

Patient Satisfaction with Orthodontic Treatment Received in Public and Private Hospitals in Dammam, Saudi Arabia

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Abstract

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BACKGROUND: The demand for orthodontic treatment is on the rise, and there are high patient expectations for improved dentofacial appearance. Patient satisfaction with orthodontic treatment is associated with improving treatment outcomes.

OBJECTIVE: To evaluate patient satisfaction with orthodontic treatment received in public and private hospitals.

MATERIAL AND METHODS: This cross-sectional study was conducted on a calculated sample of patients who received orthodontic treatment in public and private hospitals in Dammam, Saudi Arabia. A validated questionnaire (five-point Likert scale) was used to assess patient satisfaction with orthodontic treatment.

RESULTS: A total of 229 out of 243 patients completed the survey (response rate = 94.2%). The mean age of the participants was 22.69 ± 6.34 years. More females (65.5%) than males (34.5%) participated in the study. The participants gave the highest satisfaction score to the doctor-patient relationship (mean score 4.33). This was followed by dentofacial improvement (mean score 4.23), dental functions (mean score 4.20), and psychosocial improvement (mean score 3.94). The participants provided significantly more positive perspective about doctor-patient relationship in public than private hospitals (P = 0.014). The patients treated in private hospitals were more satisfied with dental functions domain than those who received treatment in public hospitals (P = 0.023). The patients treated by public orthodontists were significantly more satisfied with other domains (situational aspect and residual category) than by the private orthodontists.

CONCLUSION: The doctor-patient relationship was the most important factor in satisfaction with orthodontic treatment. Overall, patients treated in public hospitals were more satisfied with orthodontic treatment than those in private hospitals.

Introduction

Malocclusion is the third most common oral condition, and it negatively impacts individuals' social interaction and their emotional status in addition to affecting dental functions and facial appearance [1] [2] [3]. Research shows high orthodontic treatment needs among adolescents [4]. The evidence is mounting about the impact of orthodontic treatment on the quality of life of individuals, and improvement in appearance, speech, self-esteem, socialising and interpersonal relationships are seen in orthodontically treated patients [5] [6] [7]. High income and education, and awareness about oral health including improved

facial esthetics have resulted in an increased demand for orthodontic treatment [8]. A vast majority (69.6%) of teenagers wants orthodontic treatment, and their desire is associated with the severity and different types of malocclusion [9]. Female tend to perceive a greater need for orthodontic treatment than male adolescents [10] [11]. Each year, about 5.75 million Americans and Canadians seek orthodontic treatment, and there was 43.75% increase during the last decade [12].

Many factors such as interpersonal relations between provider and patients, accessibility and convenience of care, quality of services, the competence of provider, and the cost of treatment

determine patient's satisfaction. Patient satisfaction surveys can bring new information about the realities of care provided to them that may not mirror the perceptions of health care providers [13]. Hence, several studies employed different instruments and showed a wide range of patient satisfaction with orthodontic treatment [14] [15] [16] [17].

Satisfaction of patients with orthodontic treatment is associated with gender, age, duration of orthodontic treatment, and an improvement in dentofacial appearance. Also, patient satisfaction is considered crucial for adherence to orthodontic treatment and is related to the stability of orthodontic treatment [18] [19]. The quality of health services provided to patients also affects their satisfaction [20]. On the contrary, Al-Omiri and Abu Alhaja reported no relationship between patient satisfaction and age and gender [14]. A previous study in Saudi Arabia reported that 87.1% of patients were satisfied with orthodontic treatment [21].

Presently, there is an increased demand for orthodontic treatment in addition to high expectations for improved dentofacial appearance. Providing high standards of orthodontic treatment and achieving the highest satisfaction level should be a top priority of practising dentists as these elements are critical to retaining the patients. Most studies reported in the literature involved orthodontic patients visiting teaching dental hospitals/ centres in universities. The level of patient satisfaction with orthodontic treatment could be different if treated in private dental practices or government hospitals/dental centres.

