

PUBLIC PERCEPTION AND MOTIVATION FOR PROSTHODONTIC REHABILITATION IN SAUDI ARABIA

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Abstract

Objective: The present study aimed at assessing public's perception (knowledge and attitude) and motivation for prosthodontic rehabilitation in Saudi Arabia. **Materials and methods:** The present cross-sectional study was conducted in Saudi Arabia using an online survey questionnaire, from September 2020 to March 2021. A self-constructed questionnaire was designed on Google forms, and the online survey link was circulated through social media, the response being obtained through online survey submission. The questionnaire comprised 32 closed-ended questions, categorized into three sections, to assess the demographic details, participants' perceptions regarding the prosthodontic treatment and type of prosthodontic treatment received, and motivation for investigating them in addition to the problems and satisfaction following treatment. All data was analysed using SPSS v.24. Parametric continuous data was presented as mean and standard deviation (SD), and categorical data - as frequency and percentage. **Results and discussion:** The study included 3,038 participants, out of which the majority, 2,675 (68.6%), were females. Around 71.4% of the participants were aware of the prosthodontic specialty. The mean overall satisfaction of participants after prosthodontic rehabilitation was 6.96 ± 2.54 , participants > 56 years being more satisfied than other age groups. There was a significant variation as to the reasons that motivated participants to visit dentists, in terms of age ($p=0.015$), income ($p=0.001$), education ($p=0.004$) and job ($p<0.001$). **Conclusions:** Patient perceptions and motivation for seeking prosthodontic rehabilitation vary, based on demographic factors, such as socioeconomic status, knowledge level, gender, and age. Most patients in Saudi Arabia trusted their family and friends' advice rather than celebrity or influencer advertisement in seeking prosthodontic care.

Keywords: attitude, knowledge, motivation, prosthodontics, satisfaction.

1. INTRODUCTION

Edentulism is a debilitating and permanent disorder referred to as the "final marker of disease burden for oral health" [1]. Although the rate of edentulism has decreased in the previous decade, it still remains a prominent disease worldwide, particularly among the elderly. Edentulism impacts an individual's aesthetic, functional, phonetic, psychological, and social aspects. As a result, patients express a desire to replace missing teeth [2]. Currently, a new perspective on dentistry recognizes patient's feelings or psychological essence concerning the dental condition. Dental treatment, particularly prosthodontics, plays a vital role in replacing and restoring teeth, improving appearance, restoring function, and raising individual's self-esteem [3]. The number of persons in need of more prosthodontic care increases with age, especially in patients with poor oral health and tooth loss, total mishap, or edentulism, which is proportional to dental loss [2].

Replacement of missing teeth in a healthy incomplete dentition up to complete rehabilitation of the significantly damaged teeth to functional form is an example of prosthetic treatment. The patient has various prosthetic treatment options for replacing the missing teeth, including removable or fixed partial dentures, complete dentures, implant-supported dentures, and

over-denture [4,5]. Replacement of lost teeth is seen as a patient-chosen option driven by various factors, including age, sex, occupation, socioeconomic status, oral health knowledge, and education, in addition to his/ her perceptions about socialization and function [1,4,6]. Furthermore, consideration of comparative costs, treatment load associated with each treatment option, and long-term performance expectations are other factors to consider when selecting available options for the treatment of edentulism [6]. Shrirao *et al.*, in 2016 [3], analysed the factors affecting decision-making and selection of dental prostheses by patients, demonstrating that most of them declined the proposed treatment plan and accepted the alternative one. The most common reason for such a behavior was the high treatment cost. Prosthodontic rehabilitation is adequate and satisfactory when the patient is delighted and informed about the various treatment options available, as well as how to use and maintain them [7].

Patients trust their dentists, considering that their well-being is paramount to them, as dentists offer advice that helps an informed decision about treatment. Patients will question which dentist is better or more competent if dentists advertise that they can provide services better than their fellow dentists. However, all dental health providers have an acceptable level of competence through licensure [8]. Previously, it was assumed that marketing and advertising were beyond the dignity of the medical profession and that the only way to obtain new patients was through referrals from satisfied patients and favorable feedback from other professionals. Such thinking is no longer consistent with the needs of today's patients, who want to be better informed. It is now regarded ethical for health institutions or individual dentists to promote their work as long as the information is accurate, truthful, non-discriminatory, and not misleading [9].

On the contrary, smile makeover (the so-called Hollywood smile) with needless and costly veneers, vouchers that offer a variety of services at reduced price or even for free, and offers like "teeth in a day," "crowns in an hour" are some examples of prosthodontics marketing strategies or social media advertisements aimed

at promoting healthcare facilities to attract and preserve patients [8-10]. Public's choice of numerous aesthetic dental treatments, particularly the Hollywood smile, has been influenced by continual exposure of personal life and constant sharing of posts on social media [11,12]. Nevertheless, the content of such promotional strategies or advertisements must be accurate and not create unrealistic expectations.

There have been few valuable studies on this topic performed around the world [2,10,13-18], which identified the disparity among Saudi population regarding perception of prosthodontic treatments. Typically, most studies on the Saudi population have targeted a particular region [2,13,18] rather than a nationwide survey.

Therefore, the present study assessed public's perceptions and motivation for seeking prosthodontic rehabilitation in Saudi Arabia. Specifically, the aims of this study were:

- To appreciate the public knowledge and attitude towards prosthodontic rehabilitation in Saudi Arabia and the characteristics of the prosthodontic treatment received.
- To investigate the rationale that motivates patients to seek prosthodontic treatments and consultations, which may be needed or not.
- To evaluate the aesthetic importance and the effects of internet marketing, social media, imaginary offers and guarantees, and the shiny names of such services and treatments, even if unnecessary.
- To evaluate patient satisfaction following prosthodontic treatment.

