



Determination of the Orthodontic Treatment Needs of Primary School Students

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Abstract

Objective: In this cross-sectional study, it was aimed to determine orthodontic treatment need of students who applied to a university hospital and investigate the effects of familial factors on the desire for treatment.

Methods: In the study, 100 patients, which consisted of primary school students, were intraorally examined and it was determined whether they had any problems to require orthodontic treatment. The parents of the patients were asked for children's age, gender, school type, place of residence, mother's education level (MEL), father's education level (FEL), family's monthly income level (IL) and whether they desired orthodontic treatment.

Results: Statistically significant differences were observed between the B1 group and those with MEL of university, between the A2 group and FEL of primary school, and between A2 and IL of 1000 - 2000 Turkish Liras (TL) ($p < 0.05$) while it was determined that there was no statistically significant difference in the comparisons of other groups according to age, gender, school type and place of residence ($p > 0.05$).

Conclusions: Finally, it was concluded that every type of expenses of treatment for families with low income levels should be covered by governments. It is believed that the direct application of patients, who did not require orthodontic treatment, to orthodontics clinic should be prevented and first examination units should not refer patients just because patients want it.

Keywords: Orthodontic Treatment; Orthodontic Anomaly; Requirement for Orthodontic Treatment

Introduction

Patients who apply to hospitals want to be diagnosed correctly and to receive all the related treatments. Considering the ever-increasing population and busyness of hospitals, treatments for more complaints are conducted day after day. Orthodontics is the department of dentists that treats and corrects disorders in teeth, in dental arches, in the relationship between teeth and jaws and in the relationship between jaws and skull [1,2]. The aim of orthodontics is not only correcting crowding teeth but also treating incompatibilities and irregularities that can occur in the formation of the skull and facial skeleton [3]. As in many other clinics, there are patients who unnecessarily apply to orthodontics clinics without any problems. In faculties of dentistry or dentistry hospitals, an unnecessary busyness is created by referring patients to orthodontics clinic regardless of checking whether they have an orthodontic anomaly. Additionally, clinics become busy with unnecessary patients and the treatment to provide for the main patients is interrupted, which causes late services of the provided treatment, increases in the rate of patients' dissatisfaction,

increases in cost and decreases in employee motivation and quality of service [4-10]. While many of the patients who apply to orthodontics clinic have tooth cavity, tartar and teeth that require root canal treatment and even extraction as well as not having an instruction or behavior for brushing teeth regularly, they apply to the orthodontics clinic, stating that they want to have orthodontic treatment. While the materials used during orthodontic treatment cause plaque accumulation and reduce oral hygiene, patients who already have bad oral hygiene should initially be provided with hygiene instruction [11-13].

It is of utmost significance to diagnose, recognize the anomalies and classify them for a correct treatment for patients who apply for orthodontic treatment [1,2,14-17]. The existence of different methods in classifications makes the detection and the standardization of anomalies difficult [18-22]. Nonetheless, the most commonly used classification today is Angle's [23] classification. As a result, it was decided to conduct this study to examine the necessity of the applications and evaluate orthodontic anomalies.

Materials and Methods

In this study, the ethical principles stated in the Helsinki Declaration of the World Medical Association (WMA) have been adhered to. The Ethics Committee approval was obtained from the Firat University Ethics Committee dated 10/01/2019 and numbered 24.

In this cross-sectional study, it was aimed to determine orthodontic treatment need of students, who applied to a university

hospital, and investigate the effects of familial factors on desire for treatment.

In the study, 100 patients, which consisted of primary school students, were intraorally examined and it was determined whether they had any problems to require orthodontic treatment. The parents of the patients were asked for children’s age, gender, school type, place of residence, mother’s education level (MEL), father’s education level (FEL), family’s monthly income level (IL) and whether they desired orthodontic treatment (Table 1).

Orthodontic Anomaly	Non-existent <input type="checkbox"/>	Existent <input type="checkbox"/>			
Gender	Female <input type="checkbox"/>	Male <input type="checkbox"/>			
School	State <input type="checkbox"/>	Private <input type="checkbox"/>			
Age					
Place of Residence	City <input type="checkbox"/>	County <input type="checkbox"/>	Town <input type="checkbox"/>	Village <input type="checkbox"/>	
Mother’s Education Level	Primary School <input type="checkbox"/>	Secondary School <input type="checkbox"/>	High School <input type="checkbox"/>	University and Higher <input type="checkbox"/>	
Father’s Education Level	Primary School <input type="checkbox"/>	Secondary School <input type="checkbox"/>	High School <input type="checkbox"/>	University and Higher <input type="checkbox"/>	
Family’s monthly income level	1000 TL and lower <input type="checkbox"/>	1000- 2000 TL <input type="checkbox"/>	2000- 3000 TL <input type="checkbox"/>	3000- 4500 TL <input type="checkbox"/>	4500 TL <input type="checkbox"/> and Higher
Would you like your child to receive orthodontic treatment?	Yes <input type="checkbox"/>	No <input type="checkbox"/>			

Table 1: Follow-up Form.TL=Turkish Liras.

