How Do Patients and Parents Decide for Orthodontic Treatment– Effects of Malocclusion, Personal Expectations, Education and Media

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Objectives: *To examine patients' and parents' perceptions and expectations from orthodontic treatment.* ***Study Design:*** *491 patients (274 female, 217 male) aged 14-22 years, and 399 parents (245 female, 154 male) completed a questionnaire about preferences, needs and expectations about orthodontic treatment, and scored the present problem. Continuous variables were compared by Mann-Whitney U and Kruskal-Wallis tests, whereas Chi-square test was used for categorical variables.* ***Results:*** *Patients'(77.1%) and parents'(84.6%), decision about orthodontic treatments were influenced by suggestion of dentists. Patients who decided to attend to clinic by themselves were higher than parents (p=0.006). Dental aesthetics was the determinant factor for treatment demand for patients(61.0%) and parents(57.3%). Improvement in oral functions was more important for Class III patients than Class I patients (p=0.040). Adult patients/parents with higher education gave more importance to oral functions as well as dental aesthetics (p=0.031). There was no difference among Angle classifications regarding orthodontic problem scores. Parents found media sources valuable (p=0.018) but majority expected dentists for information about orthodontic treatments. Education degree of adult patients/parents effected this decision(p=0.002).* ***Conclusions:*** *Desire to have better dental aesthetics was the primary motivating factor for all participants. Clinicians should consider concerns of Class III patients about oral functions during treatment planning.*

Key Words: *malocclusion, questionnaire, orthodontic treatment need, expectation, perception*

INTRODUCTION

Malocclusions might have an adverse effect on patients' quality of life. This may be linked to the increasing demand for orthodontic treatment, which might be attributed to social, cultural, psychological factors, and personal norms.[1-3] Evidence suggests that, attractiveness and increasing self-confidence have been the major motivations behind orthodontic treatment.[4, 5] Gender, age, educational level, severity of malocclusion, self-perception of facial appearance, recommendations from a dentist, and the influence of parents, relatives or friends are also found to be important.[6-8]

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For all these aforementioned reasons, it is essential for an orthodontist to understand the expectations and motivations of not only patients but also people around them, since these factors may affect cooperation to and satisfaction from treatment. Similarly, Proffit and White emphasized the importance of exploring patients' motivation at the beginning of orthodontic treatment.[9] Previous studies assessed the expectations from an orthodontic treatment and reported that improvement in self-image and oral functions are important motivation factors for both parents and patients; self-image being the primary reason.[10-12]

The perception about severity of the present orthodontic problem may also be a factor for individuals to seek orthodontic treatment. Malocclusions in the anterior region awoke children's concerns about dentofacial attractiveness.[13, 14] In particular, Helm [13] stated that overjet, incresed overbite and crowding are related with dissatisfaction with self-appearance. However, perception may not necessarily reflect the actual need for orthodontic treatment. For instance, Soh and Lew[15] reported that children with Class I, open bite, Class III, Class II, anterior crowding and deep bite patients ranked an increasing need for orthodontic treatment.

Self-concept of a person is known to be affected by the reactions of people around them.[10] For this reason, motivation caused by the pressure from close people to the patient such as family members, friends or partners can direct their desire.[16] McKiernan[17], for instance, reported that parental influence of dental esthetics -not necessarily correlated with severity of malocclusion- may be the main

motivating factor for their children to seek orthodontic treatment. Thus, it is important to consider the perceptions, motivations and expectations of both patients and their parents/guardians before a possible orthodontic therapy.

Previous literature addressed the detection of orthodontic problems by dentists or other dental practitioners, and highlighted the influence on referral of patients for orthodontic treatment.[18, 19] Christopherson [20] reported that actual treatment recommendations made by pediatric residents were significantly higher than objective and subjective treatment needs determined by IOTN. However, not only referral of dentists, but also different media sources to achieve or evaluate information about orthodontic treatments are reflecting the current tendency of populations. Henzell et al[21] suggests that a better understanding of the role of social media in motivational factors, expectations and experiences of orthodontic patients could be helpful for improvements in orthodontic practice.