Therefore, this study was conducted to compare the level of patient satisfaction with orthodontic treatment received in private and public hospitals in the Eastern Province of Saudi Arabia. The study was expected to provide valuable information that could be used to achieve the highest level of patient satisfaction with orthodontic treatment and consequently improved treatment outcomes in both the public and private sectors in the country.

Methods

This cross-sectional study was conducted from January 16, 2017, to April 25, 2017, at public and private orthodontic speciality centres or hospitals in Dammam, Dhahran, AlKhobar the Eastern Province of Saudi Arabia. The ethical approval was obtained from the Scientific Research Unit of the College of Dentistry Imam Abdulrahman Bin Faisal University, Dammam (ethical approval #2017008). The researchers contacted the administrators of the speciality centres and hospitals to get their permission to conduct a survey. An estimated sample of 243 patients was calculated based on a 5% margin of error, 95%

confidence interval, 80% of response distribution and population size (20,000) [22]. The patients who received orthodontic treatment over one year were eligible to participate in this study. The participants were briefed about the purpose and details of the study. They provide their consent by filling out the questionnaire. The questionnaire was delivered to every patient up to the first 243 patients. The study was conducted in line with the principles of the Helsinki Declaration.

The patients with cleft lip and cleft palate were excluded from the study. A validated questionnaire (five-point Likert scale) was used to assess patient's satisfaction with orthodontic care [15]. However, content and face validation of the questionnaire was conducted by the expert faculty members ensuring readability, comprehensiveness, and clarity of the items in the final questionnaire. This is pivotal because when adapting a questionnaire to a new setting, some of the items may not be conceptually relevant to Saudi culture and ways of life. Moreover, some of the items may not be relevant to certain age groups in the current study. Therefore, some of the items in the original questionnaire were removed. The questionnaire was translated into Arabic and reviewed by a faculty member who was an expert in both English and Arabic languages before it was administered to patients. The questionnaire items are distributed in seven sections which include personal data, the doctor-patient relationship, situational aspects, dento-facial improvement, psychosocial improvement, dental function, and residual category.

The collected data were entered and analysed using SPSS program version 22 (IBM Corp. Armonk, NY, USA). Means and standard deviations were calculated for quantitative variables and frequency distribution for categorical variables. Mean scores of each subscale of the questionnaire were calculated. Mann Whitney U test was used to evaluate the differences in satisfaction levels between the patients treated in private and public hospitals. A p-value ≤ 0.05 was considered significant.

Results

A total of 229 out of 243 patients completed the survey with a response rate of 94.2%. The mean age of the participants was 22.69 ± 6.34 years. Approximately 67.7% (n = 150) of the patients were treated at governmental hospitals and 32.3% (n = 79) at private hospitals. More females (65.5%) than males (34.5%) participated in the study. About 39.3% had insurance coverage, and almost half the sample had a monthly family income of more than 10,000 SAR (1\$ U.S. = 3.75 SAR). Minimum duration of orthodontic treatment was one year, and the mean duration was 2.21 years (Table 1).

Table 1: Demographic information of study participants

Characteristics	N	%
Gender		
Male	79	34.5
Female	150	65.5
Nationality		
Saudi	195	85.2
Non-Saudi	34	14.8
Education		
No formal education	4	1.7
Primary education	15	6.6
Secondary education	109	47.6
Bachelor's degree	94	41.0
Master's degree and above	7	3.1
Monthly household income		
Less than SAR 10,000 per month	63	27.5
Between SAR 10,000 to 20,000 per month	69	30.1
More than SAR 20,000 per month	28	12.2
Do not know/not sure	69	30.1
Dental insurance		
Yes	90	39.3
No	139	60.7
Type of hospital		
Public	155	67.7
Private	74	32.3
Age of participants (Mean \pm SD)	22.69 \pm 6.34 years	
Duration of treatment (Mean \pm SD)	2.21 \pm 1.21 years	

The comparison of patients' responses to satisfaction regarding orthodontic treatment received in public and private hospitals was carried out. There are six domains in the questionnaire which are displayed in the tables. In the doctor-patient relationship domain, patients gave the highest mean scores to respectfully receiving treatment (mean score 4.63) and liking the orthodontist (mean score 4.62).

