



Original Research

Factors related to orthodontic treatment time in indian adult patients – A retrospective study

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Abstract

Aim : To research the effects of various factors on treatment duration.

Objective : To examine the impact on the duration of orthodontic treatment for adult patients of age, sex, facial pattern, kind of malocclusion, type of brackets, number of tooth extractions, and missing appointments.

Materials and method : 110 clinical case reports of adult patients who had successful treatment were looked at. Three seasoned orthodontists chose the patients from 500 records in their possession. Age, sex, facial profile, kind of malocclusion, type of brackets, tooth extractions, and missed appointments were evaluated for their effects on treatment time. Multiple linear regression analysis was used to evaluate, then the stepwise procedure with $P < 0.05$.

Results : No-show rates ($R^2 = 21.1\%$, $p = 0.001$), facial profile ($R^2 = 2.4\%$, $p = 0.081$), type of occlusion at the beginning of treatment ($R^2 =$), and patient sex ($R^2 = 0.6\%$, $p = 0.395$) all had an impact on the variability in treatment time. The length of treatment was not significantly influenced by additional variables such as bracket type (metal or ceramic), tooth extractions, or age at the beginning of therapy.

Conclusion : Adult orthodontic treatment times are mostly impacted by patient compliance-related variables. However, a number of factors that were left out of this study could be responsible for the heterogeneity in orthodontic treatment times.

Keywords: Treatment duration, Molar relationship, age, facial profile, adult patients.

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INTRODUCTION

In the modern environment, young people are more concerned with aesthetic perfection. Because of this, more and more adult patients are seeking orthodontic treatment to enhance both function and attractiveness. (1). Lack of active growth, a higher prevalence of tooth damage, and periodontal abnormalities are the main factors that affect the treatment strategy for adult patients versus juvenile patients. (2,3). Orthodontic therapy for adults might take a variety of times. Therefore, the length of the treatment is a big problem for adults. Numerous research have been conducted to look at the variables that affect how long it takes orthodontic patients to complete their treatment. Age, 3-7, and sex (4,5,8,9), usage of brackets, The number of extractions performed initially (11–15), the initial severity of malocclusion (9–11), the type of brackets used (9–11), the initial molar relationship (9–11), the number of missed appointments (15–24), the patients' oral hygiene status, and the orthodontist's experience are all significant factors that affect the length of treatment.

In the literature, several authors used extraction, the degree of malocclusion, and the relationship between the teeth to produce erratic results that could shorten the course of therapy.

Despite the aforementioned variations, no research on the factors significantly affecting the length of treatment for adult patients has been published. The purpose of this study is to examine the effects that various factors have on the length of treatment for adult patients.

MATERIALS AND METHODS

In this study, records from 500 patients who received orthodontic treatment were examined. Patients under the age of 18, patients with incomplete records, patients with more than one missing tooth in each quadrant, patients who have had orthognathic surgery in the past, patients who have missed more than six consecutive appointments in a row, cases requiring retreatment, and class III malocclusion were excluded. Patients must be between the ages of 18 and 30 and have malocclusions that fall into Angle Classes I or II based on molar relationship. Only 110 records out of 500 met the requirements for inclusion, 56 of which were female and 54 male.

The number of months spent receiving orthodontic care was the primary factor under study. Other factors included age at treatment's beginning, sex, facial profile, kind of malocclusion, anticipated number of extractions, and type of extraction.

RESULTS

A correlation matrix was initially used in this study to determine whether predictor variables might be connected to treatment time. The multiple linear regression analysis, which was supplemented by linear stepwise regression, comprised variables with substantial associations.

Table 1 summarizes the variables in this study

SEX	N	%
Female	56	50.9%
Male	54	49.1%
MOLAR RELATIONSHIP	N	%
Class I	79	71.8%
Class II	31	28.2%
TYPE OF BRACKETS	N	%
Metal brackets	91	82.7%
Ceramic brackets	9	8.18%
Self ligating brackets	10	9.12%
FACIAL PROFILE	N	%
Straight profile	88	80%
Convex profile	22	20%

Table 2 - Descriptive analysis of numerical variables

VARIABLES ANALYSED	Mean	Standard deviation
Duration of treatment in months	22.40	4.48
Age at start of treatment	21.16	2.94
Months of missed appointments	1.83	1.28
No of extractions	1.32	1.74