2. MATERIALS AND METHODS

Study design and ethical approval

The current study is a cross-sectional descriptive questionnaire research investigating public perception and motivation to seek prosthodontic care in Saudi Arabia, conducted from September 2020 to March 2021 after obtaining ethical approval from the Institutional Review Board (# E-20-5534) at "King Saud" University. Informed consent was obtained from all subjects willing to participate.

Questionnaire components and compilation

A self-constructed questionnaire was designed on Google forms, and the online survey link was circulated through social media, responses being obtained through an online survey submission. The questionnaire comprised 32 closed-ended questions, categorized into three sections. The questions were compiled by the listed authors of the present study through an open-end discussion and further reviewed to add any missing components. The questions were framed to gather adequate information regarding the public perception and motivation for seeking prosthodontics care.

The first section contained demographic details on participants: age, gender, nationality, region, educational level, income (Saudi Arabian riyal (SAR)), and employment status. The second section of the questionnaire was divided into two parts. The first covered participant's perceptions about prosthodontic care (knowledge, attitude, Hollywood smile, reliability in social media marketing, and clinic advertisement). The last question in the first part of the first section (Have you ever had a dental prosthesis, removable dentures, or dental implants or prosthodontic treatments?) required answers: 'yes' or 'no.' If participant answered 'no,' the survey ends. If participant answered 'yes,' that infers they have received prosthodontic treatment and can respond to the second part in the second section of the questionnaire. The second part assessed the characteristic of the treatment received (when and who provided it, type of treatment, follow-up appointments and post-treatment instructions).

The third section contained questions regarding self-reported reasons or motivation to undergo prosthodontic treatment (influence of clinic advertisement or celebrity on seeking treatment, patient experience with treatment cost and prosthodontist). In the last part of the third section, participants were asked to report any post-treatment complications experienced and to rate their overall treatment satisfaction, out of 10 on a visual analog scale (VAS), with 1 being completely dissatisfied and 10 being completely satisfied [19].

Questionnaire translation into Arabic language and validity

The compiled questionnaire was translated into Arabic by two professors well-versed in both English and Arabic languages, from the Periodontics and Community Dentistry Department (PCS), College of Dentistry, "King Saud" University. The two translations were compared and amended accordingly to obtain a final blueprint. Subsequently, the final blueprint was interpreted back into the Arabic language by a translator well-versed in both English and Arabic languages. Another professor compared the two interpreted versions, and a few minor amendments were applied to the final Arabic version. The material validity ratio (CVR) of the questionnaires was calculated using Cohen's Kappa Index, a Kappa (κ) of > 0.82 indicating a good agreement.

Pilot testing and reliability

The questionnaires were pilot-tested on a heterogeneous sample of 50 participants across different regions of Saudi Arabia, to assess the reliability of the final Arabic version. The questions were convenient for the sample respondents expected to answer, and the survey was completed in less than 20 minutes. The reliability of the questionnaire was determined using inferential Cronbach Alpha analysis, which revealed a value of 0.85, suggesting a good reliability. Data from the pilot study was excluded from the final analysis.

Statistical analysis

Data from the survey was analyzed using SPSS (IBM SPSS, Chicago, IL, USA) v.24 for windows. The normality of data distribution was tested using the Shapiro-Wilk tests. Parametric continuous data was presented as mean and standard deviation (SD). Categorical data was presented as frequency and percentage. Comparisons between continuous variables were conducted using the independent t-test and ANOVA test, followed by the least significant difference (LSD) *post-hoc* analysis. Chi-square and Fisher-Exact tests were used to check the significance between categorical variables. A p -value < 0.05 was considered statistically significant.

3. RESULTS

A total of 3,038 subjects participated, out of which the majority 2,083 (68.6%) were females. Among them, 59.8% were aged between 15 and 35 years, and 29.9% were between 36 and 55 years. Most of them were Saudi nationals (88.1%). Participants from the western and central regions constituted the largest portion of this study (51.2% and 32.4%, respectively). Regarding education, 62.1% were in university, 24.2% were in high school, 8.5% were postgraduates, and 4.1% were in middle school. In terms of income, 45.6% earned less than 3,000 SAR, 25.4% earned 3,000-10,000 SAR, and 20.2% earned 11,000-20,000 SAR. Approximately 28.5% of the participants were not employed, 27.5% were students, 18.10% worked in the private sector, 13.42% managed their own business, and 11.38% were retired (Table 1).

