urban residence as those who were from urban areas had 1.5 times more satisfaction regarding their dental appearance as related to others keeping all other factors constant (OR=1.45; 95% CI: 1.0-2.14). Considering teeth color; participants with discolored teeth were found to have 74% less satisfaction rate than those who did not suffer tooth discoloration when all other factors were adjusted (OR=0.26; 95% CI: 0.19-0.34). As for crowding, participants with crowded teeth had 59% less satisfaction rate adjusting for other factors (OR=0.41; 95% CI: 0.30-0.56). Moreover, participants with unsatisfactory frontal teeth filling reported 58% less satisfaction rate compared to those without (OR=0.62; 95% CI: 0.45-0.85). Broken frontal teeth were associated with 32% less satisfaction rate regarding tooth appearance (OR=0.68; 95% CI: 0.49-0.93). Besides, participants who uncover their teeth while smiling were 6 times more satisfied than others who cover their teeth on smiling (OR=6.54; 95% CI: 4.85-8.80). Red inflamed gum was associated with 31% less satisfaction than others keeping all other factors constant (OR=0.69; 95% CI: 0.50-0.95). Participants who experience a display of a large gum area while smiling were 38% less satisfied as compared to others (OR=0.62; 95% CI: 0.44-0.88).

**Table 5: Simple logistic regression model for factors affecting participants' satisfaction regarding dental appearance.**

Factors	B	S.E.	Sig.	ORA	95% C.I for ORA	
					Lower	Upper
Age	0.03	0.09	0.707	1.04	0.86	1.24
Male	0.11	0.17	0.529	1.1	0.79	1.56
Urban residence	0.38	0.2	0.049	1.45	1	2.14
High Education	0.03	0.14	0.825	1.03	0.78	1.37
Working	-0.08	0.07	0.225	0.92	0.8	1.05
Married	-0.04	0.17	0.804	0.96	0.69	1.34
Inappropriate teeth coloured	-0.23	0.14	0.106	0.79	0.6	1.05
Crowded teeth	-0.89	0.16	0.001	0.41	0.3	0.56
Protrusion	-0.14	0.15	0.349	0.87	0.64	1.17
Protruded lower jaw	-0.23	0.28	0.409	0.8	0.46	1.37
Dental caries	-0.07	0.17	0.69	0.93	0.66	1.31

Unsatisfactory frontal tooth fillings	-0.48	0.16	0.003	0.62	0.45	0.85
Broken frontal tooth	-0.39	0.17	0.018	0.68	0.49	0.93
Uncover teeth during smile	1.88	0.15	0.001	6.54	4.85	8.8
Red inflamed gum	-0.38	0.16	0.021	0.69	0.5	0.95
The appearance of a large area of gum while laughing	-0.47	0.18	0.007	0.62	0.44	0.88
Constant	-5.33	1.09	0	0		

## Discussion

Perceived dental appearance varies among different populations and among individuals in the same population [19]. The current study found that among the 1503 Saudi adults who responded to the online questionnaire, 66.5% were satisfied with their dental appearance and smile. This finding came in accordance with earlier studies conducted among different populations. For instance, Akarslan and colleagues in their study which included 1,014 patients at a dental school in Ankara, Turkey reported that (57.3%) were satisfied with their dental appearance [16]. Similarly, 76% of stratified sample of adults in the United Kingdom reported self-satisfaction with their dental aesthetics [20]. However, dissimilar findings were cited by a study conducted in Malaysia, where the prevalence of dissatisfaction with dental appearance was estimated to be 62.7% among the studied population [21].

In the literature, the determining factors of perceived dental appearance were found to be cultural factors and individual preferences which differ among individuals and cultures and vary over time [1]. Generally, older individuals (aged 55 and above) were reported to be more likely satisfied with their dental appearance as compared to younger age groups [16, 20], pointing out to the fact that their dental aesthetics is not as imperative to older than to younger people [19]. The present study, however, found no significant association between age and satisfaction with dental aesthetics reflecting that dental appearance is becoming likewise important in both older and younger adult populations. Similar conclusion was cited in another study which attributed finding to the strong influence of the media which enhance males and females of all ages to seek looking younger and healthier [21]. Another study of 180 individuals took six different age groups ranging from 13 to 64 years cited that self-satisfaction with tooth color was not age-dependent [22]. A Sweden research conducted with two large samples of 8,881 and 8,563 aged 50 and 60 years respectively, revealed that most of the participants in both age groups consider aesthetically pleasant teeth are of paramount importance [23]. One more study on aged individuals of 73 to 75 year-old in Germany, reported that the significance of dental aesthetics to general appearance was considered key by the participants [24].

