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Evaluation of Patient Satisfaction with Orthodontic Care Provision (A Prospective Clinical Study)

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ABSTRACT

Objective: Patient satisfaction is critical to ensure patient adherence during orthodontic treatment. This study evaluated the factors affecting patient satisfaction with orthodontic care and related services provided at different points in the treatment process. Materials and Methods: A prospective questionnaire-based survey was conducted to assess patient satisfaction by using a three-point response rating. The questionnaire contained seven sections divided into 21 questions covering the overall patient relationship with the orthodontic staff, proposed treatment explanation, treatment environment, and quality. A total of 156 Iraqi patients receiving various orthodontic treatment at the College of Dentistry, University of Baghdad, were recruited for this study. The participants were distributed into two main groups based on either patients' age: adolescents (under 18 years old) and adults (18 years or older) or patients' gender: male and female. Only 147 patients (66 Adolescents and 81 adults; 43 males and 104 females) completed the questionnaires.

Results: The validated questionnaire successfully assessed patient satisfaction, showing different percentages of responses addressing various questions. The highest satisfaction "always" response percentages (up to 98.8%) were found in the orthodontist–patient relation section, whereas the highest dissatisfaction "never" responses (up to 16%) and "sometimes" answers (up to 60.6%) were observed in the patient waiting time section. When patients' responses were compared, Chi-square analysis showed a non-significant correlation ($p>0.05$) between age or gender groups except for the question "*I see my orthodontist each time I come*" between male and female groups.

Conclusions: The first Arabic version of a patient satisfaction questionnaire was successfully developed and validated. Although age and gender did not significantly impact satisfaction, orthodontist–patient relations (especially verbal communication) and quality of care were key determinants in promoting patient satisfaction. whereas disregarding waiting time and waiting room environment may adversely affect the satisfaction level.

Keywords: Health Services, Orthodontics, Patient Satisfaction, Patient Adherence, Questionnaires

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Introduction

Achieving patient satisfaction has become a major concern in recent years for all healthcare suppliers. Patient compliance and the ability to communicate are connected to patient satisfaction, and they play a crucial role in yielding high-quality clinical outcomes.[1,2] Satisfaction with receiving healthcare services has been recognized as a measure of quality, which is consistent with the National Health Service (NHS) Management Inquiry[3] publication in the early eighties that emphasized the value of user opinion. This phenomenon has been attributed to the growing demand for increased consumer involvement in healthcare and the strong correlation between satisfaction and patient compliance. These factors have a remarkable influence on various aspects of healthcare, such as appointment attendance, commitment to recommended treatment, and medication use.[4] In addition, patient involvement within the context of health services would offer them to share responsibility with the clinician's professional performance in care quality improvement and organizational learning and development.[5]

In the same regard, patient satisfaction has been found to play a substantial role in patient adherence to orthodontic treatment.[2] The unique merit of repetitive and long-term appointments during orthodontic treatment can foster strong orthodontist–patient relationships, which can increase the influence of patient compliance in successful outcomes.[6] In the literature, different levels of overall patient satisfaction with orthodontic treatment have been reported, ranging between 34% and 95%.[7–11] The trend of quality improvement is oriented toward user-friendly, quick, and simple systems for generating information about professional performance and patient satisfaction. Using

a feasible, non-complicated method/instrument with a valid, reliable questionnaire to assess patient satisfaction with orthodontic treatment is recommended and has been a common practice in orthodontics.[6,11,12] However, the instrument must be validated to operate well within the target population.[13,14] Moreover, adults show an increasing utilization of orthodontic care services; their needs vary from those of children and adolescent patients in terms of psychological experience[8,10], which may affect their level of satisfaction. Furthermore, two systematic reviews evaluating patient satisfaction with orthodontic treatment reported a limited level of evidence underscoring the necessity for further high-quality studies in this field.[15,16]

Educational oral health institutes across the world constitute a substantial part of the healthcare process. They comprise large numbers of teaching institutions and dental institute clinics of under- and post-graduate levels, and ongoing endeavors are required to improve the quality of care and level of education to their patients and students, respectively. At Baghdad College of Dentistry in Iraq, enormous efforts and funds have been allocated to improve quality and increase knowledge standards, yet information about patient satisfaction is limited. Therefore, this study aimed to assess patient satisfaction with orthodontic care provided in orthodontic department clinics at Baghdad College of Dentistry as a part of the continuous quality improvement program. The null hypothesis of this study was that there would be no difference in the satisfaction level of orthodontic patients with orthodontic care provision based on their age or gender.