Table 2: Patient satisfaction with orthodontic treatment related to the doctor-patient relationship in public and private hospitals

Doctor-patient relationship	Mean score \pm SD	Public hospital	Private hospital	P-value
		Mean \pm SD	Mean \pm SD	
I personally liked the orthodontist(s) who treated me	4.62 \pm 0.60	4.68 \pm 0.555	4.50 \pm 0.687	0.045
Greater efforts should have been made to reduce the pain from braces	3.51 \pm 1.31	3.63 \pm 1.269	3.24 \pm 1.353	0.038
The orthodontist(s) always checked their work carefully	4.51 \pm .75	4.54 \pm 0.714	4.46 \pm 0.831	0.667
The orthodontic care I received could have been better	3.56 \pm 1.35	3.66 \pm 1.340	3.35 \pm 1.359	0.093
The orthodontist(s) was gentle when treating me	4.52 \pm 0.72	4.63 \pm 0.583	4.30 \pm 0.918	0.008
Before treatment began, my orthodontist(s) carefully explained what treatment would be like	4.41 \pm 0.82	4.55 \pm 0.616	4.12 \pm 1.097	0.007
Questions I had about my treatment were answered promptly	4.52 \pm 0.68	4.60 \pm 0.609	4.34 \pm 0.799	0.013
The assistants were gentle when treating me	4.56 \pm 0.62	4.61 \pm 0.574	4.46 \pm 0.70	0.120
The orthodontic staff (assistants and office personnel) treated me with respect	4.53 \pm 0.64	4.59 \pm 0.556	4.42 \pm 0.776	0.190
The orthodontist(s) treated me with respect	4.63 \pm 0.58	4.66 \pm 0.562	4.55 \pm 0.622	0.183
Overall mean score	4.33 \pm 0.13	Mean Ranks 124.59	Mean Ranks 94.92	0.014

Patients treated in public hospitals liked orthodontist more than in private hospitals, and the difference was statistically significant ($P = 0.045$). Similarly, public orthodontists more carefully explained the treatment ($P = 0.007$) and promptly answered patients' questions (P -value = 0.013) and gently provided treatment ($P = 0.008$) than private orthodontists. Overall, there was the more positive perspective of the patients about the doctor-patient relationship in public than private hospitals ($P = 0.014$) (Table 2).

Table 3 shows that the respondents identified cleanliness of treatment areas (mean score 4.47) as the most important item in addition to the timing (mean score 4.33) and appropriateness (mean score 4.31) of appointments in the situational aspects domain. Most items did not differ statistically in both public and private hospitals, however, more satisfaction reported in public than in private hospitals (P -value = 0.025).

Table 3: Patient satisfaction with orthodontic treatment related to situational aspects in public and private hospitals

