

Research Paper: The effect of three different malocclusions on the quality of life of 12 to 14 years old students in Rasht in 2019



Seyedeh Fatemeh Masoumi Fakhabi¹ , Naghmeh Abdollahi^{2*} , Amin Fereshteh housh³

¹Dental Sciences Research Center, Department of Orthodontics, School of dentistry, Guilan University Of Medical Sciences, Rasht, Iran.

²Postgraduate Student of Orthodontics, Department of Orthodontics, School of dentistry, Guilan University of Medical Sciences, Rasht, Iran.

³Dentist

Use your device to scan
and read the article online



Citation: Masoumi Fakhabi SF, Abdollahi N, Fereshteh Housh A. The effect of three different malocclusions on the quality of life of 12 to 14 years old students in Rasht in 2019. Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2020; 9(3):7-12. <http://dx.doi.org/10.32598/3dj.7.4.145>



<http://3dj.gums.ac.ir>



ABSTRACT

Introduction: Malocclusion is a common oral disease that, in addition to damaging the functioning of the oral system and hygiene, can harm a person's social relationships and mood by negatively affecting their beauty and self-esteem and reduce the quality of life. Many malocclusions, if detected, can be corrected at the right time by spending less time and money, which plays a significant role in the quality of life.

Materials and Methods: In this applied research, 76 students in the range of 12 to 14 years old (39 girls and 37 boys) were evaluated in four groups. The first group consisted of individuals with normal overjet and $3 \leq$ mm anterior crowding. The second group consisted of less than 2 mm overjet and $3 \leq$ mm anterior spacing. The third group has $6 \leq$ mm overjet with crowding and $1 \geq$ mm spacing. The fourth group has a control group consisting of subjects with normal occlusion. To examine the effect of this malocclusions on quality of life, The Oral Health Related Quality of Life (OQLQ) questionnaire was used. For statically analyses Kolmogorov-Smirnov and Kruskal-Wallis test were used. The significance level in all tests was 0.05.

Results: The results showed that there was no statistically significant difference between the four groups in each domain (oral functioning, social aspect, dentofacial beauty and dentofacial beauty awareness). ($p > 0.05$).

Conclusion: Malocclusions such as anterior crowding, anterior spacing and increased overjet do not affect the quality of life of untreated 12-14 year old subjects.

Article info:

Received: 05 Sep 2020

Accepted: 25 Sep 2020

Keywords:

**Quality of Life,
Malocclusion,
Students**

* Corresponding Author:

Naghmeh Abdollahi

Address: Department of Orthodontics, School of dentistry, Guilan University of Medical Sciences, Rasht, Iran.

Tel: +98 9112841863

E-mail: naghmeh_abdollahi@yahoo.com

Introduction:

Malocclusion is a health problem and is the third most common oral disease after dental caries and gum disease (1). Due to its high prevalence, malocclusion is considered to be a public health problem that may adversely affect the quality of life of patients, hinder their social relationships, and affect their mental health (2). In orthodontics, Oral Health Related Quality Of Life (OHRQOL) seeks to address social or emotional concerns as well as any symptoms or functional problems from a patient's perspective (3).

OHRQOL is a patient-reported result that is used by questionnaires to measure the psychological impact of teeth on a person. Which indicates a multidimensional and individual understanding of oral health (4). The concept of OHRQOL in orthodontics is also used to determine the diversity in the need for treatment from a specialist and patient point of view (5,6). Oral health is essential for a good quality of life (7), as it may affect children's eating, smiling, talking, and socializing. The appearance of the face affects self-confidence and emotional health and plays an important role in social relationships. As a result, changes in these functions will affect the quality of life of children (8).

The effects of malocclusion and OHRQOL may be different in children than adults. Just as they are treated differently in a disease, they are treated differently in psychological, social, and emotional factors (9). Besides, OHRQOL activities for children and adults are different. Therefore, they should not be examined simultaneously (10).

Facial features that are most associated with physical attractiveness include the eyes and mouth. Since facial appearance plays an important role in building a good life, the appearance and position of teeth are factors that have greater psychological and social effects on children and young adults (11). Studies in the adult population generally state a relationship between malocclusion and the need for orthodontic treatment and OHRQOL scores (5,6).

Traditional occlusal indices, such as the Dental Beauty Index (DAI) and the Index of Orthodontic Treatment Need (IOTN), assess the aesthetic and anatomical components of malocclusion (12), but they don't provide any information on how the malocclusion affects the patient's self-image and quality of life in terms of mental health and daily functioning (13).

The OQLQ questionnaire was developed in 2000 as a tool for assessing the quality of life in patients treated with orthognathic surgery and was approved in 2002 by Cunningham et al. (14,15).

The reason for choosing this age group is, its importance in terms of timely diagnosis of the effect of dental-jaw abnormalities mentioned on the quality of life of adolescents and the emphasis on the need to treat these anomalies depending on the severity of the impact on their quality of life before adulthood. Also at this time, the mixed dentition stage is completed.