Materials and Methods

Ethical approval was approved by the Ethics Committee at the College of Dentistry/ University of Baghdad (Ref. number: 367). A questionnaire-based prospective study to assess patient satisfaction was conducted from April 2023 to July 2023 at the orthodontic department clinics/ Baghdad College of Dentistry. Inclusion criteria were patients who had commenced active fixed appliance treatment and given informed consent to be interviewed. Patients with syndromes, cleft lip and palate, or those who needed orthognathic surgery were excluded from the study. The patients were collected at different time points of the orthodontic treatment course, which were primarily treated either by students with master's (MSc) or doctoral (PhD) degrees, both of whom were under faculty academic supervision in specialty training programs. The participants were allocated into two main groups based on either patients' age: adolescents (under 18 years old) and adults (18 years or older) or patients' gender: male and female.

The orthodontic patients were interviewed using a structured questionnaire described by the Royal College of Surgeons of England[17] for patient outcome measures. Processing of the questionnaire passed through four phases. It was first translated to Arabic by the Translators Association to match the native language, enhance patient perception, and improve convenience. This step was followed by three phases of face and content validations. In phase 2, the three authors who can speak Arabic and English fluently checked the translated version of the questionnaire and focused on the contents' language, flow, and completeness. In phase 3, further validation was conducted by five faculty members who are experts in Arabic and English to ensure the translated items' intelligibility, simplicity, and lucidity. In phase 4, the final validation was premised on patients' opinions concerning the understanding and clarity of each item in the questionnaire. The questionnaire was given to patients during their orthodontic treatment course.

The questionnaire contained seven sections, which were divided into 21 questions that covered the overall patient relationship with the orthodontic staff, proposed treatment explanation, treatment environment, and quality. A three-point response rating format was utilized, and the responses were scored as follows: never, sometimes, or always. Additional information involved patient age, gender, ideas, comments, or any additional suggestions for further exploration of underlying factors affecting patient satisfaction. An Excel software spreadsheet was used for data analysis and presentation. After reviewing previous comparable studies, this prospective clinical study was carried out with a patient satisfaction standard of 90%.[9,17]

Statistical analysis: The collected data were managed statistically using statistical package of social sciences software (SPSS, version 24). The statistical analyses involved descriptive statistics, including frequency and percentage values of patient satisfaction scores within age and gender distribution, and Inferential statistics, including Chi-Square statistics for testing patient satisfaction differences within age and gender distribution. For the statistical evaluation, differences were considered significant at $p < 0.05$. The sample size was planned to include over 100 participants, which is considered adequate in studies designed for patient-reported outcome measurement instruments.[18] Detailed information on the sample size of the cross-sectional convenience sample in the questionnaire studies can be found in the COSMIN user manual (https://www.cosmin.nl/wp-content/uploads/COSMIN-manual-V2_7_4_final.pdf).

Results

During face validation (phases 2 and 3), the authors and the five faculty members revised and modified some words that were considered ambiguous and replaced them with appropriate terms. By the end of the third phase, there was 100% consensus among all the authors and faculty members that the Arabic version was appropriate and delivered clear, consistent, and comprehensive content as the original questionnaire. Linguistic validation was further approved by patients'

confirmation (phase 4) of the questionnaire clarity and understanding.

Out of 170 patients, only 156 agreed to participate in the study; however, nine patients failed to complete all the questionnaire items; therefore, only 147 patients were included in the study (66 Adolescents and 81 adults; 43 males and 104 females). Figure 1 and Figure 2 display different percentages of the three-score rating format that were reported by age and gender groups, depicting various levels of patient satisfaction premised on the responses to the 21 questions.

Table 1 and Table 2 demonstrate the percentages of responses from both age and gender groups, respectively, to nine items about the orthodontist–patient relationship and technical quality of care, which reflect patient satisfaction concerning the overall patient relationship with the orthodontic staff. Among responses of age groups, the satisfaction gold standard was reached only in three items: *"my orthodontist treats me with respect*," *"I have confidence in my orthodontist*," and *"My orthodontist is caring*," in which the satisfaction response percentages were substantially "always". The responses in the gender groups presented the same satisfaction trends in the first two questions, while the third item that reached the gold standard was seen in *"My orthodontist is friendly"*. However, there was no statistically significant difference between the adults and adolescents or between the males and females in response to any item in this section.

