Original Article

Prospective evaluation of the psychosocial impact of the first 6 months of orthodontic treatment with fixed appliance among young adults

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ABSTRACT

Objective: To evaluate the psychosocial impact of the first 6 months of orthodontic treatment with a fixed appliance among young adults and compare the results with those of a control group of patients awaiting treatment for malocclusion.

Materials and Methods: A study was conducted with a sample of 120 patients on a waiting list for orthodontic treatment at a university. The participants were allocated to an experimental group submitted to treatment and a control group awaiting treatment. The groups were matched for sex and age. All participants were instructed to answer the Brazilian version of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) at baseline and after 6 months. Statistical analysis involved the Wilcoxon test for the total PIDAQ score and the score of each subscale. All patients participated until the end of the study.

Results: Significant differences between baseline and the 6-month evaluation were found for the total PIDAQ score as well as the dental self-confidence and social impact subscales in both groups. No differences between baseline and the 6-month evaluation were found regarding the psychological impact or esthetic concern subscales in the control group. The patients in the experimental group reported greater esthetic impact 6 months after beginning treatment ($P < .001$). The first 6 months of orthodontic treatment seem to improve psychosocial impact.

Conclusions: The first 6 months of orthodontic treatment seem to improve the psychosocial impact of malocclusion. The patients analyzed in the present study reported a greater esthetic impact and less psychological impact after 6 months of using an orthodontic appliance. (*Angle Orthod.* 2016;86:644–648.)

KEY WORDS: Quality of life; Orthodontics; Malocclusion

INTRODUCTION

In recent years, studies have frequently investigated the perceptions of individuals regarding oral conditions that affect quality of life. In a recent systematic review of high quality studies, the authors concluded that malocclusion exerts a negative impact on the quality of life of adolescents.[1] Moreover, malocclusion mainly affects social interactions and psychological well-being.[2–5] These findings are explained by the fact that the esthetics of the mouth and smile plays an important role in facial attractiveness.[5,6] However, the indication for orthodontic treatment is often based on clinical criteria[7,8] without considering the patient's perceptions. This should be rethought because the success of orthodontic treatment depends on the partnership between the orthodontist and the patient. Thus, it is fundamental for orthodontists to address their patients' expectations regarding treatment.

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In addition to considering patients' expectations, it is important to know the impact of therapeutic interventions in oral health–related quality of life (OHRQoL). This can be useful to orthodontists in improving their ability to motivate their patients to cooperate in the treatment. A prospective study involving adults found no change in the impact on quality of life measured before and after treatment, but the patients reported a negative impact on quality of life in the first 3 months of treatment.[9] Similar findings are reported in a study conducted in China.[10] However, a Brazilian study found that orthodontic treatment has a positive effect on the quality of life of adolescents after 1 year of treatment.[11] Another Brazilian study demonstrated that young adults who underwent orthodontic treatment reported less of an impact on quality of life than did those awaiting treatment.[12]

Since malocclusion can lead to concerns about a patient's dentofacial appearance, it is important to evaluate the patient's perceptions as an outcome in orthodontics.[13] Few studies evaluating OHRQoL have used specific questionnaires to evaluate the psychosocial impact of dental esthetics. Moreover, these studies failed to control the time effect on the change in self-reported OHRQoL.

The aims of the present study were to evaluate the psychosocial impact of the first 6 months of orthodontic treatment with a fixed appliance among young adults and compare the results with those of a control group of patients awaiting treatment.

MATERIALS AND METHODS

This study received approval from the institutional review board of UNINCOR under protocol 387.212.

Sample

The sample was composed of young adults aged 18 to 30, registered for orthodontic treatment with a fixed appliance at the Department of Orthodontics, Faculty of Dentistry, UNINCOR. The sample size was calculated based on a standard deviation of 2.11 points (determined in a pilot study) and a one-point difference to be detected. Thus, 55 individuals would be required to provide an 80% statistical power in identifying a significant difference in psychosocial impact before and after 6 months of treatment. The probability of a type 1 error was 5%. The sample was increased by five individuals to compensate for possible dropouts.

Among the patients scheduled to begin orthodontic treatment with a fixed appliances, 60 were deemed eligible for inclusion in the study as the experimental group. A control group was then formed of 60 patients awaiting treatment. The two groups were matched for gender and age. In each pair, one subject was randomly selected to start treatment. The 120 individuals were then contacted by the research team and given information on the study objectives. All patients recruited agreed to participate in the study. All participants were literate, fluent in Brazilian Portuguese, and free of any cognitive impairment or oral disorder that might impede orthodontic treatment, such as untreated dental caries, untreated tooth injury, or periodontal disease.