Situational aspects	Mean score \pm SD	Public hospital	Private hospital	P-value
		Mean \pm SD	Mean \pm SD	
My treatment took about as long as I expected it would	3.83 \pm 1.001	3.92 \pm 0.897	3.65 \pm 1.175	0.160
Even though some appointments were short, each was necessary for my treatment to be successful	4.31 \pm 0.768	4.29 \pm 0.747	4.34 \pm 0.816	0.457
Problems that arose during treatment were quickly taken care of	4.24 \pm 0.853	4.22 \pm 0.832	4.28 \pm 0.899	0.346
The treatment area was modern and up to date	4.30 \pm 0.777	4.34 \pm 0.716	4.20 \pm 0.891	0.428
The orthodontist's office was conveniently located	4.25 \pm 0.793	4.28 \pm 0.761	4.20 \pm 0.860	0.645
I was satisfied with the selection of days and times when I could be seen for orthodontic appointments	4.33 \pm 0.751	4.39 \pm 0.649	4.20 \pm 0.921	0.326
Plenty of time was spent with me during each appointment	3.37 \pm 1.238	3.31 \pm 1.241	3.49 \pm 1.230	0.310
I was rarely kept waiting for appointments	3.73 \pm 1.167	3.85 \pm 1.068	3.49 \pm 1.327	0.072
The waiting area was comfortable	4.24 \pm .820	4.30 \pm 0.751	4.09 \pm 0.939	0.152
The treatment area was clean and sanitary	4.47 \pm 0.716	4.44 \pm 0.739	4.53 \pm 0.667	0.426
I had to travel far to reach the orthodontic clinic	2.89 \pm 1.478	3.01 \pm 1.481	2.64 \pm 1.448	0.078
The treatment took much too long	3.45 \pm 1.247	3.37 \pm 1.274	3.61 \pm 1.180	0.194
Overall mean score	3.86 \pm 0.129	Mean Ranks 121.78	Mean Ranks 100.80	0.025

The study participants expressed their satisfaction with different items of dentofacial improvement. But no statistically significant differences were reported by patients treated in public and private hospitals (Table 4).

Table 4: Patient satisfaction with orthodontic treatment related to dentofacial improvement in public and private hospitals

Dentofacial improvement	Mean score \pm SD	Public hospital	Private hospital	P-value
		Mean \pm SD	Mean \pm SD	
My teeth are straighter due to orthodontic treatment	4.23 \pm 0.812	4.22 \pm 0.847	4.24 \pm 0.737	0.920
I have a better bite due to orthodontic treatment	4.23 \pm 0.822	4.23 \pm 0.820	4.22 \pm 0.832	0.917
I think I have a more attractive face due to orthodontic treatment	4.18 \pm 0.873	4.20 \pm 0.871	4.14 \pm 0.881	0.578
My appearance has changed exactly as I expected	4.21 \pm 0.827	4.25 \pm 0.784	4.14 \pm 0.911	0.531
My teeth fit very well since I have been treated	4.24 \pm 0.762	4.21 \pm 0.787	4.32 \pm 0.704	0.347
When I look in the mirror, I feel very satisfied with the way my appearance is improved since orthodontic treatment	4.25 \pm 0.797	4.24 \pm 0.765	4.27 \pm 0.865	0.510
I feel very happy because I look so much better since I have been treated	4.33 \pm 0.740	4.33 \pm 0.713	4.34 \pm 0.799	0.720
Overall mean score	4.23 \pm 0.016	Mean Ranks 113.57	Mean Ranks 118.00	0.633

The patients reported psychosocial improvement with orthodontic treatment (3.94 \pm 0.076). However, no significant differences found in

satisfaction between privately and publically treated patients (Table 5).

Table 5: Patient satisfaction with orthodontic treatment related to psychosocial improvement in public and private hospitals

Psychosocial improvement	Mean score ± SD	Public hospital	Private hospital	p-value
		Mean ± SD	Mean ± SD	
I feel better about myself because of orthodontic treatment	4.42 ± 0.694	4.39 ± 0.698	4.49 ± 0.687	0.323
I feel more outgoing because of orthodontic treatment	3.83 ± 1.109	3.85 ± 1.052	3.80 ± 1.227	0.939
I feel more confident because of orthodontic treatment	4.04 ± 0.970	4.06 ± 0.884	4.00 ± 1.135	0.758
I feel more popular because of orthodontic treatment	3.76 ± 1.093	3.72 ± 1.042	3.82 ± 1.198	0.298
When I meet people for the first time, they react much more positively to me since I have been treated	3.87 ± 1.060	3.85 ± 0.988	3.92 ± 1.202	0.254
Overall mean score	3.94 ± 0.076	Mean Ranks 112.24	Mean Ranks 120.78	0.360