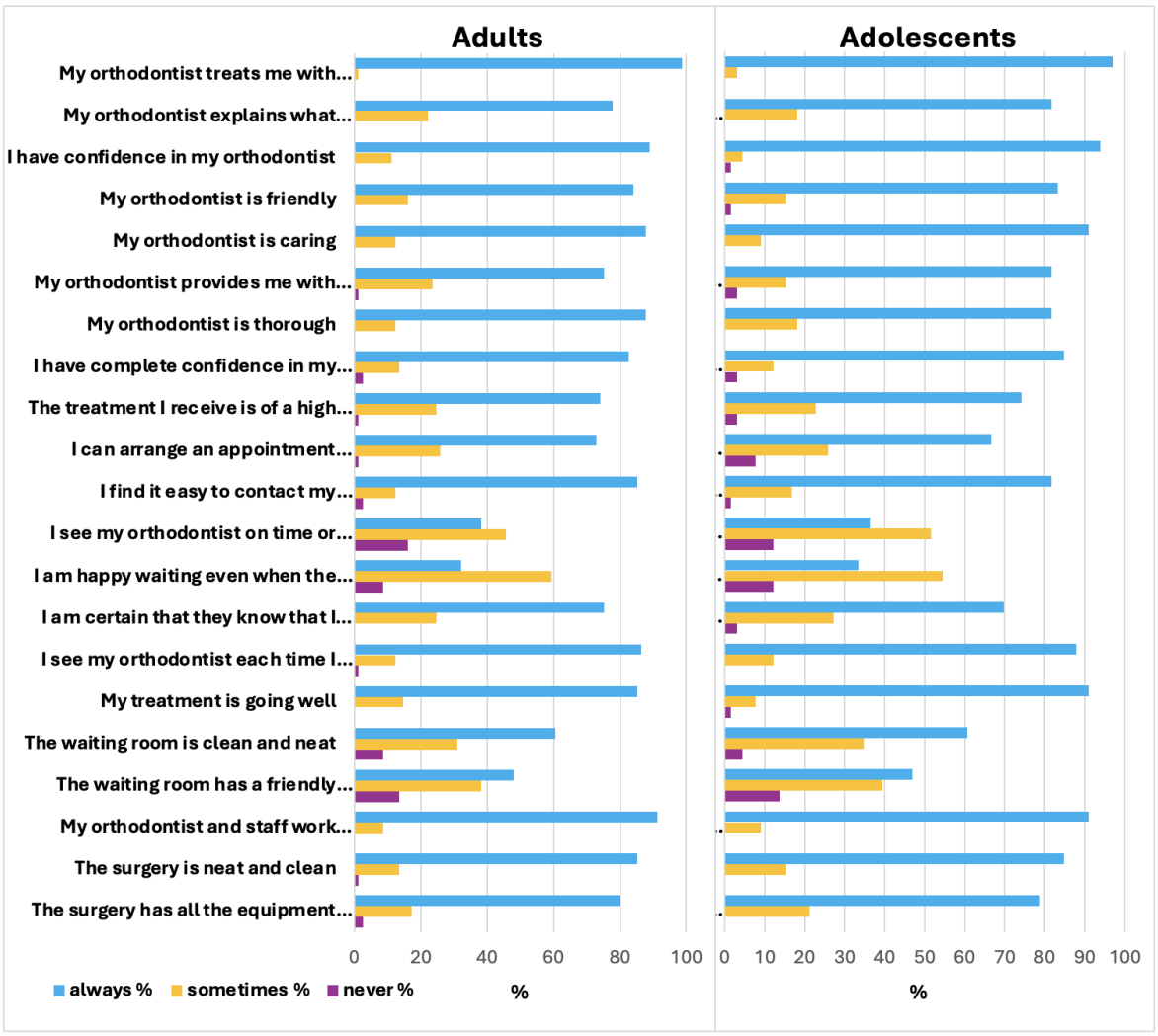

Figure 1: Percentages of the responses from the two age groups to patient satisfaction questionnaire items.