Due to the relatively high prevalence of malocclusions, such as increased overjet, anterior crowding and spacing, and importance of the effect of these malocclusions on the individual's quality of life, in this study, we decided to examine the effect of these three malocclusions on the quality of life of 12 to 14 year-olds individuals in Rasht.

Materials and methods:

After obtaining an official license from the Rasht Education Department, a list of girls 'and boys' schools in Rasht was prepared. After examining 12-14 year-olds students, 76 people (39 girls and 37 boys) from students in different regions of the city, Rasht was selected and students were asked to complete the OQLQ questionnaire. The selected individuals were divided into four groups based on the following characteristics:

- The first group consisted of individuals with normal overjet and $3 \leq$ mm anterior crowding.
- The second group consisted of less than 2 mm overjet and $3 \leq$ mm anterior spacing.

- The third group has $6 \leq$ mm overjet with crowding and $1 \geq$ mm spacing.
- The fourth group has a control group consisting of subjects with normal occlusion. In other words, people with 2-4 mm overjet, regular maxillary anterior teeth, class 1 occlusion, and with low irregularity and/or $1 \geq$ mm spacing were included.

People with the following characteristics were excluded from the study :

history of chronic medical disease - previous orthodontic treatment or ongoing treatment - severe dentofacial anomalies such as cleft lip and palate - acute untreated dental conditions that affect the quality of life, such as caries associated with pain and acute periodontitis with looseness and high inflammation of the supporting tissues, which were diagnosed through clinical and questioning. - Children with traumatic dental injuries or enamel developmental defects.

To measure the effect of oral problems on the quality of life of people ,the Orthognathic Quality Of Life (OQOL) questionnaire, which contains 22 specific questions and four different aspects of quality of life related to orthognathic conditions, was used. It contains the social aspect, the beauty of the dentofacial system, oral function, awareness of orofacial beauty (self-confidence). This questionnaire has been translated into Persian by using the standardized forward-backward method, Its validity (0/86) and reliability (0/91) have been confirmed in the study of Momeni et al (16).

Each of the questions in this questionnaire contains 5 (0,1,2,3,4) options according to Likert Scale coded, in which the number 0 indicates that the subject of the phrase never bothers you.1: slightly annoying.2: less annoying than average. 3 : It hurts more than average. 4: It hurts a lot.

To determine the sample size, considering 4 groups with averages of 11.13, 10.27, 13.43 and 2.38 and the statistical power is 0.96, the error level is 0.05 and the standard deviation obtained from previous studies is 8.34, the minimum sample size 19 person for each group

was obtained (17). During the data collection, the groups were not given detailed information about the main purpose of the questionnaire.

For statically analyses to evaluate the normality of the distribution of the studied groups, Kolmogorov-Smirnov test was used and for homogeneity of variance, Leven test was used. To examine the relationship and compare the groups the Kruskal-Wallis test and to compare the two groups in the analysis of variance from the Tukey test and in the Kruskal-Wallis test from the Mann-Whitney test with Bonferroni correction were used. The software used was SPSS version 26, the significance level in all tests was 0.05.

Results:

In this cross-sectional analytical study, 76 students (39 girls and 37 boys) aged 12 to 14 years old, were selected after oral examinations and divided into 4 groups , including one control group and three groups with malocclusion: crowding , spacing and overjet.

Each participant was given a 22-question questionnaire and then the answers were evaluated and analyzed. By using the Chi_square test, it was found that there was no significant statistical relationship between gender ($P = 0.7$) and age ($P = 0.345$) in the four groups with different types of malocclusions.

By using the Kolmogorov Smirnov test, it was determined that the scores obtained in the social domains, the beauty of the dentofacial system, the oral function, the awareness of the orofacial beauty of the OQOL questionnaire had a normal distribution in the four groups ($P < 0.05$).

According to the number of questions (8 questions) in the social domains of the OQOL questionnaire, the range of scores that obtained by the subjects between zero and 32.

According to the number of questions (5 questions) in the beauty of the dentofacial system of the OQOL questionnaire, the range of scores that can be obtained by the subjects will be between zero and 20. According to the number of questions (5 questions) in the field of oral function of the OQOL questionnaire, the

range of scores that can be obtained by the subjects will be between zero and 20. According to the number of questions (4 questions) in the awareness of the orofacial beauty of the OQOL questionnaire, the range of scores that can be obtained by the subjects will be between zero and 16.

By using the One Way ANOVA analysis of variance, in the OQOL questionnaire among the four groups of research subjects (anterior crowding, anterior spacing, overjet and normal occlusion) ($P = 0.052$).

By using the Post Hoc Tuckey test, in the OQOL questionnaire among the four groups of research subjects ($P > 0.05$), it was found that there was no statistically significant difference between the mean scores obtained in the social domains, the beauty of the dentofacial system, the oral function, the awareness of the orofacial beauty.

By using the Kolmogorov Smirnov test, it was determined that the scores obtained from the OQOL questionnaire had a normal distribution in the four study groups ($P < 0.05$).