Evaluation of Psychosocial Impact

The participants in both groups were asked to answer the Brazilian version of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ)[14] on two occasions. The experimental group answered the questionnaire before the placement of appliances and after 6 months of usage. The control group answered the questionnaire with a 6-month interval between sessions.

The PIDAQ is a psychometric measure composed of 23 items divided among four subscales: esthetic concern (3 items), psychological impact (6 items), social impact (8 items), and dental self-confidence (6 items). Each item is scored on a five-point scale ranging from 0 (no impact) to 4 (maximum impact). Most items employ a negative approach, such as "I don't like to see my teeth" and "I hide my teeth." Other items have a positive approach, such as "I am proud of my teeth" and "I like to show my teeth when I smile." Thus, the response options for negatively worded items are as follows: 0 = not at all, 1 = a little, 2 = somewhat, 3 = strongly, and 4 = very strongly agree. For positively worded items, the scoring is reversed: 4 = not at all, 3 = a little, 2 = somewhat, 1 = strongly, and 0 = very strongly.[15]

Clinical Evaluation

The normative need for orthodontic treatment was determined using the Dental Aesthetic Index (DAI). A single examiner who had previously undergone training and calibration performed the clinical evaluations. Calibration was done by comparing the results from 30 young adults aged 18 to 30 by the examiner and the gold-standard researcher. The Cohen Kappa value for interexaminer agreement was 0.91. To calculate intraexaminer agreement, 20 subjects were reexamined; with an interval of 2 weeks, the Cohen Kappa value was 1.00. The DAI furnishes four possible results: $\leq$25 = slight treatment need; 26 to 30 = elective treatment need; 31 to 35 = treatment is highly desirable; and $\geq$36 = treatment is necessary.

Table 1. Demographic Characteristics of Sample at Baseline

Variables	Treated Group n (%)	Untreated Group n (%)
Sex		
Male	30 (50.0)	30 (50.0)
Female	30 (50.0)	30 (50.0)
Age		
18 years	4 (6.6)	4 (6.6)
19 years	12 (20.0)	12 (20.0)
21 years	8 (13.4)	8 (13.4)
22 years	7 (11.6)	7 (11.6)
23 years	5 (8.4)	5 (8.4)
25 years	8 (13.4)	8 (13.4)
26 years	6 (10.0)	6 (10.0)
27 years	6 (10.0)	6 (10.0)
20 years	4 (6.6)	4 (6.6)
Orthodontic treatment need (DAI score)		
Slight treatment need (≤ 25)	8 (13.4)	9 (15.0)
Elective treatment (26–30)	15 (25.0)	12 (20.0)
Highly desirable treatment (31–35)	16 (26.6)	17 (28.4)
Mandatory treatment (≥ 36)	21 (35.0)	22 (36.6)

Data Analysis

The data were organized and statistically analyzed using the Statistical Package for the Social Sciences (SPSS for Windows, version 20.0, SPSS Inc, Chicago, Ill). Median, minimum, and maximum values were calculated for the total PIDAQ score and each subscale score. The Kolmogorov-Smirnov test demonstrated that the data exhibited nonnormal distribution. Thus, a nonparametric, repeated-measurements test was employed. The Wilcoxon test was used to determine differences in the scores between baseline and the 6-month evaluation.

RESULTS

All patients participated until the end of the study. The distribution of males and females in the sample was equal (50%). Mean age was 23.2 ± 4.6 years in both groups. Orthodontic treatment need was classified as necessary for most of the individuals in both groups (Table 1). Table 2 shows significant reductions in the total PIDAQ score as well as the social impact and dental self-confidence subscales in both groups. Only the group that received treatment exhibited a significant reduction in the psychological impact score ($P < .001$). However, this group had significantly higher scores on the esthetic concern subscale after 6 months of treatment ($P < .001$).