Table 1. Demographic details of participants

Section I. Demographic parameters		n (%)
Age (Years)		
	15-35	1817 (59.8%)
	36-55	908 (29.9%)
	56-65	256 (8.4%)
	>65	57 (1.9%)
Gender		
	Male	955 (31.4%)
	Female	2083 (68.6%)
Nationality		
	Saudi	2675 (88.1%)
	Non-Saudi	363 (11.9%)
Region		
	Central region	985 (32.4%)
	Eastern region	230 (7.6%)
	Northern region	101 (3.3%)
	Southern region	167 (5.5%)
	Western region	1555 (51.2%)

Education		
	Uneducated	7 (0.2%)
	Primary school	26 (0.9%)
	Middle school	125 (4.1%)
	High school	736 (24.2%)
	University	1886 (62.1%)
	Postgraduate	258 (8.5%)
Income (SAR)		
	< 3,000	1384 (45.6%)
	3,000 - 10,000	772 (25.4%)
	11,000 - 20,000	614 (20.2%)
	21,000 - 30,000	173 (5.7%)
	> 30,000	95 (3.1%)
Employment status		
	Student	835 (27.4%)
	Government sector	46 (1.5%)
	Private sector	550 (18.1%)
	Self-employed	408 (13.4%)
	Unemployed	867 (28.5%)
	Retired	346 (11.3%)

Around 80.95% of the participants were aware of the different specialties in dentistry and 71.4% were aware of the prosthodontic specialty. Only 35.9% agreed to receive dental veneers and crowns (Hollywood smile) for aesthetic purposes. Interestingly, only 10.7% of them trusted the credibility of what is offered by influencers and marketers of cosmetic dental clinics and their services on social media, while 8.6% trusted the reliability of what is offered in cosmetic dentistry products online and on social media sites. Further, only 25.7% felt that showing pictures about dental treatment or cosmetic cases on social media will drive them to get veneer, crowns, Hollywood smile, or dental implants. In terms of the impact of social media influencers with a Hollywood smile on participant's confidence, 70.6% of them deny that they had any impact. About 57.1% refused to get prosthetic dental treatment from a general dentist (Table 2).

Table 2. Public perception of prosthodontic treatment and characteristics of the prosthetic dental treatment

Section II. Part 1. Questions		n (%)
Did you know there exist different specialties in dentistry?		
	No	358 (12.7%)
	Yes	2,459 (80.9%)
	Maybe	194 (6.4%)
Did you know about prosthodontic specialty in dentistry? (crowns, bridges and veneers)		
	No	613 (20.2%)
	Yes	2,169 (71.4%)
	Maybe	256 (8.4%)
Do you agree to receive a Hollywood smile for aesthetic purposes?		
	No	1,080 (35.5%)
	Yes	1,090 (35.9%)
	Maybe	868 (28.6%)
Do you trust the influencers and promoters of cosmetic dental clinics and their services on social media accounts and sites?		
	No	1,984 (65.3%)
	Yes	326 (10.7%)
	Maybe	728 (24.0%)
Do you trust the reliability of what is offered in cosmetic dentistry products online and on social media platforms?		
	No	2,111 (69.5%)
	Yes	260 (8.6%)
	Maybe	667 (22.0%)
Do you think that showing pictures about dental treatment or cosmetic cases on social media will encourage you to get veneer, crowns, Hollywood smile, or dental implants?		
	No	1,455 (47.9%)
	Yes	782 (25.7%)
	Maybe	801 (26.4%)
In your opinion, what is the main reason that might push you to receive dental implants or veneers?		

	Healing	2,271 (74.8%)
	Cosmetic	767 (25.2%)
Are social media influencers with a Hollywood smile affecting your confidence?		
	No	2,146 (70.6%)
	Yes	420 (13.8%)
	Maybe	472 (15.5%)
Do you agree to receive dental crowns or removable dentures provided by a general dentist?		
	No	1,734 (57.1%)
	Yes	609 (20.0%)
	Maybe	695 (22.9%)
Have you ever received dental crowns, removable dentures, or dental implants?		
	No, because there are no specialized clinics	44 (1.4%)
	No, due to my fear of visiting the dentist	86 (2.8%)
	No, due to the high fees	458 (15.1%)
	No, for neglecting my dental health	99 (3.3%)
	No, for other reasons	212 (7.0%)
	No, I don't need it	1,231 (39.9%)
	Yes, I received it	926 (30.4%)
Section II. Part 2. Questions		
When did you receive the treatment?		
	< one year	213 (23.00%)
	1 to 5 years	404 (43.62%)
	6 to 10 years	169 (18.25%)
	> 10 years	140 (15.11%)
Where did you get the treatment?		
	Government hospital	118 (12.74%)
	Private hospital	684 (73.86%)
	Clinics of dental school	52 (5.615%)
	Clinics not in Saudi Arabia	72 (7.775%)
The treatment you received was from		

	Dental intern	78 (8.42%)
	Dental student	4 (0.43%)
	General dentist	292 (31.5%)
	Prosthodontic specialist	336 (36.2%)
	Prosthodontic consultant	216 (23.3%)
Did the dentist advise you to use specialized dental cleaning tools (dental floss, interdental brush, under-bridges water FLOSS)?		
	No	335 (36.18%)
	Yes	478 (51.62%)
	Maybe	113 (12.20%)
Do you keep the follow up appointments with the prosthodontist?		
	No	335 (36.18%)
	Yes	420 (45.36%)
	Maybe	171 (18.47%)
Did you receive sufficient information from the dentist about different treatment options suitable for your condition (if found)?		
	No	261 (28.19%)
	Yes	520 (56.16%)
	Maybe	145 (15.66%)
Did you receive sufficient information by the dentist about the advantage and disadvantage of treatment?		
	No	310 (33.48%)
	Yes	474 (51.19%)
	Maybe	142 (15.33%)
Have you ever been informed to change the treatment type or alter the given treatment plan by the dentist?		
	No	604 (65.23%)
	Yes	210 (22.68%)
	Maybe	112 (12.10%)

Out of the 3,038 participants, 926 had received prosthodontic treatment, while the remaining 2,112 had received no treatment and ended the survey. Among the participants who had received treatment, the dental crown was the most common (48.60%), followed by bridges (23.33%), implants (13.50%), veneers for more than one

tooth (6.70%), veneer for a single tooth (4.97%), and removable denture (2.92%) (Fig. 1).