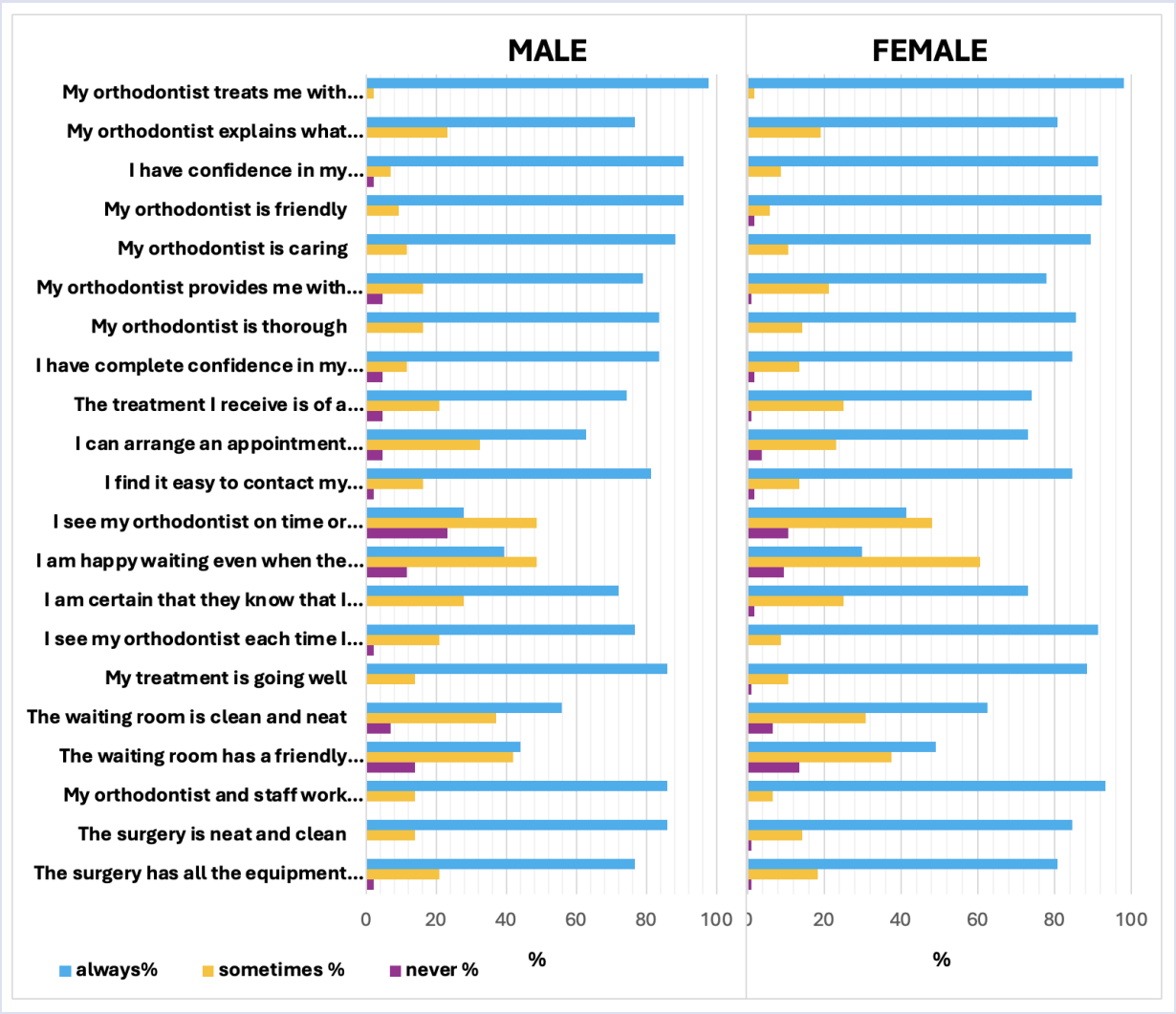

Figure 2: Percentages of the responses from the two gender groups to patient satisfaction questionnaire items.

Table 1: Percentages and comparisons of the responses from the two age groups to questionnaire items addressing orthodontist-patient relationship and technical quality of care.