DISCUSSION

In the present study, significant reductions were found in the psychosocial impact on young adults after 6 months of using a fixed orthodontic appliance. These findings are in agreement with data reported in previous studies addressing OHRQoL among young adults[9] and adolescents.[12] A recent study conducted in England found that orthodontic treatment with a fixed appliance had a negative impact on the OHRQoL of adults during the first 3 months of usage, with a tendency toward a reduction in scores after 6 months of treatment and a return to pretreatment scores only at the end of treatment.[10]

The divergence in the results may be explained by different OHRQoL assessment measures employed. The cited study evaluated OHRQoL using the Oral Health Impact Profile (OHIP-14), while the present investigation used the PIDAQ. Brazilian adolescents aged 11 to 14 reported better OHRQoL after 4 and 12 months of using a fixed appliances compared with the pretreatment evaluation; the improvement in quality of life was found mainly with regard to emotional and social well-being.[12] However, evaluating a control

Table 2. Impact on Quality of Life Before and During Orthodontic Treatment

	Median	Minimum	Maximum	Wilcoxon's Rank Test
Dental self-confidence				
Treated group				
Baseline	9.00	1.00	17.00	
After 6 mo	5.00	1.00	12.00	<.001*
Control group				
Baseline	6.00	1.00	16.00	
After 6 mo	5.50	1.00	12.00	.025*
Social impact				
Treated group				
Baseline	13.00	4.00	28.00	
After 6 mo	10.00	2.00	21.00	.043*
Control group				
Baseline	9.00	3.00	17.00	
After 6 mo	8.00	4.00	17.00	.007*
Psychological impact				
Treated group				
Baseline	8.00	2.00	20.00	
After 6 mo	6.50	1.00	18.00	<.001*
Control group				
Baseline	5.00	1.00	14.00	
After 6 mo	5.50	1.00	13.00	.890
Esthetic concern				
Treated group				
Baseline	3.00	0	8.00	
After 6 mo	6.00	2.00	12.00	<.001*
Control group				
Baseline	4.50	0	9.00	
After 6 mo	4.00	0	10.00	.337
Overall				
Treated group				
Baseline	33.50	12.00	67.00	
After 6 mo	28.50	11.00	53.00	.003*
Control group				
Baseline	25.00	12.00	49.00	
After 6 mo	24.00	10.00	43.00	.004*

* $P \leq .05$.

group not yet submitted to treatment is necessary in prospective studies so that the OHRQoL outcome can be attributed solely to treatment.

The control group scores in the present study raise questions on the improvement in OHRQoL during and after orthodontic treatment, especially with regard to social impact and dental self-confidence. The time lapse between prospective evaluations might constitute a source of bias in the findings of studies that do not include a control group. To minimize this and other limitations, we included a previous study involving Brazilian adolescents that found an improvement in the perception of esthetics after 1 and 2 years of using fixed appliances, whereas the control group composed of individuals waiting for orthodontic treatment reported a worsening of their dental esthetics perception.[16] These results are in accordance with our findings on esthetics, since an increase in the score of this subscale was found in the experimental group after 6 months of fixed appliances and did not occur in the control group. The divergence between the studies might be attributed to the age of the analyzed group. It is likely that young adults feel displeased with the effect of a fixed appliance on esthetics. Moreover, the period between evaluations was 6 months in our study, whereas Feu et al.[3] performed evaluations at 1 and 2 years when orthodontic correction is more advanced. Indeed, a proper patient-orthodontist relationship can contribute to the success of treatment and the recognition of the results by young adult patients during treatment.[17]

Although the patients reported greater esthetic impact after 6 months of treatment using a fixed appliance, they also reported significant reductions in psychological impact. In contrast, no change in psychological impact occurred in the control group. The former finding might be explained by the use of braces, which among young adults can cause dissatisfaction with one's dentofacial appearance. However, the reduction in psychological impact may be based on the expectations of treated individuals in relation to the correction of their malocclusion.[10]

The present study has limitations that should be addressed. The follow-up period was only 6 months. However, a longer follow-up period for an untreated control group would have been difficult and could have raised ethical concerns. In addition, it is possible that the variability in options of answers in OHRQoL might have caused difficulties for participants in choosing one of them. However, the instrument used in this study has had its validity demonstrated in several countries.[18–20] Future studies should minimize those limitations and should also evaluate the association between clinical parameters such as changes in tooth position and OHRQoL.

CONCLUSIONS

- The first 6 months of orthodontic treatment seem to improve the psychosocial impact of malocclusion.
- The patients analyzed in the present study reported a greater esthetic impact and less psychological impact after 6 months of using an orthodontic appliance.

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