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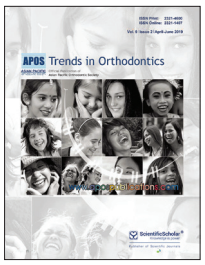

Original Article

Relationship of psychosociocultural factors with dental malocclusion and facial appearance

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ABSTRACT

Objectives: The purpose of this study was to evaluate the relationship between psychosociocultural factors and dental malocclusion, facial appearance, and body perception.

Material and Methods: The study was carried out with the participation of 112 female and 113 male individuals between the ages of 18 and 25. Individuals were asked to answer the Rosenberg Self-Esteem Scale, Physical Appearance Comparison Scale Revised, and Sociocultural Attitudes Towards Appearance Questionnaire 4-Revised questionnaires. Individuals were divided into three groups Class I, Class II, and Class III according to dental molar relationships. Standard facial and profile photographs of individuals in all groups were taken and soft-tissue measurements were performed.

Results: There was no significant psychosociocultural difference between male and female individuals. However, individuals with Class III dental malocclusion compare their physical appearance more than other malocclusion groups and more experience body dissatisfaction ($P > 0.05$). Individuals with Class III dental malocclusion have higher lower face height, lower lip height, mentolabial angle, facial convexity angle, total facial convexity angle values, and lower forehead height/lower face height, nose height/lower face height ratio, and projection of the upper lip relative to the chin. Individuals with Class II dental malocclusion have lower chin height and anterior mandibular height/lower face height ratio, higher upper lip height/lower face height ratio, and upper lip height/anterior mandibular height ratio. Individuals with Class I dental malocclusion have a lower upper face height/lower face height ratio.

Conclusion: Dental malocclusion groups have different facial soft tissue properties. Dental malocclusion and the facial appearance of individuals affect their lives in terms of psychosociocultural aspects.

Keywords: Dental malocclusion, Physical appearance, Soft-tissue analysis, Questionnaire

INTRODUCTION

Physical appearance has had an important role in human life for centuries from the past to present. Different physical appearances have become more important in social environments. People want to look beautiful and leave good impressions on others, both in their business and social lives.[1,2] Thoughts about appearance may differ according to the time lived and the cultural values of the society. Physical attractiveness standards are increasingly formed over time in society. While it is important for women to be thin and men to be muscular, gender standards are developing according to weight and body shape.[3]

The orofacial region is an important area of interest for humans. The value of the appearance of the teeth is increasing with the importance given to esthetics, and as a result, there is an increase

in people's requests for orthodontic treatment. People in need of orthodontic treatment are often more interested in improving their appearance and social acceptability than in improving their oral health or fulfilling their functional needs.[4]

One of the most important steps in orthodontic diagnosis and treatment planning is the evaluation of the patient's facial soft tissues. Since the shape of the human face depends on both the structure of the hard tissue and the soft tissue covering it from the outside, a soft-tissue analysis should be performed to accurately assess the underlying skeletal incompatibility due to individual differences in soft-tissue thickness.

Facial soft-tissue analysis was performed using several methods such as direct anthropometry, two-dimensional photogrammetry, and three-dimensional methods such as laser scan and scanning digital 3D photogrammetry.[5-8] Photogrammetry has been introduced as an alternative to direct measurements to determine distances between facial landmarks using both two- and three-dimensional methods.

This study aimed to evaluate the relationship between psychosociocultural factors and dental malocclusion, facial appearance, and body perception.

MATERIAL AND METHODS

This study was performed with the participation of 112 female and 113 male individuals between the ages of 18 and 25 who applied to Ordu University Faculty of Dentistry Department of Orthodontics for orthodontic treatment. Individuals with previous orthodontic treatment, cleft lip, palate, or syndromic disease, and a history of trauma were excluded from the study. This study was approved by the Clinical Research Ethics Committee of Ordu University (44/2021, date: April 18, 2021).

The patients answered the questions of the Rosenberg Self-Esteem Scale (RSE),[9] Physical Appearance Comparison Scale-Revised, and[10] Sociocultural Attitudes Towards Appearance Questionnaire 4-Revised.[11] According to molar bite relationships, patients were divided into three groups Class I, Class II, and Class III. There were 38 male and 38 female patients in the Class I malocclusion group. There were 37 male and 41 female patients in the Class II malocclusion group, and there were 38 male and 33 female patients in the Class III malocclusion group. Extraoral facial and profile photographic records were taken from the patients. The patients were seated in a chair and were asked to hold a 30-cm scale at cheek level when taking the front photo, and at the nose level when taking the profile photo. The photographs were taken with the patient sitting upright lips touching each other without straining in a natural head position.

