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ORIGINAL ARTICLE

Do Different Orthodontic Malocclusions Affect Patients' Self-Concept and Psychosocial Status?

Serpil Çokakoğlu[1], Ruhi Nalçacı[2], Evrim Aktepe[3], Gökhan Özyer[4]

[1]Department of Orthodontics, Süleyman Demirel University School of Dentistry, Isparta, Turkey
[2]Department of Orthodontics, Karadeniz Technical University School of Dentistry, Trabzon, Turkey
[3]Department of Child and Adolescent Psychiatry, Süleyman Demirel University School of Medicine, Isparta, Turkey
[4]Ataşehir Oral and Dental Health Hospital, İstanbul, Turkey

ABSTRACT

Objective: The aim of this study was to evaluate the self-concept and psychosocial status measured by the levels of social phobia and loneliness in a sample of adolescent patients with different malocclusions and to explain the relationships, if any, between malocclusions.

Methods: This study was performed on 90 (41 females and 49 males) orthodontic patients with a mean age of 13.52±1.81 years. The patients were divided into three groups (Class I, Class II, and Class III) according to the different types of malocclusions. Piers–Harris Children's Self-Concept Scale (PHCSCS) was used to determine the self-concepts of patients. In addition, the levels of social phobia and loneliness were measured by Capa Social Phobia Scale for Children and Adolescents (CSPSCA) and University of California Los Angeles (UCLA) Loneliness Inventory, respectively. Data were analyzed statistically. The self-concept, social phobia, and loneliness scores of each group were compared using two-way analysis of variance (ANOVA) and Tukey's post hoc test.

Results: Self-concept scores did not significantly differ between the groups, except for the popularity subscale. Patients with Class II malocclusion had the lowest popularity scores. No significant differences were found between the levels of social phobia and loneliness among groups ($p>0.05$).

Conclusion: Our findings demonstrated that different malocclusions do not affect patients' self-concept and psychosocial well-being.

Keywords: Malocclusion, Piers-Harris, self-concept, loneliness, social phobia

INTRODUCTION

The appearance of the face and teeth plays an important role in an individual's whole adaptation to life (1). Minimizing the psychosocial problems related to dentofacial appearance seems to be the major reason for orthodontic treatment (2).

A positive relationship has been reported between facial attractiveness and interpersonal popularity, in addition to others' affirmative evaluations of personality, social attitudes, and intellectual status (3). However, facial attractiveness of children and adolescents has been evaluated by peers or teachers as being positively associated with grade point average, friendliness, and social relationships (4).

An individual's perception level of attractiveness or positive expressions toward the dentofacial region is more strongly related to self-concept (5). Self-concept or self-perception can be defined as how an individual perceives himself or herself or an individual's description of the profile. Moreover, self-concept has three different components: self-image, self-esteem, and ideal self (6).

Although it is generally assumed that the improvement in an individual's dentofacial appearance would have a positive effect on self-concept, there is little evidence supporting that the idea of the lack of malocclusion is related to a measurably higher self-esteem and life satisfaction (7).

On the other hand, a lower self-concept in children and adolescents is related to anxiety disorder known as social phobia (8) that typically has onset in an early to mid adolescence, between 10 and 17 years of age (9). In the liter-

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Corresponding Author: Dr. Serpil Çokakoğlu, Department of Orthodontics, Süleyman Demirel University School of Dentistry, Isparta, Turkey E-mail: serpil_cokakoglu@hotmail.com

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ature, it has been demonstrated that orthodontic problems have a significant influence over patients' social phobia and self-esteem (10). A higher degree of dental malocclusion is associated with higher social phobia and lower self-esteem (11). Similarly, a more negative self-concept, possibly lesser adjustment, and greater self-focus have been associated with loneliness (12).

Considering the orthodontists' perspectives, early treatment for the correction of visible aspects of malocclusion at an early stage of patients' maturation is recommended to prevent the development of poor self-concept and self-esteem and increase social acceptance (13).