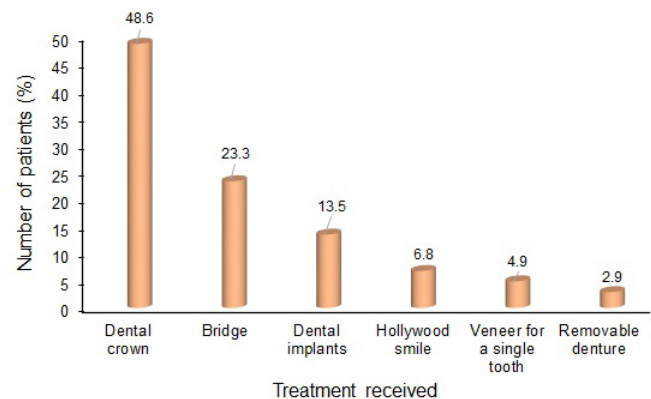


Fig. 1. Prosthetic dental treatment received by the participants

2.48% of the patients were encouraged to visit the dentist by the advertisement from a celebrity or social media advertisement. The previous experience was reasonable in terms of costs and treatment for 53.78% of the participants (Table 3).

Table 3. Self-reported reasons that motivated participants to visit the dentist

Section III Questions		n (%)
What is the main reasons that drive you to choose your dentist?		
	Advice from family and friends	487 (52.59%)
	Advertisement from a celebrity or an influencer (social media)	23 (2.48%)
	Referrals	74 (7.99%)
	Discount coupon/Low-fees	34 (3.67%)
	Insurance supporter	52 (5.62%)
	Close to home or work	199 (21.49%)
	Well-Known Expert	29 (3.13%)
	Personal Preference	13 (1.40%)
	No specific reason	8 (0.86%)
	He/ She is my friend/ colleague/family	7 (0.76%)
If your answer is an advertisement from celebrity or influencer/propagandist in various social media programs, what is the main reason that has your attention to the advertisement of the prosthodontist and to receive treatment from him?		

Recommending influencers and celebrities	11 (52.38%)
Hollywood smiles	1 (4.76%)
Lifetime guarantee	1 (4.76%)
Low price	5 (23.80%)
Without anesthesia and pain	1 (4.76%)
The cost of crowns include dental treatments	2 (9.52%)
Do you advise others to deal with clinics advertised on social media or something like this?	
No	308 (33.33%)
Yes	396 (42.85%)
Maybe	222 (23.80%)
Did your previous experience with a prosthodontist end in unexpected cost and treatment?	
Yes, it was unexpected	428 (46.22%)
No, it was a reasonable treatment	498 (53.78%)

Figure 2 summarizes the incidence of the post-treatment complications experienced by patients. The most common complication was food impaction under crowns (17.17%) and speech and speaking problems (2.31%), respectively.

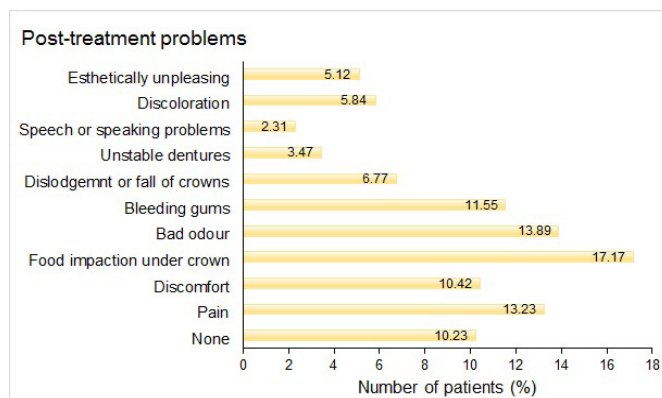


Fig. 2. The frequency of the post-treatment complications reported by the study participants

The mean satisfaction score of the participants following treatment was 6.96 ± 2.54 . Participants aged 56 years and above were more satisfied than the younger ones. There was no significant difference between genders in terms of satisfaction. Likewise, we could not identify any significant difference between Saudi and non-Saudi participants and the included regions. Participants who work in governmental or

private sectors were less satisfied than the retired participants (Table 4).

Table 4. Satisfaction scores of the participants who received prosthodontic treatment (values expressed as mean and standard deviation - SD)

Demographic parameters		Mean $\pm$ SD
Age (Years)		
	15-35	6.98 ± 2.58^a
	36-55	6.71 ± 2.60^a
	56-65	7.52 ± 2.17^b
	>65	$7.62 \pm 2.16^{a,b}$
Gender		
	Male	6.88 ± 2.42^a
	Female	6.98 ± 2.58^a
Nationality		
	Saudi	6.98 ± 2.52^a
	Non-Saudi	6.74 ± 2.76^a
Region		
	Central region	6.61 ± 2.61^a
	Eastern region	6.94 ± 2.61^a
	Northern region	7.33 ± 2.72^a
	Southern region	7.11 ± 2.09^a
	Western region	7.11 ± 2.51^a
Education		
	Uneducated	$6.50 \pm 2.12^{a,b}$
	Primary	$7.60 \pm 3.57^{a,b}$
	Middle School	7.77 ± 2.21^a
	High School	6.21 ± 2.80^b
	University	7.10 ± 2.45^a
	Postgraduate	7.32 ± 2.29^a
Income (SAR)		
	<3,000 SAR	6.69 ± 2.78^a
	3,000 - 10,000 SAR	6.87 ± 2.53^a
	11,000 - 20,000 SAR	7.08 ± 2.37^a
	21,000 - 30,000 SAR	7.53 ± 2.33^a
	> 30,000 SAR	7.66 ± 2.07^a
Employment status		

Student	6.91 ± 2.77 ^{a,b}
Government sector	6.81 ± 2.52 ^b
Private sector	6.75 ± 2.42 ^b
Self-employed	6.55 ± 2.73 ^{a,b}
Unemployed	6.99 ± 2.64 ^{a,b}
Retired	7.38 ± 2.22 ^a

LSD *post-hoc* analysis: Different superscripts within the demographic variables are significantly different at $p < 0.05$.