The images were digitized, 13 linear measurements were performed on the frontal photographs, and 14 angular measurements were made on the profile photographs with the help of the software program (FACAD-trial version 3.8.4.2-Ilexis AB, Linkoping, Sweden). The measurements performed on the frontal photographs are shown in [Figure 1], and the measurements made on the profile photographs are shown in [Figures 2 and 3].

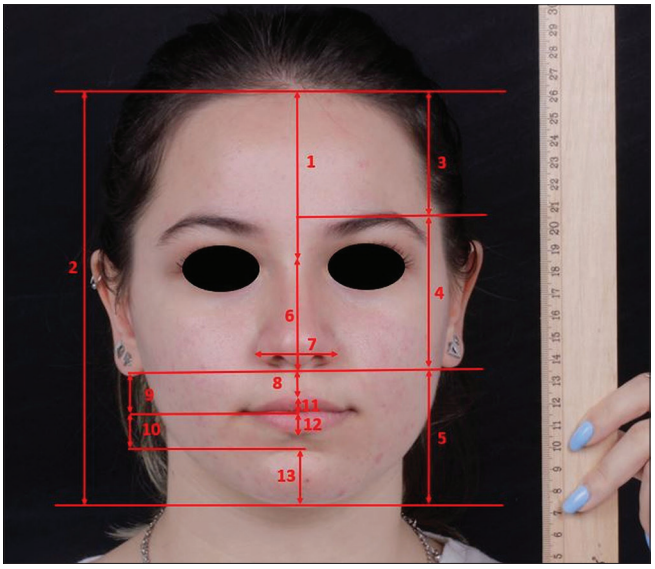

Figure 1: Linear measurements on facial frontal photographs: 1. Forehead height, 2. Physionomic face height, 3. Upper face trio, 4. Mid-face trio, 5. Lower face trio, 6. Nose height, 7. Nose width, 8. Filtrum length, 9.Upper lip height, 10. Height of lower lip, 11. Height of upper vermilion, 12. Height of lower vermilion, and 13. Height of chin.

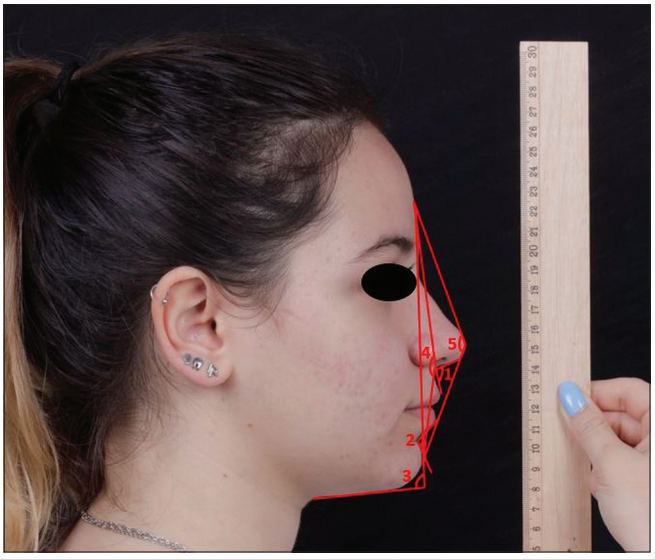

Figure 2: Angular measurements on facial profile photographs: 1. Nasolabial angle, 2. Mentolabial angle, 3. Cervicomental angle, 4. Facial convexity angle, and 5. Total facial convexity angle.

Statistical Package for the Social Sciences 24.0 program (IBM Corp, Armonk, NY, USA) was used for statistical analysis. While evaluating the study data, an independent *t*-test was used for pair-wise group comparisons of normally distributed parameters in addition to descriptive statistical methods (Mean, standard deviation, median, frequency, ratio, minimum, and maximum). One-way analysis of variance was used in the comparison of three or more than three groups that are normally distributed. The *post hoc* least significant difference test was used. Significance assessment was performed at levels of $P < 0.01$ and $P < 0.05$.