It is a popular belief that females are more considered about their appearance than males. Indeed, women patients were found to be more concerned with their dental appearance than men besides being more precarious in judging their dental appearance [19, 24]. Several results reported women to express

greater dissatisfaction with dental appearance and tooth color than men. While a study in Sweden cited that men considered dental appearance as more important than women [14, 23]. The present study, on the other hand, found that the differences between genders were not significant. Similar findings were reported in the literature [16, 25].

Although “Teeth whitening” treatment was amongst the preferred dental treatments chosen by the studied population constituting (73.0%), however, the most frequently reported required dental interventions were found to be “teeth cleaning, gum treatment and polishing” (followed by “cosmetic fillings” for teeth with caries. This preference of “easier and less painful” dental treatments over the more invasive interventions such as teeth veneers and crowns came in accordance with many previous studies which reported “bleaching” as the most-desired basic dental intervention to improve dental appearance [21]. This could be justified by the fact that many patients were dissatisfied with their dental appearance. Furthermore, a study of 180 female patients in South London showed that whitened teeth were favored over teeth with original color with the former linked to superior attractiveness [5].

Logistic regression model indicated that participants with discolored anterior teeth had 74% less satisfaction rate than those who did not suffer tooth discoloration when all other factors were adjusted (OR=0.26; 95% CI: 0.19-0.34). Likewise, a research conducted by Maghaireh, et al. indicated that only a few number of the individuals were satisfied with the color of their anterior teeth and that the patients’ general satisfaction with dental appearance was influenced significantly by anterior teeth color [26]. This may be justified by the fact that individuals may favor white and shiny teeth over natural appearance, and individuals lean towards rating the shade of their teeth darker than the professional or the actual shade [27].

Several scholars found that self-reported mal-aligned teeth and upper anterior crowding are linked to individuals’ satisfaction with dental appearance [14, 28]. Moreover, People who perceived their facial profiles as being unlike typical ones, showed an increased probability of being dissatisfied with their facial appearance [29]. Teeth mal-alignment and crowding are amongst the commonest malocclusion traits cited in the literature [30-32], the present study revealed a strong association between individuals’ perceptions of having these traits and contentment with general dental appearance. However, these findings contradict the results of the study conducted in Malaysia by Tin-Oo and colleagues [21]. These divergences underlined the wide individual discrepancy in perception of adequate occlusal features. Comparative data in the present research found that the most commonly self-reported dental problems affecting individuals’ satisfaction were unsatisfactory frontal tooth fillings (28.3%), this might be attributed to the fact that unacceptable frontal restorations affect both teeth color and alignment and hence affecting the individuals’ general dental appearance.

The present study indicated a significant direct relation between self-perceived dental satisfaction and being informed by other individuals about their dental problems with a recorded statistical significance (P=0.044). This finding highlights the psychological influence of the surrounding environment on

individuals' appreciation of their appearance. However, this factor was not studied earlier as a possible contributing factor to self-perceived dental satisfaction; therefore, further studies are required in this context.

## Conclusion

Two third of the respondents were generally satisfied with their dental appearance. The most reported dental problem was found to be discolored unsatisfactory frontal tooth fillings (28.3%). 8 factors were found to have a significant adjusted effect on participants' satisfaction including urban residence, teeth color, crowding, unsatisfactory frontal teeth filling, broken frontal teeth, red inflamed gum, covering teeth while smiling and extent of gum display while smiling. One third of respondents reported being informed by others that the appearance of their teeth is inappropriate. Relevant findings highlight the possible psychological influence of the surrounding environment on individuals' appreciation of their appearance.

## Limitations

This study finding may be limited by being entirely based on self-reports by participants, as no attempts were made to correlate participants' self-perceived evaluation of their dental problems and their dental records or to compare participants' preferred dental treatments and professional assessments of their actual treatment needs. Nevertheless, the characteristically subjective nature of dental satisfaction qualifies this research, a valuable relevant data in dental care of young adults particularly in this era, where individual-oriented dental care delivery approach is preferred over dentist-oriented dental care delivery approach.

## Author Contributions

Conceptualization: H.L.A., S.M.A., T.S.G. and R.T.; data curation: S.M.A., W.A.A. and A.E.E.; formal analysis: H.L.A. and A.E.E.; investigation: S.M.A., T.S.G., R.T. and H.L.A.; methodology: H.L.A. and M.M.M.; software: H.L.A., S.M.A., W.A.A. and A.E.E.; supervision: H.L.A. and A.E.E.; validation: M.M.M.; writing – Original Draft Preparation: M.M.M. and H.L.A.; writing – Review & Editing: M.M.M., H.L.A. and S.M.A. All authors have read and agreed to the published version of the manuscript.

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