	Questionnaire Items	Adolescents (n=66)			Adults (n=81)			chi-square
		always%	sometimes %	never %	always %	sometimes %	never %	p-value
Orthodontist-Patient Relationship	My orthodontist treats me with respect	97.0	3.0	0.0	98.8	1.2	0.0	0.745
	My orthodontist explains what he/she is going to do	81.8	18.2	0.0	77.8	22.2	0.0	0.830
	I have confidence in my orthodontist	93.9	4.5	1.5	88.9	11.1	0.0	0.197
	My orthodontist is friendly	83.3	15.2	1.5	84.0	16.0	0.0	0.994
	My orthodontist is caring	90.9	9.1	0.0	87.7	12.3	0.0	0.819
	My orthodontist provides me with the information I need	81.8	15.2	3.0	75.3	23.5	1.2	0.360
Technical Quality of Care	My orthodontist is thorough	81.8	18.2	0.0	87.7	12.3	0.0	0.614
	I have complete confidence in my orthodontist	84.8	12.1	3.0	82.7	13.6	2.5	0.940
	The treatment I receive is of a high standard	74.2	22.7	3.0	74.1	24.7	1.2	0.728

Table 2: Percentages and comparisons of the responses from the two gender groups to questionnaire items addressing orthodontist-patient relationship and technical quality of care in gender groups.

	Questionnaire Items	Male (n=43)			Female (n=104)			chi-square
		always%	sometimes %	never %	always %	sometimes %	never %	p-value
Orthodontist-Patient Relationship	My orthodontist treats me with respect	97.7	2.3	0.0	98.1	1.9	0.0	0.875
	My orthodontist explains what he/she is going to do	76.7	23.3	0.0	80.8	19.2	0.0	0.582
	I have confidence in my orthodontist	90.7	7.0	2.3	91.3	8.7	0.0	0.283
	My orthodontist is friendly	90.7	9.3	0.0	92.3	5.8	1.9	0.498
	My orthodontist is caring	88.4	11.6	0.0	89.4	10.6	0.0	0.852
	My orthodontist provides me with the information I need	79.1	16.3	4.7	77.9	21.2	1.0	0.301
Technical Quality of Care	My orthodontist is thorough	83.7	16.3	0.0	85.6	14.4	0.0	0.774
	I have complete confidence in my orthodontist	83.7	11.6	4.7	84.6	13.5	1.9	0.633
	The treatment I receive is of a high standard	74.4	20.9	4.7	74.0	25.0	1.0	0.326

Table 3: Percentages and comparisons of the responses from the two age groups to questionnaire items addressing access, patient waiting time, and continuity sections.

	Questionnaire Items	Adolescents (n=66)			Adults (n=81)			chi-square
		always%	sometimes %	never %	always %	sometimes %	never %	p-value
Access	I can arrange an appointment when it suits me	66.7	25.8	7.6	72.8	25.9	1.2	0.150
	I find it easy to contact my orthodontist to make an appointment	81.8	16.7	1.5	85.2	12.3	2.5	0.710
Patient Waiting Time	I see my orthodontist on time or within 10 minutes	36.4	51.5	12.1	38.3	45.7	16.0	0.710
	I am happy waiting even when the clinic is running late	33.3	54.5	12.1	32.1	59.3	8.6	0.744
Continuity	I am certain that they know that I have arrived	69.7	27.3	3.0	75.3	24.7	0.0	0.258
	I see my orthodontist each time I come	87.9	12.1	0.0	86.4	12.3	1.2	0.660
	My treatment is going well	90.9	7.6	1.5	85.2	14.8	0.0	0.220

Table 4: Percentages and comparisons of the responses from the two gender groups to questionnaire items addressing access, patient waiting time, and continuity sections.

	Questionnaire Items	Male (n=43)			Female (n=104)			chi-square
		always%	sometimes %	never %	always %	sometimes %	never %	p-value
Access	I can arrange an appointment when it suits me	62.8	32.6	4.7	73.1	23.1	3.8	0.457
	I find it easy to contact my orthodontist to make an appointment	81.4	16.3	2.3	84.6	13.5	1.9	0.891
Patient Waiting Time	I see my orthodontist on time or within 10 minutes	27.9	48.8	23.3	41.3	48.1	10.6	0.086
	I am happy waiting even when the clinic is running late	39.5	48.8	11.6	29.8	60.6	9.6	0.420
	I am certain that they know that I have arrived	72.1	27.9	0.0	73.1	25.0	1.90	0.628
Continuity	I see my orthodontist each time I come	76.7	20.9	2.3	91.3	8.7	0.0	0.032*
	My treatment is going well	86.0	14.0	0.0	88.5	10.6	1.0	0.693