Initially, depending on the existence of an orthodontic anomaly in the examinations of these patients, the patients were divided into two groups. These groups were then coded as those who require orthodontic treatment (A) (n = 62, 62%) and those who did not require orthodontic treatment (B) (n = 38, 38%). According to the Angle’s classification [24,25] in the examination, the patients who were classified in Class I and did not have diastema, crowding (excluding those who had minimal levels), vestibule-position, lingo-position, palato-position, rotation, infra-position, supra-position, mesio-position, disto-position in their teeth were placed in the group that did not require treatment while the patients who were classified in Class II, Class III and the patients who had polydiastema, intense crowding, out-of-arch and in rotation teeth in spite of being classified in Class I, shortly, the patients out of the group that did not require treatment, were placed in the group that required orthodontic treatment.

The answers provided by the parents of the patients were recorded. According to the last question, “Would you like your child to receive orthodontic treatment?”, the patients were divided into two groups. These were coded as the group that desired orthodontic treatment [1] (n = 58, 58%) and the group that did not desire orthodontic treatment [2] (n = 42, 42%). In the evaluation of these groups in terms of both of the classifications, four new groups were formed as those who desire orthodontic treatment while it is necessary (A1) (n = 35, 35%), those who did not desire orthodontic treatment while it is necessary (A2) (n = 27, 27%), those who desire orthodontic treatment while it is not necessary (B1) (n = 23, 23%)

Results

and those who did not desire orthodontic treatment while it is not necessary (B2) (n = 15, 15%). The data formed by the information obtained from the parents were evaluated statistically.

The normality of distribution of continuous variables was tested by Shapiro Wilk test. Chi-square test was used to investigate the relationship between two categorical variables and Bonferroni correction was applied to adjust p values for multiple comparisons when Chi-square test result is significant. Furthermore, a multivariate binary logistic regression model was built to determinate important factors for making a treatment decision and for estimating the adjusted ORs and 95% CIs. Statistical analysis was performed with SPSS for Windows version 24.0 and a p value < 0.05 was accepted as statistically significant.

The mean age of the 100 patients included in the study was 11.70 ± 1.66 years old (Table 2). The groups were observed to be balanced in terms of age (p=1.661).

	N	Minimum	Maximum	Mean ± SD	p
Age	100	8	15	11.70 ± 1.66	1.661

Table 2: Age Distribution.

The patients include 54 females (54%) and 46 males (46%) (Table 3). The groups were observed to be balanced in terms of gender (p=0.621).

Gender	N	%	p
Male	46	46,0	0.621
Female	54	54,0	

Table 3: Gender Distribution.

Statistically significant differences were observed between MEL and treatment decision ($p = 0.031$) (Table 4). With the Bonferroni correction, in the comparisons of groups in themselves, it was determined that the rate of those who desired treatment while it was not necessary in MEL of university were significantly higher compared to those who did not desire treatment while it was necessary ($p = 0.025$).

		Necessary Treatment and Desire for Treatment n (%)	Necessary Treatment but No Desire for Treatment n (%)	Unnecessary Treatment but Desire for Treatment n (%)	Unnecessary Treatment and No Desire for Treatment n (%)	P
Gender	Male	16 (47,1)	13 (46,4)	9 (39,1)	8 (53,3)	0.854
	Female	18 (52,9)	15 (53,6)	14 (60,9)	7 (46,7)	
School Type	State	24 (70,6)	19 (67,9)	16 (69,6)	9 (60)	0.903
	Private	10 (29,4)	9 (32,1)	7 (30,4)	6 (40)	
Place of Residence	City	30 (88,2)	24 (85,7)	21 (91,3)	14 (93,3)	0.795
	County	2 (5,9)	1 (3,6)	1 (4,3)	1 (6,7)	
	Village	2 (5,9)	3 (10,7)	1 (4,3)	0 (0)	
Mother's Education Level	Primary School	8 (23,5)	8 (28,6)	2 (8,7)	5 (33,3)	0.031*
	Secondary School	6 (17,6)	6 (21,4)	0 (0)	2 (13,3)	
	High School	11 (32,4)	8 (28,6)	7 (30,4)	5 (33,3)	
	University and Higher	9 (26,5)	6 (21,4)	14 (60,9)	3 (20)	
Father's Education Level	Primary School	9 (26,5)	16 (57,1)	8 (34,8)	6 (40)	0.044*
	High School	10 (29,4)	7 (25)	9 (39,1)	4 (26,7)	
	University and Higher	15 (44,1)	5 (17,9)	6 (26,1)	5 (33,3)	
Income Level	<1000 TL	1 (2,9)	3 (10,7)	3 (13)	2 (13,3)	0.001*
	1000-<2000 TL	9 (26,5)	23 (82,1)	2 (8,7)	2 (13,3)	
	2000-<3000 TL	10 (29,4)	2 (7,1)	6 (26,1)	4 (26,7)	
	3000-<4500 TL	7 (20,6)	0 (0)	6 (26,1)	4 (26,7)	
	4500 TL>	7 (20,6)	0 (0)	6 (26,1)	3 (20)	

Table 4: Association of the groups and other variables.