RESULTS

There was no statistically significant difference in Rosenberg RSE, sociocultural Attitudes Towards Appearance Scale, and Physical Appearance Comparison Scales between genders ($P > 0.05$) [Table 1].

Rosenberg RSE values were found to be 4.50 ± 0.77, 4.58 ± 0.96, and 4.63 ± 0.83 for Class I, Class II, and Class III individuals, respectively, and there was no statistically significant difference between the groups ($P > 0.05$) [Table 2].

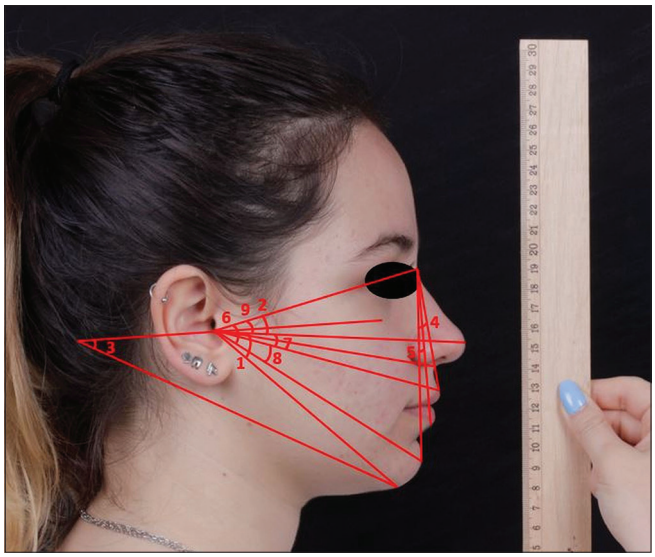

Figure 3: Angular measurements on facial profile photographs: 1. Lower face triple angle, 2. Midface triple angle, 3. Frankfurt mandibular plane angle, 4. Upper lip projection relative to the chin, 5. Lower lip projection relative to the chin, 6. Total vertical angle, 7. Maxillary angle, 8. Mandibular angle, and 9. Nasal angle.

Sociocultural Attitudes Towards Appearance scale values were found as 2.34 ± 0.50, 2.30 ± 0.53, 2.52 ± 0.58 for Class I, Class II, and Class III individuals, respectively. Sociocultural Attitudes Towards Appearance scale values in the Class III group are statistically significantly higher than the Class I and Class II groups ($P < 0.05$) [Table 2].

Physical Appearance Comparison Scale values were found as 3.66 ± 0.89, 3.88 ± 0.76, and 3.26 ± 0.85 for Class I, Class II, and Class III individuals, respectively. The Physical Appearance Comparison Scale values in the Class III group were statistically significantly lower than the Class I and Class II groups ($P < 0.05$) [Table 2].

When the mean and standard deviation values of men's and women's physiognomy face height, lower face triplet, nose width, philtrum height, upper lip height, lower lip height, upper vermilion height, lower vermilion height, and chin height were compared, there was a statistically significant difference in these measurements ($P < 0.05$) [Table 3].

There was no statistically significant difference between the groups in the frontal measurement values of forehead height, upper facial triad, midface triad, nose height, nasal width, philtrum length, upper lip height, upper vermilion height, and lower vermilion height values ($P > 0.05$) [Table 4].

Physiognomic face height values in the Class II malocclusion group were statistically significantly lower than that of the Class III malocclusion group ($P < 0.05$). The lower facial triad values in the Class III malocclusion group were statistically significantly higher than that of Class I and Class II malocclusion groups ($P < 0.05$). The chin height values in the Class II malocclusion group were statistically significantly lower than that of Class I and Class III malocclusion groups ($P < 0.05$) [Table 4].

When the mean and standard deviation values of mentolabial angle, cervicomental angle, midface triad angle, and nasal angle were compared in all genders; there was a statistically significant difference in all measurements ($P < 0.05$) [Table 5].

Nasolabial and cervicomental angle values in the Class II malocclusion group were statistically significantly higher

Table 1: Comparison of scales by gender.