The percentages of responses from both ages and genders to seven items covering the access, patient waiting time, and continuity sections, which embody patient satisfaction regarding adequacy and fluency of appointments, are tabulated in Table 3 and Table 4, respectively. Patient satisfaction fluctuated under this area for both age and gender groups, with the highest dissatisfaction percentages observed in "*I see my orthodontist on time or within 10 minutes*". On the other hand, the highest scores can be seen in the items of the continuity section. For the age groups, the satisfaction gold standard was reached only by adolescents' responses to "*my treatment is going well*" item with no significant difference from adults, whereas for the gender groups, the gold standard was reached only in the responses of females *to "I see my orthodontist each time I come" which were statistically significant from males.*

Table 5 and Table 6 display the percentages of responses from both age and gender groups, respectively, to five items related to the facilities and surgery atmosphere sections. The satisfaction level reached 90% only in "*my orthodontist and staff work well together*" in both age and gender groups. The Chi-square comparisons did not show any significant response between the adults and adolescents or between the males and females to any item in this section.

Table 5: Percentages and comparisons of the responses from the two age groups to questionnaire items addressing facilities and surgery atmosphere sections.

	Questionnaire Items	Adolescents (n=66)			Adults (n=81)			*chi-square*
		always %	sometimes %	never %	always %	sometimes %	never %	p-value
Facilities	The waiting room is clean and neat	60.6	34.8	4.5	60.5	30.9	8.6	0.584
	The waiting room has a friendly atmosphere	47.0	39.4	13.6	48.1	38.3	13.6	0.988
	My orthodontist and staff work well together	90.9	9.1	0.0	91.4	8.6	0.0	0.995
Surgery Atmosphere	The surgery is neat and clean	84.8	15.2	0.0	85.2	13.6	1.2	0.644
	The surgery has all the equipment necessary for my treatment	78.8	21.2	0.0	80.2	17.3	2.5	0.380

Table 6: Percentages and comparisons of the responses from the two gender groups to questionnaire items addressing facilities and surgery atmosphere sections.

	Questionnaire Items	Male (n=43)			Female (n=104)			chi-square
		always%	sometimes %	never %	always %	sometimes %	never %	p-value
Facilities	The waiting room is clean and neat	55.8	37.2	7	62.5	30.8	6.7	0.736
	The waiting room has a friendly atmosphere	44.2	41.9	14	49.0	37.5	13.5	0.859
Surgery Atmosphere	My orthodontist and staff work well together	86.0	14.0	0.0	93.3	6.7	0.0	0.161
	The surgery is neat and clean	86.0	14.0	0.0	84.6	14.4	1.0	0.808
	The surgery has all the equipment necessary for my treatment	76.7	20.9	2.3	80.8	18.3	1.0	0.744

Discussion

Orthodontic treatment quality can be affected by the level of patient satisfaction. The available research on patient satisfaction and its effect on improving orthodontic care provision is limited, especially at educational institutes.

The use of questionnaires has been considered a reliable and user-friendly instrument to assess satisfaction, evaluate quality, and improve services provided to patients.[4] Linguistic adaptation and pilot testing are crucial when adapting health assessment instruments for different countries. [19] In accordance with the basic validation phases described in earlier studies,[13,14] linguistic validation of the Arabic version of the questionnaire was performed in this study to overcome the cultural and language background differences. Satisfaction during all treatment stages from the patient's perspective should be recognized and quantified to ensure the best possible treatment outcomes.[4] The findings obtained from this questionnaire-based clinical study provide additional insight into patient satisfaction with orthodontic care.

The patients' responses showed that there was no statistically significant difference in satisfaction levels across different patients' age and gender groups except for the question "*I see my orthodontist each time I come*" between male and female groups. Consequently, the null hypothesis was partially rejected, and the outcomes were primarily discussed according to the percentage of responses. These findings are closely aligned with those of earlier studies, which found that neither age nor gender significantly influences orthodontic patient satisfaction.[16,20] Moreover, these outcomes may be attributed to the similar circumstances in which the present single-center study was performed. Both age or gender groups received orthodontic care under comparable environments, including the physical surgery atmosphere and orthodontic care staff, which might be more closely linked to the level of satisfaction than patients' factors.