* $p < 0.05$ level of significance.

Statistically significant differences were observed between father's education level and treatment decision ($p = 0.044$) (Table 4). With the Bonferroni correction, in the comparisons of groups in themselves, it was determined that the rate of those who did not desire treatment while it was necessary in FEL of primary school were significantly higher compared to those who desired treatment while it was necessary ($p = 0.025$).

Statistically significant differences were observed between income level and treatment decision ($p = 0.001$) (Table 4). The rate of those who did not desire treatment while it was necessary in the income level of 1000-2000 TL was significantly higher compared to the other three categories ($p = 0.001$, $p = 0.001$, $p = 0.001$, respectively).

Those who had MEL of university desired treatment 4 times more compared to those who had MEL of primary school (Table 5).

Those with an income level of 4500 TL and higher desired treatment 9.7 times more compared to those with an income level of 1000 TL and lower. Similarly, those with an income level of 2000 - 3000 TL desired treatment 6 times more and those with an income level of 3000 - 4500 TL desired treatment 9.4 times more (Table 5).

In the desire for treatment, the most significant factor was determined to be income level, followed by the mother’s education level and the necessity for treatment as at the last (Table 6).

Variable	OR [95% CI]	P*
Necessity for treatment vs. No Necessity	2.96 [0.93-9.44]	0.066
MEL of secondary school vs primary school	0.81 [0.16-3.93]	0.795
MEL of high school vs. primary school	3.40 [0.89-12.97]	0.073
MEL of university vs. primary school	4.09 [1.09-15.31]	0.037*
GD 1000-<2000 vs. <1000 TL	0.58 [0.11-3.01]	0.517
GD 2000-<3000 vs. <1000 TL	6.02 [1.01-35.77]	0.048*
GD 3000-<4500 vs. <1000 TL	8.39 [1.22-57.61]	0.030*
GD 4500> vs. <1000 TL	9.70 [1.36-69.02]	0.023*

Table 5: The evaluation of factors affecting the desire for treatment by multivariate binary logistic regression.

OR: Odds Ratio; CI: Confidence Interval.

*p<0.05 level of significance.

		No Desire for Treatment n (%)	Desire for Treatment n (%)	P
Necessity for Treatment	Unnecessary	15 (34,9)	23 (40,4)	0.577
	Necessary	28 (65,1)	34 (59,6)	
Gender	Male	21 (48,8)	25 (43,9)	0.621
	Female	22 (51,2)	32 (56,1)	
School Type	State	28 (65,1)	40 (70,2)	0.591
	Private	15 (34,9)	17 (29,8)	
Place of Residence	City	38 (88,4)	51 (89,5)	0.932
	County	2 (4,7)	3 (5,3)	
	Village	3 (7)	3 (5,3)	
Mother’s Education Level	Primary School	13 (30,2)	10 (17,5)	0.124
	Secondary School	8 (18,6)	6 (10,5)	
	High School	13 (30,2)	18 (31,6)	
	University and Higher	9 (20,9)	23 (40,4)	
Father’s Education Level	Primary School	22 (51,2)	17 (29,8)	0.090
	High School	11 (25,6)	19 (33,3)	
	University and Higher	10 (23,3)	21 (36,8)	
Income Level	<1000 TL	5 (11,6)	4 (7)	0.001*
	1000-<2000 TL	25 (58,1)	11 (19,3)	
	2000-<3000 TL	6 (14)	16 (28,1)	
	3000-<4500 TL	4 (9,3)	13 (22,8)	
	4500 TL>	3 (7)	13 (22,8)	

Table 6: Association of desire for treatment and other variables.

*p<0.05 level of significance.

Discussion

In the B1 group, parents of the patients stated that they referred to the treatment in order to not have concern for treatment ques due to rather aesthetical concerns and in case of a necessity for treatment in the future. It was believed that the parents in this group were conscious about the treatment and had such a desire to

benefit from the funding provided by the Social Security Institution (SSI) of the Republic of Turkey. The parents of the patients in the A2 group stated that the reason for no desire for treatment while it was necessary was financial insufficiencies. This was further confirmed by the facts that the income level of parents in the A2 group was at a level of minimum wage and it was determined to be statistically

significant. The fact that there were significant differences in the A2 group for those with FEL of primary school was believed to be due to the chances of finding a lower-wage job at this education level rather than not being conscious. In other words, this was believed to be an indirect reason because FEL affected IL. This was because it was also those parents who brought their children to the hospital and wanted to receive information about their health status. In a similar study conducted in orthodontics literature, it was reported that familial reasons affected treatment decisions and treatment continuation of patients' parents [26].

Conclusion

Finally, it was concluded that every type of expenses of treatment, including expenses for materials, for families with low-income levels socioeconomically should be covered by governments. It is believed that the direct application of patients, who did not require orthodontic treatment, to orthodontics clinic should be prevented to avoid the busyness caused by patients without orthodontic anomalies and make more time for patients who need treatment and first examination units should not refer patients just because patients want it.

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