Although numerous statements in the literature support the importance of psychological aspects of malocclusion (2-5,10-13), the relationship between malocclusion and psychosocial well-being is an intriguing issue that needs to be considered. In this study, we aimed to investigate the influence of different types of malocclusions on self-concept, loneliness, and social phobia in a sample of orthodontic patients. This study was performed on the basis of the hypothesis that patients with different types of malocclusions have significant differences between the levels of self-concept, loneliness, and social phobia.

METHODS

This study was performed on 90 patients (41 females and 49 males) referred to the Department of Orthodontics, Süleyman Demirel University School of Dentistry between September 2012 and March 2013 for orthodontic treatment. This research was performed according to the principles of the World Medical Association Declaration of Helsinki. Patients aged from 10 to 17 years (mean age, 13.52±1.81 years) scheduled for initial diagnostic records consented to participate. A verbal consent was obtained from all participants. The descriptive data of the patients are demonstrated in Table 1; the majority of patients were male (54%).

Patients with a craniofacial or congenital deformity or a systemic disorder that may affect physical or emotional growth were excluded from the study. The patients were assigned to three groups according the different types of malocclusions:

- Class I group: orthognathic soft tissue profile; positive overjet (≤3 mm); Angle Class I molar relationship
- Class II group: convex soft tissue profile; excessive overjet (>3 mm); Angle Class II molar relationship
- Class III group: concave soft tissue profile; negative overjet (<0 mm) Angle Class III molar relationship

In this study Piers–Harris Children's Self-Concept Scale (PHCSCS) was used to determine the total and subscale mean self-concept scores of the patients. In addition, the levels of social phobia and loneliness were measured by Capa Social Phobia Scale for Children and Adolescents (CSPSCA) and University of California Los Angeles (UCLA) Loneliness Inventory. The patients completed these questionnaires independently.

Piers-Harris Children's Self Concept Scale

Piers-Harris Children's Self Concept Scale provides an overall evaluation of an individual's self-perception. This scale includes six different subscales: (1) behavior, (2) intellectual and school status, (3) physical appearance and attributes, (4) anxiety, (5) popularity, and (6) happiness and satisfaction. This test includes 80 descriptive items, and each item requires "yes" or "no" answers depending on whether the statement applies to the patient. It has a total score that assesses a child's global self-concept and six cluster scores that measure various components of self-concept. Higher scores indicate a more positive self-evaluation (14).

Capa Scoial Phobia Scale for Children and Adolescents

Capa Scoial Phobia Scale for Children and Adolescents was developed by Demir et al. (15) for the evaluation of social phobia in children and adolescents. This scale includes 25 self-report items, each of which is rated on a 5-point scale ranging from "1/never" to "5/almost always". Higher scores indicate more social phobia. The reliability and validity study of this scale for the Turkish population have been performed by Demir et al. (15).

University of California Los Angeles Loneliness Inventory

The original scale was introduced by Russel et al. (16), and the Turkish version introduced by Demir (17) was used in this study. This scale gives information about an individual's feelings of loneliness and social isolation (16).

This scale consists of 20 items; half of them explain satisfaction with social relationships and the other half reflect dissatisfaction. The items that explain positive expressions are scored as "1/I often feel this way", "2/I sometimes feel this way", "3/I rarely feel this way", and "4/I never feel this way". On the other hand, the items that explain negative expressions are scored in an exactly opposite way as "1/I never feel this way", "2/I rarely feel this way", "3/I sometimes feel this way", and "4/I often feel this way". The scores of the scale change between 20 and 80. High scores indicate high loneliness.

Statistical Analysis

Power analysis (G*Power; version 3.0.10, Franz Faul, Kiel, Germany) indicated that a total sample size of 90 patients would give more than 95% power at α=0.05 level of significance with a size effect of 0.4243. The results were statistically analyzed by Statistical Package for the Social Sciences version 17.0 (SPSS Inc.; Chicago, IL, USA). The Kolmogorov–Smirnov test was applied to test for normal distribution. The data were found to be normally distributed, and there was homogeneity of variance among the groups. Two-way analysis of variance (ANOVA) and post-hoc Tukey's tests were used to compare results among the groups. The chi-square and independent sample t-test were used to analyze the results gender and age comparison. All the tests were performed with a significance level of $p<0.05$.