Therefore the aims of this study were as follows: (1) to analyze how patients and their parents were referred for orthodontic treatment and reasons for preferring university clinics, (2) to assess the subjective perception of present problem and expectations from an orthodontic treatment, (3) to evaluate the interactions between educational level, expectations and perception of malocclusion, (4) to see if participants considered media as a reliable source of information and their opinion regarding the way they want to be enlightened about orthodontic treatment. We also aimed to analyze whether Angle classification had an effect on the aforementioned statements or not.

MATERIALS AND METHOD

This questionnaire-based cross-sectional study was carried out in Department of Orthodontics, Gazi University, from January 2013 to April 2013 among patients between 14-22 years of age and parents/legal guardians of patients under 18 years of age, who accompanied their children, during consultation or to apply for treatment. Patients younger than 18 years old answered the questionnaire by a face-to-face interview with the investigator (N.C.B) under the supervision of their parents/guardians. Participants were given an explanation about the aims of the study and if accepted to take part in, each participant signed an informed consent form. All participants were assured that no name would be present on questionnaires and all information belong to them would be kept confidential. No questionnaires were filled in the presence of any condition, which would affect person's ability to cooperate, understand, answer and/or score the questions such as mental problems, suspicious perceptal defect or loss of hearing, and any craniofacial defects. The study was approved by Ethical Committee of Gazi University (77082166-604.01.02/14).

The questionnaire was adapted from a previous study that was found to be valid and reliable after necessary changes were made.[22] The survey contained 6 questions: five of them consisted of multiple choices and one of them required scoring. The subjects could select more than one answer for some of the questions, where indicated. For the score question, participants were asked to score their present orthodontic problem from 1 (least problematic) to 10 (maximal problematic). No modifications in questions or the choices were made for parents and patients. Participants were told not to answer the question if they were not sure about their choice (Table 1). Participants were supervised by two investigators (N.C.B and A.A.B) while they were filling out the forms but no comments on answers were given. The same investigators identified the Angle classification of each patient and recorded it. Other demographic data about all patients and who accompanied the patient under 18 years of age (mother, father, or other relative), guardian's or adult patients' degree of education, age and gender were also collected.

Statistical Analysis

All statistical analysis were performed by using SPSS Software version 15.0 for Windows (Statistical Package for the Social Sciences, SPSS Inc., Chicago, IL, USA). Continuous variables were presented as mean and standard deviation (SD), whereas categorical variables as number of cases and percentages. The Chi-square test was used for categorical variables. Continuous variables compared by Mann-Whitney U test for two independent groups or Kruskal-Wallis test for three and more independent groups. When Kruskal-Wallis test results were significant, Bonferroni adjusted Mann–Whitney U test was used for pairwise comparisons. A two-sided p value < 0.05 was considered significant for all analysis.

RESULTS

A total of 491 patients (274 female, 217 male) and 399 parents or legal guardians (245 female, 154 male) of patients under 18 years of age who accompanied their children agreed to participate in this study. The detailed information about the distribution of parents/guardians considering the orthodontic problem of the patient was given in Table 2.

Assessment of the answers to the questionnaire

Question-1*:* In general, the majority of the parents (84.6%) and patients (77.1%) declared that, they were referred to an orthodontist by a dentist. The rest of them explained that, either themselves or their parents or friends had noticed the problem (parents: 15.4%, patients: 22.9%). A significant difference between parents and patients was found (p=0.006). When the answers were compared in accordance with the Angle classification, no significant difference was detected among malocclusion types both in parents and patients (Table 3).

Question-2*:* When the reason of choosing to attend a university clinic was asked, most participants stated the importance of social security (parents 46.0%, patients: 43.7%) and confidence in academic facilities (parents 38.2%, patients 42.3%), revealing no significant difference. Intragroup comparisons also showed no significant difference among Angle classifications (Table 3).

Question-3*:* Results showing the expectations of parents and patients from a possible orthodontic treatment demonstrated that, the most important issue for the participants was achieving a better alignment of the dentition (parents 57.3%, patients 61.0%). Improvement of facial esthetics (parents 20.1%, patients 19.5%), and oral functions (parents 22.6%, patients 19.5%) were of less importance. Intragroup comparison with respect to Angle classification, showed a statistically significant difference between Class I and Class III patients, declaring the increased demand for improvement in oral functions in Class III patients than Class I patients (p=0.04) (Table 3).