Parameter	Male		Female		P^a-value
	Mean	SD	Mean	SD	
Rosenberg Self-Esteem Scale	4.56	0.90	4.58	0.82	0.842
Scale of sociocultural attitudes toward appearance	2.43	0.49	2.33	0.60	0.168
Physical Appearance Comparison Scale	3.59	0.78	3.63	0.96	0.688

SD: Standard deviation, P^a independent *t*-test significance value

Table 2: Comparison of scales by dental malocclusions.

Parameter	Class I		Class II		Class III		P^a-value	*Post hoc*[b]		
	Mean	SD	Mean	SD	Mean	SD		I-II	I-III	II-III
Rosenberg Self-Esteem Scale	4.50	0.77	4.58	0.96	4.63	0.83	0.639	NS*	NS*	NS*
Scale of Sociocultural Attitudes Towards Appearance	2.34	0.50	2.30	0.53	2.52	0.58	0.034	NS*	0.049	0.013
Physical Appearance Comparison Scale	3.66	0.89	3.88	0.76	3.26	0.85	0.001	NS*	0.004	0.001

SD: Standard deviation, P^a one-way analysis of variance significance value, P^b LSD parametric *Post hoc* significance value, NS: Statistically insignificant

Table 3: Comparison of facial frontal measurements by gender.

Parameter	Male		Female		P^a-value
	Mean	SD	Mean	SD	
Forehead height	66.70	6.55	68.36	6.44	0.057
Physiomic face height	191.50	8.10	184.54	9.92	0.001
Upper face triad	50.62	5.95	51.25	5.88	0.425
Mid face trio	70.09	4.27	70.39	4.15	0.590
Lower face triad	70.77	5.70	62.89	4.81	0.001
Nose height	54.03	2.97	53.29	2.88	0.059[a]
Nose width	38.85	2.89	35.13	2.33	0.001
Filter length	16.04	2.39	14.31	1.83	0.001
Upper lip height	22.33	2.56	20.21	2.14	0.001
Lower lip height	17.65	2.86	16.39	2.19	0.001
Upper vermilion height	6.30	1.55	5.90	1.24	0.037
Lower vermilion height	10.44	1.94	9.76	1.69	0.005
Chin height	30.78	4.01	26.29	2.87	0.001
Forehead height/upper face height ratio	87.59	9.85	93.07	8.15	0.001
Forehead height/lower face height ratio	95.00	13.05	109.16	12.05	0.001
Ratio of upper face height to lower face height	108.47	8.60	117.37	8.60	0.001
Nose height/lower face height ratio	76.89	8.21	85.21	7.97	0.001
Upper lip height/lower face height ratio	31.58	2.84	32.16	2.49	0.101
Anterior mandibular height/lower face height ratio	68.42	2.84	67.84	2.49	0.101
Upper lip height/anterior mandibular height ratio	46.40	6.11	47.60	5.45	0.120
Upper vermilion height/upper lip height ratio	28.29	6.57	29.19	5.33	0.264
Ratio of the upper vermilion height/lower vermilion height	61.05	13.46	61.11	11.06	0.970
Intercanthal width/nose width ratio	86.34	7.99	93.12	8.10	0.001
Ratio of face width to physiognomy face height	75.37	3.49	75.48	3.81	0.821

SD: Standard deviation, P^a independent-*t* test significance value

than in the Class III malocclusion group ($P < 0.05$). The mentolabial angle, facial convexity angle, and total facial convexity angle values in the Class III malocclusion group were statistically significantly higher than that of Class I and Class II malocclusion groups. Class I malocclusion group angle values are statistically significantly higher than Class II malocclusion group ($P < 0.05$). The projection values of the upper lip relative to the chin in the Class III malocclusion group were statistically significantly lower than the Class I and Class II malocclusion groups. The projection values of the upper lip relative to the chin in the Class I malocclusion group were statistically significantly lower than the Class II malocclusion group ($P < 0.05$) [Table 6].

DISCUSSION

From past to present, physical appearance is one of the issues that people of all ages and genders care about. The feeling of anxiety felt due to appearance affects self-esteem and perceptions of the person's appearance. According to the results of the study of Erman *et al.*,[12] in which the self-esteem of 100 university students was evaluated, no significant difference was found between gender. In the study of Yüceant[13] on 600 physical education teacher candidates, no significant difference was found between genders in terms of social appearance anxiety. In the study of Karazsia and Pieper[14] in which they evaluated body dissatisfaction, they found that all genders had body dissatisfaction at a similar

Table 4: Comparison of facial frontal measurements by dental malocclusions.