RESULTS

According to the descriptive statistics, no gender differences were found among the groups. However, there were significant age differences. The mean ages of the patients in the Class III group were the lowest among the groups. There were statistically significant differences between the Class I and Class III groups, as shown in Table 1.

The total mean self-concept scores and standard deviations for the three groups are shown in Table 2. Patients with Class III malocclusion scored lower than those in the other two groups. However, the patients' total mean self-concept scores evaluated between the different malocclusions did not reveal any significant differences ($p>0.05$) (Table 2).

According to the Piers–Harris subscales, no significant differences were found between the mean scores among the differ-

ent malocclusions, except for popularity (Table 3). Patients with Class II malocclusion showed the lowest scores, and the differences were significant (p=0.04, p<0.05).

The comparisons of social phobia and loneliness mean scores among the groups are shown in Table 4. The lowest social phobia mean score was found in the Class I group and the highest was found in in the Class III group. However, the differences between the groups were not significant (p>0.05). With regard to the results of loneliness mean scores, the lowest mean score was found in the Class I group and the highest was found in the Class III group. No significant differences were found between the groups. The comparisons of PHCSCS, UCLA, and CSPSCA total mean scores between the females and males showed no significant differences (Table 5). Based on our results, most parts of the null hypothesis that patients with different types of malocclusions have significant differences between the levels of self-concept, loneliness, and social phobia were rejected.

Table 1. Distribution of gender and average age (years) of the groups and statistical comparisons related to malocclusion groups

Malocclusion	n	Female n (%)	Male n (%)	p*	Mean age±SD (Range)	p**
Class I	30	15 (50)	15(50)	0.84	14.30±1.64[a] (11-17)	0.03*
Class II	30	13 (43)	17 (57)		13.37±1.73[a,b] (11-17)	
Class III	30	13 (43)	17 (57)		12.90±1.87[b] (10-17)	
Total	90	41(46)	49(54)		13.52±1.81 (10-17)	

SD: standard deviation; same letters show no significant differences
*χ^2 significance level.
**t-test significance level.

Table 2. Comparisons of PHCSCS total scores among groups

Malocclusion	Mean±SD	Min-Max	p
Class I	64.20±5.71	52-73	0.78
Class II	64.00±8.87	49-77	
Class III	62.13±8.12	41-74	

PHCSCS: Piers-Harris Children's Self Concept Scale; SD: standard deviation
p>0.05

Table 3. Comparisons of Piers–Harris self-concept subscales between groups

	Class I Mean±SD (Min-Max)	Class II Mean±SD (Min-Max)	Class III Mean±SD Min-Max)	p
Happiness	11.03±1.45 (7-13)	10.97±2.25 (4-13)	10.43±2.18 (3-13)	0.25
Anxiety	8.5±2.53 (5-13)	8.17±2.75 (4-13)	7.57±2.40 (1-12)	0.31
Popularity	10.33±1.03[a] (7-12)	9.27±1.84[b] (5-11)	9.67±1.52[ab] (6-11)	0.04*
Behavior	12.43±2.37 (7-16)	13.13±2.31 (7-16)	12.33±2.09 (7-15)	0.06
Appearance	7.60±1.89 (2-10)	7.27±2.30 (4-10)	7.67±2.06 (3-10)	0.42
Mental state	5.23±1.48 (1-7)	5.50±1.17 (3-7)	5.27±1.46 (2-7)	0.43

SD: standard deviation; same letters show no significant differences
*significant at the 0.05 level

DISCUSSION

Malocclusion can be considered not only as an oral health problem but also as being related to the general quality of life, despite the fact that the relationship between psychosocial well-being and malocclusions is still unclear (18).

Although previous studies aimed to evaluate the effects of the different characteristics of malocclusion such as large overjet, anterior crowding, and lip protrusion that are detectable by a lay person on psychosocial implications (19,20), we classified groups of malocclusions according to the soft tissue profile and Angle's classification, as is generally done. Klima et al. (21) initially investigated the characterization and differentiation of the self-concept and body image of orthodontic patients with different degrees or types of malocclusions and tried to add a new dimension to the definition of malocclusion. In their study, the distribution of patients in each malocclusion groups was not homogeneous. Subsequently, Centofante et al. (22) aimed to relate self-concept to normal and abnormal occlusions and found that anterior malocclusion reduces self-concept. On the other hand, Rivera et al. (23) concluded that patients with malocclusion commonly report a positive self-concept and body images that is comparable with the general population presents as similar.