Table 1. The used questionnaire in the study

Malocclusion (will be filled by investigators): Angle Class I Angle Class II, div 1 Angle Class II, div 2 Angle Class III
Age:
Gender:
Who fills the form?: Patient Parent/Guardian (Please specify: Mother Father Other Relative)
What is the your present educational degree: Elementary School / High School / University / Master / PhD
Please answer the following questions.
1. Who referred you/your child to an orthodontist or told you that you/your child need an orthodontic treatment?
a. A dentist advised me to see an orthodontist
b. Myself, my family members, or my friends realized a problem
2. Why did you prefer a university clinic for a possible orthodontic treatment?
a. I/my family had social security/insurance which covers my expanses in universities.
b. Confidence in academic facilities
c. Increased expenses in private orthodontic clinics
d. Other
3. What are your expectations from an orthodontic treatment? (More than one answer may be given)
a. Better alignment of my/my child's teeth
b. Improvement of my/my child's facial esthetics
c. Achieve better oral functioning such as chewing, quality of speech, or orther (Please specify.....)
4. What would be your score about your/your child's orthodontic problem when you concern your/your child's overall health?
Please score from 1 to 10 where 1 is the least and 10 is the most important problem
1 2 3 4 5 6 7 8 9 10
5. Do you think a person can get a valid and detailed information via media (radio, television, internet, magazine, etc.) about orthodontic treatment?
a. Yes
b. No
c. No idea
6. How do you think public should be informed about orthodontic treatments?
a. Dentists should give more detailed information
b. Via internet, radio and/or television programs
c. University hospitals should organize public seminars

Question-4*:* There was no significant difference between patients and parents about mean scores rating their level of concern over existing orthodontic problem, even the Angle classification was considered as a variable ($p>0.05$) (Table 3).

Question-5*:* Most parents (42.6%) and patients (41.9%) believed that valid information could be gained via media sources. The percentage of participants that didn't agree with this (parents 36.3%, patients 31.7%) or have no idea (parents 21.1%, patients 26.4%) was very close to each other. No significant difference was found in intra- and intergroup comparisons (Table 3).

Question-6*:* When the way the public should be informed about orthodontic treatment was asked, 49.6% of parents and 57.6% of patients said that, dentists should provide more information. Parents and patients who believed internet, radio and/or television programmes to be helpful, was 27.3% and 19.6% respectively. While both groups expected dentists to assess more information, responses of parents demonstrated that media sources would also be helpful in disseminating information about orthodontic treatments, which revealed a significant difference between parents and patients ($p=0.018$). These were followed by the indication for the need of public seminars organized by university hospitals (parents 23.1%, patients 22.8%) (Table 3).

Association between answers to questions and demographic characteristics of participants

For this purpose, answers of all parents and only adult patients (over 18) were evaluated to eliminate a possible bias that may result from parent/guardian supervision.

Table 2. Angle Classification of patients and demographic data about participants

	Patients (n:491)		Parents/ Guardians (n: 399)
Gender			
Male	217		154
Female	274		245
Education Degree			
Elementary School	281		192
High School	162		154
University, Master, PhD	48		53
Angle Classification		**Parent/ Guardian**	
Class I			
Male	81	Mother	91
Female	101	Father	44
		Other Relatives	17
Class II, Div 1			
Male	75	Mother	78
Female	101	Father	49
		Other Relatives	12
Class II, Div 2			
Male	12	Mother	18
Female	29	Father	12
		Other Relatives	2
Class III			
Male	49	Mother	41
Female	43	Father	32
		Other Relatives	3

Association between responses of"Question-3" and educational degree: In general, regardless of Angle classification, better alignment of teeth was the major expectation from an orthodontic therapy (<High school 61.1%, =High school 56.0%,>High school 44.4%). However, as the education level improved, awareness of rehabilitating oral functions became important (<High school 20.1%, =High school 21.0%,>High school 30.4%). This was found to be significant (0.031).

When responses were compared in relation to Angle classifications, Class I participants stated that better alignment of teeth was the most expressed expectation (<High school 67.1%; =High school 63.6.0%; >High school 47.5%). However, oral functions became important as the education level improved (<High school 15.2%; =High school 9.1%; >High school 33.9%). This was found to be significant (p=0.004) (Table 4).