Parameter	Class I		Class II		Class III		P^a	Post hoc[b]		
	Mean	SD	Mean	SD	Mean	SD		I-II	I-III	II-III
Forehead height	68.48	6.06	67.19	7.12	66.87	6.32	0.284	NS*	NS*	NS*
Physiomic face height	188.48	9.66	185.94	9.70	189.85	9.38	0.042	0.103	0.384	0.014
upper face triad	51.99	5.34	50.76	6.56	50.01	5.65	0.120	NS*	NS*	NS*
mid face trio	70.01	4.10	70.41	4.06	70.31	4.51	0.833	NS*	NS*	NS*
lower face triad	66.46	6.46	64.78	5.90	69.53	6.57	0.001	0.100	0.004	0.001
nose height	53.52	3.01	53.97	2.85	53.46	2.98	0.502	NS*	NS*	NS*
Nose width	37.24	3.14	36.54	3.35	37.25	3.13	0.296	NS*	NS*	NS*
filter length	14.89	2.24	15.48	2.29	15.15	2.35	0.281	NS*	NS*	NS*
upper lip height	20.93	2.58	21.52	2.64	21.38	2.53	0.347	NS*	NS*	NS*
lower lip height	16.70	2.56	16.07	2.31	18.41	2.45	0.001	0.114	0.001	0.001
Upper vermilion height	6.03	1.34	6.05	1.45	6.22	1.46	0.683	NS*	NS*	NS*
Lower vermilion height	10.12	1.93	10.17	1.77	9.99	1.87	0.838	NS*	NS*	NS*
chin height	28.83	3.82	27.18	3.62	29.74	4.62	0.001	0.012	0.172	0.001
Forehead height/upper face height ratio	92.22	9.19	89.14	9.68	89.57	9.24	0.093	NS*	NS*	NS*
Forehead height/lower face height ratio	104.03	13.89	104.56	14.46	97.16	13.84	0.002	0.816	0.003	0.002
Ratio of upper face height to lower face height	112.69	8.48	117.29	9.71	108.30	8.69	0.001	0.002	0.003	0.001
Nose height/lower face height ratio	81.19	8.41	84.08	9.63	77.52	7.98	0.001	0.042	0.011	0.001
Upper lip height/lower face height ratio	31.50	2.35	33.21	2.46	30.78	2.65	0.001	0.001	0.082	0.001
Anterior mandibular height/lower face height ratio	68.50	2.35	66.79	2.46	69.22	2.65	0.001	0.001	0.083	0.001
Upper lip height/anterior mandibular height ratio	46.15	5.02	49.93	5.51	44.69	5.64	0.001	0.001	0.101	0.001
Upper vermilion height/upper lip height ratio	28.90	5.44	28.13	6.02	29.24	6.51	0.513	NS*	NS*	NS*
Ratio of upper vermilion height/lower vermilion height	60.25	10.87	60.12	13.15	63.02	12.70	0.275	NS*	NS*	NS*
Intercanthal width/nose width ratio	90.03	7.80	90.16	8.79	88.88	9.60	0.620	NS*	NS*	NS*
Ratio of face width to physiognomy face height	75.70	3.79	75.39	3.51	75.15	3.66	0.656	NS*	NS*	NS*

SD: Standard deviation, P^a one-way analysis of variance significance value, P^b LSD parametric *Post hoc* significance value, NS: Statistically insignificant

Table 5: Comparison of facial profile measurements by genders.

Parameter	Male		Female		P^a-value
	Mean	SD	Mean	SD	
Nasolabial angle	101.33	14.36	101.72	10.06	0.811
Mentolabial angle	127.04	14.66	131.64	13.74	0.016
Cervicomental angle	102.82	8.37	95.85	8.92	0.001
Facial convexity angle	167.23	6.73	166.05	6.34	0.177
Total facial convexity angle	141.01	5.92	140.33	9.54	0.519
Lower triad angle	34.33	3.26	34.83	2.84	0.225
Midface triad angle	28.45	2.11	29.16	1.89	0.008
Frankfurt mandibular plane angle	29.63	6.01	30.31	5.30	0.368
Projection of the upper lip relative to the chin	7.12	2.68	7.41	2.37	0.389
Projection of the lower lip relative to the chin	3.09	1.94	3.31	1.45	0.326
Total vertical angle	54.09	4.23	54.03	3.38	0.921
Maxillary angle	12.40	1.51	12.24	1.22	0.387
Mandibular angle	19.24	2.35	18.72	1.70	0.059
Nasal angle	22.44	1.90	23.07	1.71	0.010

SD: Standard deviation, P^a independent-*t* test significance value

rate. In our study, in the evaluations made according to the results of the Rosenberg RSE, the Sociocultural Attitudes Towards Appearance scale, and the Physical Appearance Comparison Scale, no significant psychosociocultural difference was found between men and women ($P > 0.05$).