Interestingly, we observed that patients who received dental crowns or bridges were less satisfied than those who received dental implants or veneer for a single tooth. Patients who received treatment in government hospitals were more satisfied than those from private centers, clinics of dental schools, or non-Saudi clinics. Besides, patients who dealt with prosthodontist consultants or dental students (under supervision) were more satisfied than those who visited a general dentist. Moreover, patients who kept the follow-up appointments were more satisfied than those who missed their appointments. Similarly, a higher satisfaction score was observed in those who received sufficient information about the advantages and disadvantages of the treatment and on the alternative treatment options. On the contrary, patients who were asked to change their treatment plan were less satisfied (Table 5).

Table 5. Satisfaction scores of participants related to their treatment characteristics (values are expressed as mean and standard deviation -SD)

Questions	Mean ± SD
What kind of treatment did you receive?	
Veneer for a single tooth	7.80 ± 2.27 ^a
Hollywood smile	6.27 ± 2.89 ^b
Dental crown	6.87 ± 2.44 ^b
Bridge	6.66 ± 2.77 ^b
Removable denture	7.19 ± 2.39 ^{a,b}
Dental implants	7.78 ± 2.16 ^a
When did you get the treatment?	
< one year	7.37 ± 2.26 ^a
1 to 5 years	6.69 ± 2.55 ^b
6 to 10 years	6.75 ± 2.64 ^b
> 10 years	7.37 ± 2.65 ^a
Where did you get treatment?	

Government hospital	8.21 ± 1.90 ^a
Private hospital	6.68 ± 2.56 ^b
Clinics of dental school	7.32 ± 2.69 ^b
Clinics not in Saudi Arabia	7.26 ± 2.54 ^b
The treatment you received was from	
Dental intern	7.33 ± 2.68 ^a
Dental student	6.97 ± 2.42 ^a
General dentist	5.89 ± 2.56 ^b
Prosthodontist specialist	8.00 ± 1.82 ^{a,b,c}
Prosthodontist consultant	8.21 ± 1.97 ^c
Did the dentist advise you to use specialized dental cleaning tools (dental floss, interdental brush, under-bridges water FLOSS)?	
No	6.03 ± 2.65 ^a
Yes	7.63 ± 2.27 ^b
Maybe	6.87 ± 2.37 ^c
Do you keep the follow-up appointments with the prosthodontist?	
No	6.39 ± 2.62 ^a
Yes	7.32 ± 2.46 ^b
Maybe	7.17 ± 2.36 ^b
Did you receive sufficient information about different treatment options suitable for your condition by the dentist (if found)?	
No	5.74 ± 2.84 ^a
Yes	7.69 ± 2.14 ^b
Maybe	6.53 ± 2.32 ^c
Did you receive sufficient information from the dentist about the advantage and disadvantage of a treatment?	
No	5.81 ± 2.73 ^a
Yes	7.78 ± 2.17 ^b
Maybe	6.71 ± 2.20 ^c
Have you ever been informed to change the treatment type or alter the given treatment plan by the dentist?	
No	7.12 ± 2.56 ^a
Yes	6.62 ± 2.56 ^b
Maybe	6.69 ± 2.32 ^b

Most participants (52.5%) visited their prosthodontist on advice from family or friends and 14.1% - due to discount coupons and low cost. There was no significant difference between males and females in terms of reasons to visit a prosthodontist ($p=0.549$). However, there was a significant difference in the reasons that encouraged them to visit a prosthodontist based on age ($p=0.015$), income ($p=0.001$), job ($p<0.001$), and education ($p=0.004$) (Table 6).

Table 6. Patient's reasons to visit a prosthodontist, related to demographic parameters