Association between scores related to"Question-4" and educational degree: No interaction between scores and educational degree was found. The scores based on educational degree were also examined according to Angle classification, but type of malocclusion also revealed no interaction (p>0.05).

Scores related to"Question-4" and the participant who answered the question: Scores of mothers were significantly higher than other participants (p=0.020) (Table 5).

Association between responses of"Question-6" and educational degree: Participants having an educational degree less than or equal to high school expressed that dentists should provide information about orthodontic treatments (56.2% and 50.0%, respectively). However, for participants with higher educational degree, getting informed by media was equally important as dentists. Overall, educational degree significantly altered the desired source of information (p=0.002). This was also apparent in Class I cases (p=0.005) (Table 6).

Association between answers to "Question-5" and "Question-6": In general, participants who thought that public should be informed by dentists or via media sources believed that media was a valid source of information (38.8%, 37.4%, respectively). On contrary, majority of subjects (52.2%), that wanted dentists to give more information, did not believe that the media provided satisfactory information regarding orthodontic treatment (p=0.008) (Table 6).

DISCUSSION

Increasing demands of patients about orthodontic treatment provoked clinicians to evaluate the factors that affect the decisions of patients and their parents about how and why they seek treatment.[3] Hence, questionnaire based studies testing those variables are of great importance for the future of orthodontic profession.

In this study, both patients' (77.1%) and parents' (84.6%) decisions about starting an orthodontic treatment was mainly based on the recommendation of dentists. This result was in accordance with previous studies.[19, 23, 24] Oliveira [25] reported that 35.5% of adult patients said that choice of receiving an orthodontic treatment was the suggestion of their general dentist. On the other hand, Uslu and Akcam[22] found the majority (82.5%) of their patients characterized by skeletal Class III anomaly said that they and/or their parents had noticed their problem, which was also supported by Pabari[3]. In contrast, only 22.9% of our patients applied for treatment after noticing their own problem or being told by relatives/friends. Interestingly, only Class I patients realized more about their problem when compared to their parents while answers of patients and parents evaluated under other Angle classifications were similar. Results of our study may also reflect the understanding of our patients/parents from severity of malocclusion and according to our population, dental crowding may be more problematic than their skeletal problems. Correspondingly, crowding in the anterior region was reported to be one of the most unfavorable concern for the patients.[14] A previous study demonstrated that upper anterior crowding was the major occlusal characteristic that influenced the desire for orthodontic treatment in Brazilian adolescents.[26] Not only patient concerns but also the tendency of dentists to recommend orthodontic treatment independently from severity of orthodontic problem may cause this result.[20] Controversial results among studies could be attributed to different levels of satisfaction and perception between individuals, populations, variations related to cultural/racial factors, as well as to individual characteristics.[27, 28]

Table 3. Intragroup comparisons in parents' and patients' responses in realtion to Angle classification, and intergroup comparisons between their responses.