Now in interpersonal interaction, the gaze focuses on the face, eyes, and teeth, especially since the teeth attract more attention, the dentofacial appearance is one of the important factors affecting attractiveness. The physical attractiveness of people with dentofacial deformities or dental disorders is lower than other people, and these people can be mocked and ostracized in the community or their group of friends.[15] Malocclusions negatively affect the psychology of people by causing the formation of functional and esthetic problems. Individuals who are not happy when they look in the mirror due to the appearance of their teeth say that they do not like themselves and cover their mouth with their hands while smiling, feel the need for orthodontic treatment to be better and happier.[16]

Kang and Kang,[17] in their study on 860 adult patients between the ages of 18 and 39 who needed orthodontic treatment, found that individuals were most affected by dental aesthetics psychosocially. Gerzanic *et al.*[18] showed in their study that 100 patients with Class II and Class III

Table 6: Comparison of facial profile measurements by dental malocclusions.

Parameter	Class I		Class II		Class III		P^a-value	Post hoc[b]		
	Mean	SD	Mean	SD	Mean	SD		I-II	I-III	II-III
Nasolabial angle	100.47	12.22	104.33	11.85	99.57	12.75	0.042	0.052	0.660	0.019
Mentolabial angle	129.27	12.34	122.82	15.72	136.55	11.18	0.001	0.003	0.001	0.001
Cervicomental angle	99.38	9.15	101.18	9.18	97.32	9.32	0.040	0.226	0.178	0.011
Facial convexity angle	167.06	5.05	162.07	5.52	171.22	5.63	0.001	0.001	0.001	0.001
Total facial convexity angle	141.63	10.38	136.45	5.07	144.29	4.77	0.001	0.001	0.027	0.001
Lower triad angle	34.24	2.98	34.98	3.36	34.49	2.78	0.316	NS*	NS*	NS*
Midface triad angle	28.77	2.10	29.03	1.98	28.58	2.01	0.393	NS*	NS*	NS*
Frankfurt mandibular plane angle	29.09	5.10	29.68	5.95	31.22	5.78	0.063	NS*	NS*	NS*
Projection of the upper lip relative to the chin	7.08	1.93	8.94	2.29	5.61	2.17	0.001	0.001	0.001	0.001
Projection of the lower lip relative to the chin	2.89	1.40	3.52	2.07	3.18	1.54	0.072	NS*	NS*	NS*
Total vertical angle	53.48	3.60	54.73	3.99	53.94	3.81	0.123	NS*	NS*	NS*
Maxillary angle	12.15	1.21	12.51	1.38	12.31	1.52	0.275	NS*	NS*	NS*
Mandibular angle	18.56	1.76	19.28	2.34	19.11	1.99	0.077	NS*	NS*	NS*
Nasal angle	22.79	1.88	22.93	1.78	22.53	1.83	0.395	NS*	NS*	NS*

SD: Standard deviation, P^a one-way analysis of variance significance value, P^b LSD parametric *Post hoc* significance value, NS: Statistically insignificant

malocclusions who needed orthognathic surgery felt significantly less attractive, gave more importance to their appearance, and felt less secure in terms of facial appearance before orthognathic surgery. According to the results of our study, individuals with Class III malocclusion compare their physical appearance with each other and experience appearance anxiety more than those with Class I and Class II malocclusions.