In this study, a larger sample size and homogeneity of study groups were taken into consideration in order to eliminate the limitations of previous studies.

Consistent with the findings of our study, Dann et al. (24) reported that the differences between the total and subscale mean self-concept scores for Class II patients were not significant, but the only significance was the mean subscale score of a child's belief about his or her popularity in this malocclusion. When viewed from this aspect, Class II patients appeared to be suffering from being unpopular between classmates and described themselves as not being chosen for games and being unable to make friends. However, this situation had no negative effect on the level of total self-concepts of Class II patients.

In contrast to our results, Klima et al. (21) stated that patients with Class III malocclusion have significantly lower self-concept scores than those with other malocclusions. However, in their study, the sample size of Class III malocclusion was inadequate and only four patients were included. These investigators suggested differenti-

Table 4. Comparisons of CSPSCA and UCLA mean scores between groups

	CSPSCA			UCLA		
Malocclu-sion	Mean±SD	Min–Max	p	Mean±SD	Min-Max	p
Class I	48.80±15.27	25–83	0.16	49.57±6.38	36–63	0.48
Class II	49.23±14.99	27–78		50.50±5.29	41–62	
Class III	51.87±11.18	28–74		51.80±7.82	26–66	

CSPSCA: Capa Scoial Phobia Scale for Children and Adolescents; UCLA: University of California Los Angeles; SD: standard deviation
p>0.05

Table 5. Comparisons of PHCSCS, UCLA, and CSPSCA total mean scores between females and males

	Female	Male	
	Mean±SD (Min-Max)	Mean±SD (Min-Max)	p
PHCSCS	62.20±1.23 (41-77)	64.49±1.05 (46-77)	0.14
UCLA	49.12±0.97 (26-59)	51.88±0.95 (36-66)	0.06
CSPSCA	47.20±1.90 (27-73)	52.29±2.12 (25-83)	0.09

PHCSCS: Piers-Harris Children's Self Concept Scale; UCLA: University of California Los Angeles; CSPSCA: Capa Scoial Phobia Scale for Children and Adolescents; SD: standard deviation
p>0.05

ating the psychological impact of this type of malocclusion in a further study because of the significant differences (21). It was because of the fact that social phobia and loneliness were important components of the assessment of the psychosocial ill being; the psychosocial status of patients was determined by measurements of these variables in different malocclusion groups.

In accordance with the anxiety subscale of the self-concept, the patients with Class III malocclusion were found to be more social phobic than the other patients, although the magnitude of the difference was not significant. In contrast to our results, Dsouza et al. (10) reported that lower self-esteem and high social phobia scores are obtained in patients with Class III malocclusion than in those with Class II and Class I malocclusions. According to our knowledge, no studies have been published regarding the measurement of the level of loneliness in orthodontic patients. Therefore, the loneliness scores could not be compared precisely with those of other studies.

In this study, no association was found between total self-concept, loneliness, and social phobia scores and the gender of patients. Previous studies have shown that malocclusion causes more anxiety in women than in men (19,20) or has different psychosocial impacts between genders in the perceptions of facial and dental appearance. The results of this study rejected these findings.

CONCLUSION

With the limitation of this study, different orthodontic malocclusions had no negative effects on patients' self-concept and psychosocial status. Similarly, gender differences did not affect the psychosocial well-being. Future studies should be conducted with more patients using detailed profile and face analysis procedures.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Verbal consent was obtained from all patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - R.N., E.A.; Design - R.N., E.A.; Supervision - R.N.; Resource - R.N.; Materials - G.Ö.; Data Collection and/or Processing - G.Ö., S.Ç.; Analysis and/or Interpretation - R.N., E.A., G.Ö., S.Ç.; Literature Search - R.N., E.A., G.Ö., S.,Ç; Writing - R.N., E.A., G.Ö., S.Ç.; Critical Reviews - R.N., E.A., G.Ö., S.Ç.

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