QUESTIONS	ANGLE CLASSIFICATION	PARENTS a n (%)	PARENTS b n (%)	PARENTS c n (%)	P *	PATIENTS a n (%)	PATIENTS b n (%)	PATIENTS c n (%)	P *	P **
1	CLASS I	128 (83.1)	24 (15.6)		0.674	115 (73.2)	41 (26.1)		0.562	**0.024**
	CLASS II,1	117 (81.8)	24 (16.8)			122 (75.3)	35 (21.6)			0.254
	CLASS II,2	25 (83.3)	5 (16.7)			29 (80.6)	7 (19.4)			0.771
	CLASS III	66 (86.8)	8 (10.5)			61 (78.2)	14 (17.9)			0.177
	TOTAL	336 (84.6)	61 (15.4)			327 (77.1)	97 (22.9)			0.006
2	CLASS I	74 (45.7)	60 (37.0)	28 (17.3)	0.943	69 (45.1)	67 (43.8)	17 (11.1)	0.896	0.224
	CLASS II,1	67 (44.4)	59 (39.1)	25 (16.6)		77 (44.0)	73 (41.7)	25 (14.3)		0.813
	CLASS II,2	16 (53.3)	10 (33.3)	4 (13.3)		15 (39.5)	16 (42.1)	7 (18.4)		0.519
	CLASS III	37 (46.8)	32 (40.5)	10 (12.7)		33 (42.3)	32 (41.0)	13 (16.7)		0.736
	TOTAL	194 (46.0)	161 (38.2)	67 (15.9)		194 (43.7)	188 (42.3)	62 (14.0)		0.422
3	CLASS I	107 (58.2)	40 (21.7)	37 (20.1)	0.956	109 (63.4)	39 (22.7)	24 (14.0)	0.040 [a]	0.301
	CLASS II,1	87 (56.1)	30 (19.4)	38 (24.5)		115 (63.5)	28 (15.5)	38 (21.0)		0.377
	CLASS II,2	20 (60.6)	6 (18.2)	7 (21.2)		26 (66.7)	7 (17.9)	6 (15.4)		0.803
	CLASS III	45 (56.3)	15 (18.8)	20 (25.0)		41 (48.2)	19 (22.4)	25 (29.4)		0.588
	TOTAL	259 (57.3)	91 (20.1)	102 (22.6)		291 (61.0)	93 (19.5)	93 (19.5)		0.443
5	CLASS I	66 (42.9)	58 (37.7)	30 (19.5)	0.251	59 (39.6)	52 (34.9)	38 (25.5)	0.720	0.454
	CLASS II,1	58 (41.7)	54 (38.8)	27 (19.4)		68 (43.0)	49 (31.0)	41 (25.9)		0.257
	CLASS II,2	11 (36.7)	7 (23.3)	12 (40.0)		18 (48.6)	7 (18.9)	12 (32.4)		0.616
	CLASS III	35 (46.1)	26 (34.2)	15 (19.7)		31 (40.8)	25 (32.9)	20 (26.3)		0.614
	TOTAL	170 (42.6)	145 (36.3)	84 (21.1)		176 (41.9)	133 (31.7)	111 (26.4)		0.148
6	CLASS I	87 (54.0)	37 (23.0)	37 (23.0)	0.459	93 (61.2)	24 (15.8)	35 (23.0)	0.098	0.250
	CLASS II,1	73 (47.4)	46 (29.9)	35 (22.7)		86 (51.5)	38 (22.8)	43 (25.7)		0.346
	CLASS II,2	12 (36.4)	10 (30.3)	11 (33.3)		18 (47.4)	9 (23.7)	11 (28.9)		0.636
	CLASS III	39 (50.6)	23 (29.9)	15 (19.5)		53 (68.8)	14 (18.2)	10 (13.0)		0.070
	TOTAL	211 (49.6)	116 (27.3)	98 (23.1)		250 (57.6)	85 (19.6)	99 (22.8)		0.018 [b]

[*] Intragroup comparisons of responses for parents and patients, regarding Angle classification; [**] Intergroup comparisons of parents and patients in each classification; p<0.05

[a] Significant difference among Class I versus Class III; [b] Significant difference among parent versus patient in a and b.

Table 4. Distribution of responses to Question-3 with respect to educational degree, and comparisons among Angle classes.

Angle classification	Responses of question-3	<High school n	<High school %	High school n	High school %	>High school n	>High school %	P
Class I	Better alignment of dentition	53	67.1	42	63.6	28	47.5	**0.004**
	Improvement of facial aesthetics	14	17.7	18	27.3	11	18.6	
	Improvement of oral functions(chewing/ speech)	12	15.2	6	9.1	20	33.9	
Class II	Better alignment of dentition	63	64.3	46	50.0	26	43.3	0.054
	Improvement of facial aesthetics	15	15.3	20	21.7	19	31.7	
	Improvement of oral functions(chewing/ speech)	20	20.4	26	28.3	15	25.0	
Class III	Better alignment of dentition	33	49.3	24	57.1	6	37.5	0.685
	Improvement of facial aesthetics	17	25.4	8	19.0	4	25.0	
	Improvement of oral functions(chewing/ speech)	17	25.4	10	23.8	6	37.5	
Total	Better alignment of dentition	149	61.1	112	56.0	60	44.4	**0.031**
	Improvement of facial aesthetics	46	18.9	46	23.0	34	25.2	
	Improvement of oral functions(chewing/ speech)	49	20.1	42	21.0	41	30.4	

SD, standard deviation; p<0.05

Table 5. Comparison of mean scores (Question-4) with respect to participants who answered the questionnaire.