From the past to the present, facial photography has been a part of keeping orthodontic records both before and after the treatment. It has been stated that in cases where dentists do not have the opportunity to take cephalometric radiographs, photography gains even more importance and is an important diagnostic tool. Measuring from photographs is less inconvenient and less costly for the patient, allows for a recording of the face that can be accessed later, and provides consistency in studies that can be attended by different observers who want to use different measurement techniques.[19,20]

In the study of Topaloğlu,[21] in which 3dMD images of individuals were evaluated, lower face height was measured as 68.25 ± 5.55 mm in Class I patients, 67.78 ± 5.03 mm in Class II patients, and 70.36 ± 6.15 mm in Class III patients. Similarly, in our study, the lower face height of individuals with Class III malocclusion was found to be higher than those with Class I and Class II malocclusions. In our study, the width of the nose and the height of the upper lip were found to be 38.85 ± 2.89 mm and 22.33 ± 2.56 mm in men, 35.13 ± 2.33 mm and 20.21 ± 2.14 mm in women, respectively. Consistent with our study, Ozdemir *et al.*[22] measured the width of the nose and the height of the upper lip as 38.4 ± 0.44 mm and 21.6 ± 0.31 mm in men and 34.8 ± 0.29 mm and 9.4 ± 0.29 mm in women, respectively.

Fernández-Riveiro *et al.*[6] found the chin height as 29.09 ± 2.93 mm in men and 25.85 ± 2.48 mm in women, according to their study on photographs. In our study, the chin height was found to be 30.78 ± 4.01 mm in men and 26.29 ± 2.87 mm in women, which indicates that the chin height of men is more than that of women. Among the malocclusion groups, the chin height was statistically significantly lower in the Class II malocclusion group compared to the Class I and Class III malocclusion groups.

The nasolabial angle was found to be 101.33 ± 14.36 in men and 101.72 ± 10.06 in women, and the angle values show great variability. Therefore, measurement results should be interpreted with care. Nanda *et al.*[23] found the nasolabial angle as 108.15 ± 13.18 in men and 102.78 ± 14.01 in women using video recordings in their study with 50 people aged between 21 and 36. McNamara *et al.*[24] found the nasolabial angle as 102.2 ± 8 in men and 102.4 ± 8 in women in a study conducted with Caucasians using lateral cephalometric radiographs.

In our study, mentolabial angle values were found to be lower in males than females, similar to the study of Moshkelgosha *et al.*[25] (127.04 ± 14.66 in males and 131.64 ± 13.74 in females). Among the malocclusion groups, the mentolabial angle values in the Class III malocclusion group were statistically significantly higher than the Class I and Class II malocclusion groups.

Godt *et al.*[26] found the soft-tissue convexity angle to be 165.73 in Class I patients, 162.87 in Class II patients, and 172.97 in Class III patients, according to their study on the profile photographs of patients with different skeletal malocclusions. Similarly, in our study, facial convexity angle values in the Class III malocclusion group were statistically

significantly higher than in Class I and Class II malocclusion groups. The facial convexity angle values in the Class I malocclusion group were found to be statistically significantly higher than the Class II malocclusion group.

CONCLUSION

Class I, Class II, and Class III dental malocclusion individuals have the same level of self-esteem. Class III dental malocclusion individuals compare their physical appearance and experience appearance anxiety more than those with Class I and Class II dental malocclusions. Malocclusion groups have different facial soft-tissue features. The malocclusion and facial appearance of individuals affect their lives in terms of psychosociocultural aspects.

Ethical approval

This study was approved by the Clinical Research Ethics Committee of Ordu University (44/2021, date: April 18, 2021).

Authors contributions

SKB: Conceptualization; SH and SKB: Data curation; SH: Formal analysis; SH and SKB: Investigation; SH and SKB: Methodology, project administration, resources, software; SKB: supervision, validation, and visualization; SH and SKB: Roles/writing of original draft; SH and SKB: Writing-review and editing.