The findings concerning patient satisfaction are discussed according to the seven sections of the questionnaire, covering three satisfaction domains:

Overall patient relationship with the orthodontic staff

This domain included *the Orthodontist–Patient Relationship and Technical Quality of Care* sections. Across all groups, the satisfaction gold standard was met in two items: "*My orthodontist treats me with respect" and "I have confidence in my orthodontist".* while the third item that reached the gold standard was seen in *"My orthodontist is caring*" and *"My orthodontist is friendly"* in age and gender groups, respectively. Although the responses to the other items under this area did not reach the gold standard, the scores were considerably "always," reflecting a high satisfaction level in this area.

In the present study, the orthodontist–patient rapport could be considered the core part of the overall patient satisfaction assessment process because this relationship level represents a key factor that may overcome or mask the role of other contributing factors. Thus, this section involved more items than other sections. This finding was in agreement with those of previous studies [2,16,20-22], which reported that an orthodontist's behavior is a crucial factor in patient satisfaction with the treatment process, regardless of a patient's age or gender.

The item "*The treatment I receive is of a high standard*" scored a lower satisfaction level than other items under the same area, denoting the influence of the quality of care, which is closely associated with satisfaction.[15] Similarly, this could highlight the importance of orthodontist qualification and professionalism. These findings were consistent with those of Wong *et al*.,[21] who stated that professionalism is

an influencing factor in patient satisfaction with orthodontic care.

Adequacy and Fluency of Appointments

This domain covers *Access, Patient Waiting Time, and Continuity.* Patient satisfaction did not reach the standard satisfaction level for most of the items. In addition, the "never" score was frequently observed in *Access* and *Patient Waiting Time*, revealing the crucial effect of waiting time on low satisfaction levels [20] and indicating the need to enhance these two sections. This dissatisfaction could be attributed to the burden of patient overload on the fluency and organization of appointments at the educational oral health institutes, indicating a real organizational problem. This issue is a common problem in many oral health institutes around the world,[22] which may influence patient engagement in the oral health care process, especially for a health service that demands long-term patient consistency and adherence such as orthodontic treatment.[23] Many patients at the NHS site described the effect of appointment waiting times on the fluency of their day activities and how they were not always informed how long it would take before surgery admission.[9] In contrast, Wong *et al*. found that waiting time does not affect overall satisfaction with the treatment process considerably.[21] In opposition to all other items, there was a significant impact of gender on the responses to *"I see my orthodontist each time I come"*, which may be related to the high tolerance nature of females.

Clinic and Reception Atmosphere

This area of satisfaction covers items of "*Facilities" and "Surgery Atmosphere*" Patient satisfaction reached the standard level only in the "*My orthodontist and staff work well together*" item, which could be linked to the decisive impact of dentist-staff-patient interactions on satisfaction.[15] In contrast, the scores fluctuated regarding the other items reflecting different degrees of dissatisfaction with no identified pattern. This fluctuation may depict a reflection of poor tolerance standards and improper physical surroundings on patient disengagement and dissatisfaction.

Certain limitations should be considered when assessing the factors affecting patient satisfaction. Collecting a larger sample size over a long period of orthodontic treatment may provide more precise outcomes regarding patient satisfaction. Moreover, the convenient recruitment of the study sample might affect the generalizability of the results. Sample randomization and multi-center recruitment are preferred; however, a multi-center study design entails patient responses in dissimilar environments, which may be a source of bias that might adversely affect the outcomes. Further studies are necessary to examine the effect of multi-center health institutes, patients' education, and socioeconomic levels on their satisfaction with the provided orthodontic care.

Conclusions

This study provided the first Arabic version of a patient satisfaction questionnaire, which can be utilized as a standard method for the objective assessment of patient satisfaction in subsequent studies. An Arabic version of the questionnaire can contribute to patient satisfaction optimization.

Regardless of age and gender, overall satisfaction with the treatment process appeared to be considerably impacted by the quality of care and the orthodontist–patient relationship, especially verbal communication, which is pivotal in promoting patient satisfaction. Clear and regular explanations must be provided to the patients to improve their understanding of the treatment progress. Physical surroundings and waiting time are factors that can reduce patient satisfaction; therefore, efforts to enhance these aspects are recommended.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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