Demographic parameters		Advice from family and friends	Advertising from a celebrity or social media	Referrals	Discount coupon/ Low-cost	Insurance support	Close to home or work	Well-known expert	Personal preference	No specific reason	He/ She is my friend/ colleague/ family	*P-value
Gender	Female	354 (51.8%)	18 (2.6%)	55 (8%)	25 (3.7%)	34 (5%)	158 (23.1%)	20 (2.9%)	2 (1.2%)	7 (1%)	5 (7%)	0.549
	Male	133 (55%)	5 (2.1%)	19 (7.9%)	9 (3.7%)	18 (7.4%)	41 (16.9%)	9 (3.7%)	5 (2.1%)	1 (4%)	2 (0.8%)	
Age (Years)	15-35	201 (54.9%)	13 (3.6%)	27 (7.4%)	15 (4.1%)	23 (6.3%)	68 (18.6%)	11 (3.0%)	1 (3%)	5 (1.4%)	2 (5%)	0.015*
	36-55	205 (50.9%)	8 (2.0%)	27 (6.7%)	12 (3.0%)	23 (5.7%)	102 (25.3%)	13 (3.2%)	9 (2.2%)	3 (7%)	1 (2%)	
	56-65	66 (51.6%)	2 (1.6%)	17(13.3%)	7 (5.5%)	2 (1.6%)	23 (18 %)	4 (3.1%)	3 (2.3%)	0 (0.0%)	4 (3.1%)	
	>65	15 (51.7%)	0 (0.0%)	3(10.3%)	0 (0.0%)	4 (13.8%)	6 (20.7%)	1 (3.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Nationality	Saudi	49 (62.8%)	2 (2.6%)	4 (5.1%)	11 (14.1%)	4 (5.1%)	6 (7.7%)	1 (1.3%)	1 (1.3%)	0 (0.0%)	0 (0.0%)	<0.001*
	Non-Saudi	438 (51.7%)	21 (2.5%)	70 (8.3%)	23 (2.7%)	48 (5.7%)	193 (22.8%)	28 (3.3%)	12 (1.4%)	8 (0.9%)	7 (0.8%)	
Income (SAR)	< 3000	147 (53.3%)	9 (3.3%)	28(10.1%)	12 (4.3%)	8 (2.9%)	60 (21.7%)	8 (2.9%)	1 (4%)	3 (1.1%)	0 (0.0%)	0.001*
	3000 - 10,000	141 (51.5%)	6 (2.2%)	17 (6.2%)	16 (5.8%)	20 (7.3%)	53 (19.3%)	7 (2.6%)	10 (3.6%)	3 (1.1%)	1 (4%)	
	11,000 - 20,000	143 (53.8%)	4 (1.5%)	18 (6.8%)	4 (1.5%)	19 (7.1%)	66 (24.8%)	7 (2.6%)	2 (8%)	1 (4%)	2 (8%)	
	21,000 - 30,000	43 (57.3%)	2 (2.7%)	6 (8.0%)	2 (2.7%)	2 (2.7%)	11 (14.7%)	6 (8.0%)	0 (0.0%)	0 (0.0%)	3 (4.0%)	
	> 30,000	13 (37.1%)	2 (5.7%)	5 (14.3%)	0 (0.0%)	3 (8.6%)	9 (25.7%)	1 (2.9%)	0 (0.0%)	1 (2.9%)	1 (2.9%)	
Job	Student	87 (63.0%)	5 (3.6%)	12 (8.7%)	2 (1.4%)	8 (5.8%)	18 (13.0%)	4 (2.9%)	0 (0.0%)	2 (1.4%)	0 (0.0%)	<0.001*
	Government sector	119 (55.1%)	5 (2.3%)	14 (6.5%)	2 (9%)	10 (4.6%)	57 (26.4%)	5 (2.3%)	2 (9%)	1 (5%)	1 (5%)	
	Private sector	57 (48.3%)	3 (2.5%)	7 (5.9%)	11 (9.3%)	15 (12.7%)	18 (15.3%)	3 (2.5%)	1 (8%)	2 (1.7%)	1 (8%)	
	Self-employed	21 (52.5%)	0 (0.0%)	5 (12.5%)	1 (2.5%)	2 (5.0%)	7 (17.5%)	2 (5.0%)	0 (0.0%)	1 (2.5%)	1 (2.5%)	
	Unemployed	104 (43.0%)	8 (3.3%)	24 (9.9%)	11 (4.5%)	11 (4.5%)	66 (27.3%)	9 (3.7%)	7 (2.9%)	2 (8%)	0 (0.0%)	
Education	Retired	99 (57.6%)	2 (1.2%)	12 (7.0%)	7 (4.1%)	6 (3.5%)	33 (19.2%)	6 (3.5%)	3 (1.7%)	0 (0.0%)	4 (2.3%)	0.004*
	Uneducated	2 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
	Primary School	1 (20%)	0 (0%)	2 (40%)	0 (0%)	0 (0%)	2 (40%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
	Middle School	10 (38%)	1 (3%)	3 (11%)	1 (3%)	1 (3%)	9 (34%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	
	High School	96 (48%)	8 (4%)	14 (7%)	16 (8%)	9 (4%)	47 (23%)	1 (1%)	7 (3%)	2 (1%)	0 (0%)	
	University	314 (55%)	11 (1%)	36 (6%)	16 (2%)	30 (5%)	124 (21%)	24 (4%)	6 (1%)	5 (%)	4 (%)	0.004*
	Postgraduate	64 (52%)	3 (2%)	19 (15%)	1 (1%)	12 (9%)	17 (13%)	3 (2%)	0 (0%)	1 (1%)	3 (2%)	
*indicates the statistically significant difference within the demographic parameters (Chi-square and Fisher-Exact test)												

4. DISCUSSION

Teeth play an essential role in maintaining a positive personality. Teeth loss results in substantial impairments and can have a considerable impact on social activities. Furthermore, tooth loss is unpleasant and painful, and it is seen as a major life event that demands a lot of social and psychological adaptation. Public's attitude about tooth loss is changing and, as a result, adults' dental health demands are higher than in the past [20]. As teeth are vital to one's health and attitude, individual's understanding of the various types and approaches to prosthetic tooth replacement is necessary [13,18,21,22]. Similarly, there is a compelling need to analyze public opinion and needs in relation to prosthetic treatment, in order to establish a benchmark. A structured questionnaire that elicits patient perceptions and motivation establishes interaction between the clinician and the patient, fosters trust and confidence, and allows both to express their concerns about the treatment [23]. Therefore, in the present study, we assessed public's perceptions and motivation for seeking prosthodontic rehabilitation in Saudi Arabia using a close-ended questionnaire which helps overcome the disparity between studies involving Saudi population.