As it can be seen in Table 6, the respondents found ease in eating (4.21), chewing (4.17) and biting food (4.18) after having orthodontic treatment. Patients treated in private hospitals were more satisfied with dental functions than those who received treatment in the public hospitals (p-value=0.023). They were satisfied with the results of orthodontic treatment (mean score 4.27) and expressed their desire to recommend treatment (mean score 4.34) to other patients as well. Overall, with regards to the residual category, patients treated with public orthodontists were more satisfied than with private orthodontists (Table 6). The highest overall mean score (4.33) was reported for the doctor-patient relationship domain whereas the lowest mean score 3.67 was given to residual category domain.

Table 6: Patient satisfaction with orthodontic treatment related to dental function and residual category in public and private hospitals

Dental function	Mean score ±SD	Public hospital	Private hospital	p- value
		Mean ±SD	Mean±SD	
Eating is easier since I have been treated	4.21 ± 0.898	4.13 ± 0.881	4.38 ± 0.917	0.013
Chewing is easier since I have been treated	4.17 ± 0.904	4.09 ± .863	4.34 ± 0.969	0.008
I can bite food more easily since I have been treated	4.18 ± 0.879	4.13 ± 0.843	4.30 ± 0.947	0.050
I would recommend orthodontic treatment to everyone who has difficulties chewing food	4.25 ± 0.850	4.17 ± 0.831	4.41 ± 0.875	0.014
Overall mean score	4.20 ± 0.018	Mean Ranks 108.36	Mean Ranks 128.91	0.023
Residual category				
My orthodontic treatment was inconvenient for me	3.26 ± 1.386	3.46 ± 1.411	2.85 ± 1.246	0.002
I take better care of my teeth since having braces	4.29 ± 0.771	4.37 ± 0.740	4.12 ± 0.810	0.019
I am satisfied with the results of my orthodontic treatment	4.27 ± 0.776	4.30 ± 0.791	4.22 ± 0.745	0.332
If I had it to do over again, I would still want orthodontic treatment	3.90 ± 1.054	3.97 ± 1.053	3.74 ± 1.048	0.086
I would recommend orthodontic treatment to others	4.34 ± 0.747	4.33 ± 0.731	4.35 ± 0.784	0.670
I am dissatisfied with the treatment result	2.79 ± 1.373	2.88 ± 1.391	2.59 ± 1.323	0.146
Generally speaking, I have bad experiences with orthodontic treatment	2.90 ± 1.334	2.96 ± 1.353	2.76 ± 1.291	0.285
Overall mean score	3.67 ± .177	Mean Ranks 122.54	Mean Ranks 99.20	0.012

Discussion

The study evaluated patient satisfaction with orthodontic treatment and revealed that patients were more satisfied with the orthodontic treatment received in public than in private hospitals. Overall, a high level of patient satisfaction observed in the present study showed that orthodontic treatment was widely accepted as part of health care services in the province. In addition to the prevalence and severity of malocclusion, the gender is an important variable that determines the utilisation of orthodontic services. More female patients were represented in the sample in our study. This is in agreement with the results of a previous study that showed 54% of female compared with 37% of male patients pursued orthodontic treatment [23]. The high rate of orthodontic treatment among female patients was because females give more importance to physical attractiveness than males and they also consider teeth more important for facial appearance than male patients [23]. It was also found that the need for orthodontic treatment was perceived more significantly in female than male subjects [10]. Nevertheless, a previous study observed no association between gender and patient satisfaction with orthodontic treatment [14].