Declaration of patient consent

Institutional Review Board (IRB) permission was obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Ballı ÖM, Kirazcı S, Aşçı FH. Social physique anxiety and body image satisfaction levels of female athletes and non-athletes. Gazi J Phys Educ Sports Sci 2006;11:9-16.
2. Yousefi B, Hassani Z, Shokri O. Reliability and factor validity of the 7-item of social physique anxiety scale (SPAS-7) among university students in Iran. World J Sport Sci 2009;2:201-4.
3. Solomon M, Venuti J, Hodges J, Iannuzzelli J, Chambliss C. Educational Responses to Media Challenges to Self Esteem: Body Image Perceptions among Undergraduate Students. United States: Education Resources Information Center; 2001. p. 22.
4. Kiyak HA. Does orthodontic treatment affect patients' quality of life? J Dent Educ 2008;72:886-94.
5. Farkas LG, Katic MJ, Forrest CR, Alt KW, Bagič I, Baltadjiev G, *et al*. International anthropometric study of facial morphology in various ethnic groups/races. J Craniofac Surg 2005;16:615-46.
6. Fernández-Riveiro P, Suárez-Quintanilla D, Smyth-Chamosa E, Suárez-Cunqueiro M. Linear photogrammetric analysis of the soft tissue facial profile. Am J Orthod Dentofac Orthop 2002;122:59-66.
7. Sforza C, Laino A, D'Alessio R, Grandi G, Tartaglia GM, Ferrario VF. Soft-tissue facial characteristics of attractive and normal adolescent boys and girls. Angle Orthod 2008;78:799-807.
8. Baik HS, Jeon JM, Lee HJ. Facial soft-tissue analysis of Korean adults with normal occlusion using a 3-dimensional laser scanner. Am J Orthod Dentofac Orthop 2007;131:759-66.
9. Rosenberg M. Self Report Measures for Love and Compassion Research: Self-Esteem. Princeton, NJ: Princeton University Press; 1965.
10. Schaefer LM, Thompson JK. The development and validation of the physical appearance comparison scale-revised (PACS-R). Eat Behav 2014;15:209-17.
11. Schaefer LM, Harriger JA, Heinberg LJ, Soderberg T, Thompson JK. Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). Int J Eat Disord 2017;50:104-17.
12. Erman KA, Şahan A, Can S. Comparison of Self-Esteem Levels of the Males and Females who Played Sports. Vol. 8. Uluslararası Spor Bilimleri Kongresi; 2004.
13. Yuceant M. Examining the social appearance anxiety of candidate physical education teachers in terms of some variables. Master Thesis; 2013. p. 9-29.
14. Karazsia BT, Pieper K. A meta-analytic review of sociocultural influences on male body image. In: Body Image: Perceptions, Interpretations and Attitudes. Hauppauge: Nova Science Publishers; 2011. p. 153-71.
15. Heilman ME, Stopeck MH. Attractiveness and corporate success: Different causal attributions for males and females. J Appl Psychol 1985;70:379-88.
16. Guyer EC, Ellis EE 3rd, McNamara JA, Behrent RG. Components of Class III malocclusion in juveniles and adolescents. Angle Orthod 1986;56:7-30.
17. Kang JM, Kang KH. Effect of malocclusion or orthodontic treatment on oral health-related quality of life in adults. Korean J Orthod 2014;44:304-11.
18. Gerzanic L, Jagsch R, Watzke IM. Psychologic implications of orthognathic surgery in patients with skeletal Class II or class ill malocclusion. Int J Adult Orthodon Orthognath Surg 2002;17:75-81.
19. Graber TM. Orthodontics Principles and Practice. 3rd ed. Philadelphia, PA: W.B. Saunders; 1972. p. 397-431.
20. Proffit WM. Contemporary Orthodontics. St Louis: C.V. Mosby; 1986. p. 127-34.
21. Topaloglu A. Evaluation of the effect of skeletal sagittal malocclusions to smile with 3D face imaging method. Dentistry Speciality Thesis; 2020.
22. Ozdemir ST, Sigirli D, Ercan I, Cankur NS. Photographic facial soft tissue analysis of healthy Turkish young adults: Anthropometric measurements. Aesthetic Plast Surg

2009;33:175-84.
23. Nanda RS, Ghosh J, Bazakidou E. Three-dimensional facial analysis using a video imaging system. Angle Orthod 1996;66:181-8.
24. McNamara JA, Brust EW, Riolo ML. Soft tissue evaluation of individuals with an ideal occlusion and a well-balanced face. In: Esthet Treat Facial Form. Ann Arbor: University of Michigan Press; 1992. p. 115-46.
25. Moshkelgosha V, Fathinejad S, Pakizeh Z, Shamsa M, Golkari A. Photographic facial soft tissue analysis by means of linear and angular measurements in an adolescent persian population. Open Dent J 2015;9:346-56.
26. Godt A, Müller A, Kalwitzki M, Göz G. Angles of facial convexity in different skeletal classes. Eur J Orthod 2007;29:648-53.

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