60% of the participants in the present study had ages between 15 and 35 years, which is similar to the studies of Reddy *et al.* [18] and Shigli *et al.* [20], where the majority of participants were of younger age group. On the contrary, Gupta *et al.* [4] revealed that participants in their study were between 41 and 50 years. Older patients' perceived disinterest in dental care is attributed to mobility issues, inadequate information, lack of interest in aesthetics and misconceptions about the importance of dental visits [20,24]. The current study showed that female participants (68.6%) outnumbered male participants, which is consistent with previous studies [7,14], but contradicting the findings of others, which reported high number of male participants [4,17,18].

Our participants were found to have fair-minded information, attitude, and motivation

regarding prosthodontic treatment. Their knowledge concerning prosthodontic rehabilitation had a significant correlation ($p \leq 0.05$) with attitude and practice. Baqar *et al.* [14] reported similar results, stating that a lack of understanding about tooth replacement leads to a negative attitude and practice. Dentists are said to have various characteristics that help them gain patients' trust, including high technical capabilities and interpersonal behaviour. In fact, "professional competence" concerns, as well as the form and quality of the patient-professional interaction, are major predictors of total patient satisfaction with any type of clinical practice [23]. However, in addition to the interpersonal relationship and the technical quality of care, healthcare providers must consider other multidimensional approaches of patient satisfaction, such as accessibility and availability of care, costs, outcomes, continuity of care, and physical environment, among others [25].

According to the findings of this study, individuals were aware of the necessity for prosthetic rehabilitation due of media and technology [23]. When asked why they did not seek treatment even though they were aware of prosthetic replacement, the majority said: lack of knowledge. The most effective and influential instruments are advertising and marketing techniques. In our study, 25.7% of the subjects agreed that showing pictures about dental treatment or cosmetic cases on social media will drive them to get veneer, crowns, Hollywood smile and dental implants. The idea of receiving a Hollywood smile is inspired by movie actors' beauty, which has an impact on the lives of the younger generation. Public's choice of numerous aesthetic dental treatments has been influenced by continual exposure of personal life and constant sharing of posts on social media [11,12]. In 2020, Ansari *et al.* [10] evaluated the extent of social media influence on the decision-making process towards choosing a Hollywood smile as an aesthetic treatment in Riyadh city. The majority of participants, in particular women, reported celebrity's smile on social media, this category representing the oldest age group, whereas the term "Hollywood smile" was the most popular among younger participants.

The mean and median satisfaction score of the participants following treatment was 6.96 ± 2.54 , participants aged 56 years and above being more satisfied than the younger ones. This outcome could possibly be explained by the fact that elderly population are more concerned about function than aesthetics, whereas in younger groups, aesthetics is the main concern and it is very difficult to satisfy them. However, we observed significant differences in the reasons that encouraged the participants to visit a prosthodontist, that were dependent on age, income, occupation, and education, which is consistent with the findings of previous studies [3,4,7,15,17,18,22,26].

Around 14.1% of the participants visited the dental clinics due to discount coupons and low cost. The vouchers displaying free or cheaper treatment raise ethical issues, as such strategies to lure patients undermine the dental profession and favor a commercial establishment. In such cases, the quality of services provided at lower cost should not be inferior to those offered at higher cost [8]. Most of the participants sought prosthodontics care due to advice from family or friends. This shows that advertising and influencer marketing strategies have least impact on the Saudi population.

According to Graskemper [8], there are three groups of people to be addressed when advertising or marketing. To begin with, skeptical groups are not easily persuaded by advertising and are hence undeterred by potentially deceptive or unethical advertisements. Secondly, thoughtful groups are reflective and want protection against unethical advertising, because of the sophistication of today's marketing strategies. The majority of promotional advertising aimed at these groups will be seen with interest and a "show me" or "prove it" mentality. The last type is the gullible, who is of particular concern since he/ she places a high value on the information in advertisement and assume it is correct. As a result, potentially deceptive or unethical advertising would have a major impact on this group, thus requiring more protection against unethical advertisements. However, also worth recalling is that all types of patients, some more than others, are more likely to trust dentistry advertising is true if it is

provided by a healthcare practitioner with a good social reputation [8]. Nevertheless, the content of such promotional strategies or advertisements must be accurate and not create unrealistic expectations.

The present study is not without limitations, despite some concrete outcomes. The data offered limits its generalizability due to the low turnout of participants from eastern, northern and southern regions. Furthermore, the data from this study could not be significantly compared with other information, due to limited number of such studies worldwide and in Saudi Arabia. Finally, the satisfaction scale does report what patients actually experience with no cause-effect relationships.

5. CONCLUSIONS

Patient perceptions and motivation for seeking prosthodontic rehabilitation vary based on demographic factors, such as socioeconomic status, knowledge level, gender, and age. A significant number of patients demonstrated a good satisfaction score following prosthodontics treatments. The advertising and influencer marketing strategies had least impact on the Saudi population. Most patients trust their family and friends' advice rather than celebrity or influencer advertisement when seeking prosthodontic care.