In the present study, the highest mean score (4.33) was given to doctor-patient relationship, and more patient satisfaction was recorded for public than private orthodontists. In the doctor-patient relationship domain, the patients gave the highest mean score to respectfully receiving treatment (4.63) and liking the orthodontist (4.62). The patients treated in public hospitals liked orthodontist more than in private hospitals (P=0.045). Likewise, most of the patients who participated in this study were satisfied with the explanation regarding treatment procedures and prompt answering of their queries in public than private hospitals (P<0.05). Similarly, a previous study by Shahrani et al. found the majority of patients (87.1%) satisfied with the orthodontic treatment and the dentist-patient relationship was an important factor that affected patient satisfaction [21]. Another study by Keles and Bos also demonstrated similar results and showed that the patients gave the highest satisfaction (mean score 4.24) to doctor-patient relationship domain [19]. The reason of high satisfaction with doctor-patient relationship might be explained by the fact that the treatment will be more effective and patient will be more satisfied when the patient-doctor relationship is good. It has been shown that successful orthodontic treatment is significantly related to the positive doctor-patient relationship [24].

The higher satisfaction observed among patients treated by the public than private orthodontists could be because treatment provided in public settings maintained high ethical and quality standards with evidence-based practice [21]. It is also possible that high patient satisfaction in the public

sector might have resulted because of the recent Saudi government's initiatives to improve the quality of services in the public health sector in the country [25]. Moreover, this was supported by a previous study that observed a significant association between patient satisfaction and the quality of health care services in the public hospitals in Saudi Arabia [26]. On the other hand, lower satisfaction with orthodontic treatment in the private hospitals could be related to poor compliance or unrealistic expectations of the patients in the private sector which could have negatively affected their satisfaction [27].

It was reported that patients were highly satisfied with dental functions particularly with eating and chewing and total satisfaction score was significantly correlated with satisfaction with eating and chewing and oral comfort domains [14]. These findings coincide with the results of the present study where patients reported improvement in biting, chewing and eating after orthodontic treatment. Interestingly, patients treated in public hospitals were less satisfied with the dental function category than those who received orthodontic care in private dental centres ($P < 0.05$). Satisfaction with the aspects of dental function in private sector could be explained by the fact that healthcare providers in private sectors are more likely to provide a better quality of services due to the competitive environment in the market [28].

In the present study, the patients expressed significantly higher satisfaction with the domains which are related to doctor-patient relationship, appointment systems, and equipment and facilities in a dental office and public hospitals were better than private hospitals in these areas. The studies have shown that difficulty in getting dental appointment including long wait time resulted in patient dissatisfaction [29][30]. Similarly, it was found that patients showed high satisfaction with facilities, latest equipment, and the cleanliness of waiting area and instruments [29].

The study findings can help identify the drivers of patient satisfaction with orthodontic treatment both in private and public hospitals in the Eastern province of Saudi Arabia. The use of a validated questionnaire and face and content validation relevant to culture and age of the participants add strength to the study. However, the study participants conveniently participated in the study which limits the generalizability of its findings to most patient populations in the province. Also, there is a possibility of under and overreporting of patients' responses due to social desirability bias. Nevertheless, the findings of the study can help general dental practitioners and other health care providers to refer the patients for orthodontic treatment. Similarly, the decision-makers in the Ministry of Health can develop policies and programs to improve the quality of services provided in both the private and public sectors.

In conclusion, it was found that patients treated in public hospitals were more satisfied with orthodontic treatment than those in private clinics. There were significant differences in patients' responses about the doctor-patient relationship and dental function domains. The doctor-patient relationship was the most crucial factor in the satisfaction of patients with orthodontic treatment. The orthodontists working in the private sector should improve orthodontic services to ensure the highest patient satisfaction. The Ministry of Health should better monitor the quality of orthodontic services and take appropriate measures so that patients receive the highest standards of orthodontic care in both the private and public sectors. The orthodontists should consider establishing a professional relationship with the patients to achieve the highest level of patient satisfaction and improved orthodontic treatment outcomes.

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