Table 3 - linear regression and correlation matrix analysis

Independent Variables (n=110)	Correlation matrix				Linear regression		
	Multiple				Stepwise		
		p value	F	R ²	p value	R ²	Variability R ²
Months of missed appointment	0.459	<0.001			<0.001	21.1%	21.1%
Facial pattern	0.219	0.021			0.081	23.5%	2.4%
Type of occlusion	0.175	0.068			0.395	24.1%	0.6%
Gender	0.165	0.086	8.95	0.22	0.130	25.8%	1.7%
No of extractions	0.096	0.316					
Type of brackets	-0.095	0.323					
Age at start of treatment	0.083	0.390					

In this study, total mean treatment duration was 22.4 months. Table 2 summarises that the mean age of the patient at the beginning of treatment was 21.16 years. The average time period of missed appointments was about 1.83 months, and the mean number of extractions done in patients was 1.32.

Table 3 revealed that the variables “months of missed appointments, and facial profile were somewhat correlated ($p < 0.05$) with the length of treatment. The variable “type of occlusion and sex” were also included due to its p -value (0.0543), which was very close to the value established for the level of significance.

Only "months of missed appointments" ($p < 0.001$) showed significant among the four dependent variables examined by multiple linear regression ($p < 0.001$). Stepwise regression revealed that the four variables together had a 25.8% impact on treatment time variability, with "months of missed appointments" having the largest impact (21.1%) ($p < 0.001$), followed by "facial profile" (2.4%), "sex of the patient" (1.7%), and "type of occlusion at the start of treatment" (0.6%).

DISCUSSION

The length of orthodontic treatment is a constant source of anxiety for adults. As a result, characterising the principles of orthodontic therapy for adult patients greatly benefits from examining the influence of elements that are relevant to orthodontic treatment. Numerous research have looked into the variables relating to therapy duration. Additionally, the inconsistent results have cast doubt on which variables may clearly affect the length of treatment for adults.

The average treatment time in this trial was 22.4 months. In contrast to Melo et al (1991), which had a mean treatment length of 32.2 months, Dyer et al (3) 's study had a mean of 30.7 months, and Robb et al (7) 's study had a mean of 30.6 months. These investigations only addressed Class II malocclusion, however in this study both Class I and Class II patients were taken into account, accounting for 71.8% and 28.2%, respectively.

"Months of missed appointments" ($p < 0.0001$), a factor that explained 21.1% of the variation in treatment duration, was the variable that demonstrated statistically significant influence on treatment time. Similar findings had been made in the past by, Fink DF et al, Skidmore et al, Beckwith et al, De Saturno et al, and Robb et al Maria FRT (4, 5, 7, 9, 18, 21)

This study revealed that the type of malocclusion—Class I or Class II—had a 0.6% impact on the length of treatment. According to a few studies (9,11), patients with Class II malocclusion appear to require more time for treatment than Class I individuals. However, several investigations indicated that the molar connection had no effect on treatment duration. (10) Whether a bracket was metal or ceramic, the variable "kind of bracket" had no bearing on how long treatment lasted. This was consistent with the findings of Beckwith et al. (4) and

Melo et al (25)

The choice of whether to extract or not, as well as the anticipated number of extractions, has been a subject of extensive investigation. The decision to extract or not does not influence treatment time, according to the study's findings. This result is in agreement with research by Beckwith et al., Poppwich et al., (10) and Bhattarai et al (17). In this study, patient sex had a 1.7% impact on treatment time variability. This outcome was comparable to that of Skidmore et al., who discovered that having male patients is a predictor of a lengthier course of treatment (9).

CONCLUSION

The following conclusions can be made in light of the study's findings:

1. Missed appointments by patients contributed significantly to the prolongation of the treatment process.
2. Other variables like the quantity of extractions, whether ceramic or metal brackets were used, and the patient's beginning age had no appreciable impact on the length of treatment for adult patients.
3. It was shown from this study that these variables only accounted for 25.8% of the overall influence on the duration of treatment, indicating that more factors need to be looked at in order to ascertain the precise length of time needed for orthodontic treatment in adults.

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CONFLICT OF INTEREST

No conflict of interest of relevant to this article was reported.

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