Angle classification	Participant	n (%)	Mean scores	SD	P
Class I	Mother	85 (47.0)	8.0	2.7	0.413
	Father	46 (25.4)	7.7	3.1	
	Self	34 (18.8)	7.4	2.9	
	Relatives	16 (8.8)	6.8	3.1	
Class II,1	Mother	77 (45.0)	8.8	1.9	0.172
	Father	49 (28.7)	7.9	2.6	
	Self	32 (18.7)	7.9	2.9	
	Relatives	13 (7.6)	7.8	2.7	
Class II,2	Mother	18 (47.4)	8.8	2.7	0.400
	Father	10 (26.3)	7.8	3.2	
	Self	9 (23.7)	7.7	3.0	
	Relatives	1 (2.6)	8.0	-	
Class III	Mother	40 (43.5)	8.0	3.3	0.577
	Father	30 (32.6)	7.9	3.0	
	Self	18 (19.6)	7.8	2.9	
	Relatives	4 (4.3)	7.8	2.2	
Total	Mother	220 (45.6)	8.3 [a]	2.6	**0.020**
	Father	135 (28.0)	7.8 [a,b]	2.9	
	Self	93 (19.3)	7.7 [b]	2.9	
	Relatives	34 (7.1)	7.4 [b]	2.8	

SD, standard deviation; p<0.05

Stenvik *et al* [29] stated that one's decision about orthodontic treatment can be influenced by not only factors about patients, but also provider factors such as appreciation of treatment need, access to services, cost of treatment and treatment priority. In this study, the main factors that motivate both patients and parents to apply to a university clinic were the existance of social security and trust to academic facilities due to faculty supervision. According to the health care policy, all citizens under 18 are under government insurance for dental treatments, and for adult patients although the system doesn't support the whole treatment, it is still cheaper than private clinics. This issue may also lead parents/patients to question whether private clinics would insist on treatment in order to earn money and quality differences. Despite this anecdote and different health care policies or grading of treatment outcomes between Turkey and USA, treatment outcomes of university clinics and private clinics were found to be comparable[30] or even private clinic results were better than university clinics.[31]

Our findings revealed that obtaining better alignment of teeth and dental aesthetics was the main determinant of orthodontic treatment demands of both parents (57.3%) and patients (61.0%). This result was in accordance with previous literature.[3, 4, 10, 26] Although not evaluated in this study, Hosoda *et al* [32] reported a positive correlation between facial attractiveness and interpersonal popularity, as well as how one's personality and social behaviors can be judged. Thus, it may be the driving force of expectations from an orthodontic treatment. Furthermore, the desire for improvements in oral functions demonstrated significant difference

Table 6. Distribution of responses to Question-5 and Question-6 in relation to educational degree and *Angle classification.*

Angle classification	Responses of question-6	Educational degree						P	Idea for media sources to be adequate (Question-5)						P
		< High school		High school		> High school			Yes		No		No idea		
		n	(%)	n	(%)	n	(%)		n	(%)	n	(%)	n	(%)	
Class I	Dentists	48	(63.2)	34	(54.8)	23	(42.6)	0.005	45	(52.3)	37	(50.7)	25	(62.5)	0.695
	Media sources (radio,TV,internet)	17	(22.4)	8	(12.9)	20	(37.0)		23	(26.7)	17	(23.3)	8	(20.0)	
	University hospitals	11	(14.5)	20	(32.3)	11	(20.4)		18	(20.9)	19	(26.0)	7	(17.5)	
Class II	Dentists	45	(50.0)	33	(45.8)	17	(30.4)	0.052	11	(14.7)	41	(53.9)	27	(44.3)	<0.001
	Media sources (radio,TV,internet)	22	(24.4)	16	(22.2)	24	(42.9)		40	(53.3)	16	(21.1)	16	(26.2)	
	University hospitals	23	(25.6)	23	(31.9)	15	(26.8)		24	(32.0)	19	(25.0)	18	(29.5)	
Class III	Dentists	30	(56.6)	16	(50.0)	7	(58.3)	0.352	24	(53.3)	16	(51.6)	14	(56.0)	0.816
	Media sources (radio,TV,internet)	10	(18.9)	12	(37.5)	3	(25.0)		14	(31.1)	8	(25.8)	5	(20.0)	
	University hospitals	13	(24.5)	4	(12.5)	2	(16.7)		7	(15.6)	7	(22.6)	6	(24.0)	
Total	Dentists	123	(56.2)	83	(50.0)	47	(38.5)	0.002	80	(38.8)	94	(52.2)	66	(52.4)	0.008
	Media sources (radio,TV,internet)	49	(22.4)	36	(21.7)	47	(38.5)		77	(37.4)	41	(22.8)	29	(23.0)	
	University hospitals	47	(21.5)	47	(28.3)	28	(23.0)		49	(23.8)	45	(25.0)	31	(24.6)	