References

1. Emami E, de Souza RF, Kabawat M, Feine JS. The impact of edentulism on oral and general health. *Int J Dent*. 2013; 2013:498305.
2. Assery MKA. Knowledge, attitude, and practice regarding prosthodontic rehabilitation and factors affecting the patients visiting private clinics in Riyadh, Saudi Arabia: A cross-sectional study. *J Family Med Prim Care*. 2019;8(10):3362-66.
3. Shrirao ND, Deshmukh SP, Pande NA, Radke UM. An evaluation of patient's decisions regarding dental prosthetic treatment. *J Indian Prosthodont Soc*. 2016;16(4):366-71.
4. Gupta S, Mantri SS, Bhasin A. Knowledge and attitude towards prosthodontic rehabilitation and utilization of dental services by central india population. *Ann Med Health Sci*. 2018; 8:12-5.
5. Bajunaid SO, Alshahrani AS, Aldosari AA, Almojel AN, Alanazi RS, Alsulaim TM, Habib SR. Patients'

- Satisfaction and Oral Health-Related Quality of Life of Edentulous Patients Using Conventional Complete Dentures and Implant-Retained Overdentures in Saudi Arabia. *Int J Environ Res Public Health*. 2022;19(1):557.
6. Abt E, Carr AB, Worthington HV. Interventions for replacing missing teeth: partially absent dentition. *Cochrane Database Syst Rev*. 2012;(2):CD003814.
7. Shetty M, Panchmal G, Shenoy K. Awareness toward replacement of teeth, duration of use, and maintenance of dental prosthesis among adult rural population in Mangalore Taluk. *J Interdiscip Dent*. 2019;9(1):15-8.
8. Graskemper JP. Ethical advertising in dentistry. *J Am Coll Dent*. 2009;76(1):44-9.
9. Solomon M, Radu G, Hostiu C, Margan MM, Bulescu IA, Purcarea VL. Ethical issues in advertising and promotion of medical units. *Rom J Ophthalmol*. 2016;60(4):216-8.
10. Ansari SH, Abdullah Alzahrani AA, Said Abomelha AM, Attia Elhalwagy AE, Mustafa Alalawi TN, Mahmoud Sadiq TW. Influence of Social Media towards the Selection of Hollywood Smile among the University Students in Riyadh City. *J Family Med Prim Care*. 2020; 9(6):3037-41.
11. Dunlop S, Freeman B, Jones S. Marketing to Youth in the Digital Age: The Promotion of Unhealthy Products and Health Promoting Behaviours on Social Media. *Media Commun*. 2016;4(3):35-49.
12. Thomas L, Briggs P, Hart A, Kerrigan F. Understanding social media and identity work in young people transitioning to university. *Comput Hum Behav*. 2017;76:541-53.
13. Akeel R. Attitudes of Saudi male patients toward the replacement of teeth. *J Prosthet Dent*. 2003; 90(6):571-7.
14. Baqar A, Hakeem S, Mohsin A, Mumtaz M, D M. Awareness, attitude and behavior trends in prosthodontic patients seen at Bahria university dental hospital, Karachi an exploratory study. *Pak Oral Dental J*. 2017;37(1):168-72.
15. Nadgere J, Gala-Doshi A, Kishore S. An evaluation of prosthetic status and prosthetic need amongst people living in and around Panvel, Navi-Mumbai-A survey. *Int J Prosthet Dent*. 2010; 1(1):1-6.
16. Parlani S, Tripathi S, Bhoyar A. A cross-sectional study to explore the reasons to visit a quack for prosthodontic solutions. *J Indian Prosthodont Soc*. 2018;18(3):231-8.
17. Raj N, Reddy N, Japatti S, Thomas MS, Uthappa R. Knowledge, Attitudes towards Prosthodontics Rehabilitation and Utilization of Dental Services among Songadh and Amargadh Population. *J Dent Med Med Sci*. 2014;3(1):1-6.
18. Reddy RN, Elamin EI, Vempalli S, Sanabani FA. Perception and Awareness of Prosthodontic Rehabilitation among Jazan Population in the Southern Region of Saudi Arabia. *Glob J Med Res*. 2016;16(1):1-8.
19. Madariaga Muñoz MC, Villegas Estévez F, Jiménez López AJ, Cabezón Álvarez A, Soler López B. Evaluation of Quality of Life and Satisfaction of Patients with Neuropathic Pain and Breakthrough Pain: Economic Impact Based on Quality of Life. *Pain Res Treat*. 2018;2018:5394021. doi: 10.1155/2018/5394021.
20. Shigli K, Hebbal M, Angadi GS. Attitudes towards replacement of teeth among patients at the Institute of Dental Sciences, Belgaum, India. *J Dent Educ*. 2007; 71(11):1467-75.
21. Saleem S. Modified Kuppaswamy scale updated for year 2018. *Indian J Res* 2018;7(3):217-8.
22. Shetty K, Alshaqa E, Koosa A, Jambi S, Jamal N. Trends, Awareness, and Attitudes of Patients Towards Replacement of Missing Teeth in the Western Region of Saudi Arabia. *J Clin Diagn Res*. 2021;15(5):ZC21 - ZC6.
23. Suresh S, Sharma S. A clinical survey to determine the awareness and preference of needs of a complete denture among complete edentulous patients. *J Int Oral Health*. 2010; 2(3):65-70.
24. Marcus PA, Joshi A, Jones JA, Morgano SM. Complete edentulism and denture use for elders in New England. *J Prosthet Dent*. 1996;76(3):260-6.
25. Kalk W, Käyser AF, Witter DJ. Needs for tooth replacement. *Int dent J*. 1993; 43(1):41-9.
26. Vieira AH, E Silva DC, Nogueira TE, Leles CR. Exploring motivations to seek and undergo prosthodontic care: a cross-sectional study in a Brazilian adult sample. *Patient Prefer Adherence*. 2015; 9:803-9.