between Class I and Class III patients. Likewise, in the study of Bernabe *et al* [33] the most frequently affected daily performance in Class III malocclusion was eating when compared to normal group (34.5 and 20.0%, respectively). Supporting those results and ours, English et al[34] investigated objective and perceived chewing performance of patients with malocclusions and found that normal group (no malocclusion) and Class I group had significantly smaller particles and broader distribution of particles than Class III group, which meant they had better chewing performance. Same patients also reported they were significantly more able to chew steak and other firm meats than Class III group. Almost 25% of Class III group reported difficulties in chewing raw carrots, raw celery, steak or other firm meats. According to another study exploring variables affecting Class III patients satisfaction after surgery, patients described their primary intention to undergo surgery was improvement of aesthetic and chewing functions together.[35] Concerning impairment of speech, Farronato *et al* [36] found a high tendency to be associated with inability to articulate comprehensible speech (dyslalia) in the presence of Class III occlusion. Guay [37] also spotted that two thirds of Class III malocclusion group distorted one or more sibilant class of phonemes and almost all of them distorted /s/ phoneme from mild to moderate degree during spontaneous speech. Although how functions affected were not evaluated specifically in our questionnaires, previous data would be helpful to enlighten why Class III patients are keen on functional improvement.

Participants were also asked to rate their level of concern for the existing orthodontic problem by giving a score from 1 to 10. Findings showed no significant differences between parents and patients. In general participants gave an approximate rating of eight indicating maximum concern, regardless of Angle classification. This might depend on psychological and motivational factors in order to deserve an access to orthodontic treatment. In this sense, conclusions of Dann *et al* [23]may support this idea of ours; the degree of malocclusion does not affect the decision to undergo treatment as much as the perceived aesthetics of the malocclusion.

In recent years, the role of social media as a source of getting and sharing information is increasing.[21, 38-40] As the use of media sources gets common for medical conditions, public's perception about them is becoming a concern. That's why reliability of media sources was one of the basic aspects of this questionnaire. Almost half of the parents (42.6%) and patients (41.9%) agreed that, they can rely on media sources for information about orthodontics. Around 20% also wanted to be informed about treatments via internet, radio and/or television programs, which was significantly apparent for parents. There was a positive correlation between those who rely on and accept media as a source of information. On contrary, participants who did not trust media wanted to update their knowledge about orthodontics via their dentists. Among all participants, "seminars organized by university clinics" was the least attractive choice of source of information. Those results can represent the fact that people need sources, which can be reached easily and quickly.

The current study was one of the very few studies, and probably the only one from Turkey, which reported the attitudes of patients and parents towards orthodontic treatment in a university clinic and the potential factors that would affect their decisions. Age and gender differences were not the main focus points although they might play a role in perception of orthodontic problems and therefore applying for orthodontic treatment. Despite this limitation, as a popular method of communication between professionals and patients, evaluation of media sources and the data about it was crucial and supportive about the importance of high quality media resources about orthodontics.

CONCLUSIONS

1. Reaching better dental aesthetics was the primary motivating factor both for patients who seek orthodontic treatment and parents/guardians.
2. Reasons for preferring university were listed as presence of social security and trust to academic facilities.
3. Clinicians should take into account the concerns of Class III patients during treatment planning regarding the improvement of oral functions. Other than that, there was no effect of malocclusion on decision making or participants.
4. As education background gets better, improvement of oral functions is realized to be crucial as well as improvement in dental esthetics.
5. Although dentists are still the major information source for orthodontics, role of media sources is becoming evident. Orthodontists in practice should be aware of most patients and parents/guardians request information via media sources and respect to its truthfulness.

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