By using the One Way ANOVA variance analysis test (Table 1), it was found that there was no statistically significant difference between the mean scores obtained from the OQOL questionnaire among the four groups ($P = 0/64$).

Table 1: Comparison of scores obtained from the OQOL questionnaire among 4 groups with anterior crowding, anterior spacing, overjet and normal occlusion

| | NUMBER | MEAN±SD | T H E AMOUNT OF THE TEST | STATISTI-CAL ESTI-MATES |
|-----------------------|--------|-------------|--------------------------|-------------------------|
| CROWDING | 19 | 15/52±17/44 | | |
| SPACING | 19 | 9/84±10/73 | | |
| OVERJET | 19 | 12/1±14/23 | F=0/55 | P=0/64 |
| N O R M A L OCCLUSION | 19 | 13/26±11/98 | | |

By using the Post Hoc Tukey test (Table 2), it was found that there was no statistically significant difference between the mean scores obtained from the OQOL questionnaire among each group with other groups ($P > 0/05$).

Table 2: review and comparison of average scores obtained from the OQOL questionnaire using the Post Hoc Tuckey test

| | Crowding | spacing | overjet | Normal occlusion |
|-----------------------|----------|---------|---------|------------------|
| crowding | **** | | | |
| spacing | P=0/587 | **** | | |
| overjet | P=0/871 | P=0/958 | **** | |
| N o r m a l occlusion | P=0/958 | P=0/871 | P=0/994 | **** |

Discussion:

Malocclusion is one of the factors that has a negative effect on the quality of life of people (18), but according to the results of our study, the quality of life of people studied in each of the three types of malocclusion and the control group did not differ. This is contrary to the results obtained from the study of Omolara et al (17), in their study, all three types of malocclusion had a negative effect on the quality of life compared to the control group. According to a study by Dacosta et al [19], spacing did not have a negative effect on the quality of life of individuals compared to the control group, which is similar to the results of our study.

In some societies, the presence of space between the front teeth has been accepted as a natural beauty (17), which needs further study in our society. In a study by Anosike et al (20) on 12 to 16 years old individuals, although 41.3% of them had an urgent need for orthodontic treatment (according to the DAI index), 85.3% of the population surveyed did not feel the impact on their quality of life. Also, in the study of Kolawole et al (21), malocclusion did not affect the quality of life of individuals, which is consistent with the results of our study.

In our study, people with a history of orthodontic or treated treatment were excluded from the study, and it can be concluded that people who were more concerned and whose quality of life was affected sought treatment. Therefore, malocclusion hasn't affected the quality of life in other remaining people who were examined in our study.

These different results may also be due to the fact that studies have been conducted in differ-

ent communities and the extent of the effect of malocclusion on the quality of life in different communities is different.

In various studies, some types of malocclusion had a more negative effect on self-esteem, people were more shy and worried about being treated negatively by others. In the study by Omolara et al (17), increased overjet had a more negative effect on self-esteem than crowding and anterior spacing, and the subjects surveyed were shyer, which is different from the results of our study.

A study by Hassan et al (22), found that malocclusion had a negative effect on eating. In the study by Omolara et al (17), people with crowding had more difficulty in receiving food, but in our study, the groups surveyed had no problem with this.

In some studies (20,23-25), girls and older children with malocclusion had worse quality of life, but in our study, there was no difference between girls and boys, as well as between different ages. The lack of differences in different ages in our study may be related to the low age range studied (12 to 14 years) as well as the different age of social development and etc.. in the studied groups.

According to the results of a recent study, since malocclusions such as overjet and crowding and anterior spacing don't affect the quality of life of 12 to 14 years old, they do not seek orthodontic treatment but at older ages, they may change their minds and lose the golden time to treat many of these malocclusions. Besides, more complex orthodontic treatments may be needed with or without maxillofacial surgery, which can sometimes increase the time, cost, and complexity of treatment. Therefore, there is a need to develop appropriate programs to increase the awareness of children and their families, as well as screening people with malocclusion at the right time to reduce the cost, time and complexity of treatment of these people and reduce the negative effects on their quality of life at older ages.

Conclusion :

With considering the limitations of this study, anterior crowding, anterior spacing and Severe overjet doesn't affect the quality of life of untreated 12 to 14 years old. Also there isn't difference between the four groups examined in terms of the effect of oral condition on quality of life.

Acknowledgement

None

Conflicts of interest

There are no conflicts of interest

Reference:

1. Suliano, A.A., et al., Prevalência de malocclusão e sua associação com alterações funcionais do sistema estomatognático entre escolares. Cadernos de Saúde Pública, 2007. 23: p. 1913-1923. <https://doi.org/10.1590/S0102-311X2007000800018>
2. Marques, L.S., et al., Malocclusion: esthetic impact and quality of life among Brazilian schoolchildren. American journal of orthodontics and dentofacial orthopedics, 2006. 129(3): p. 424-427. <https://doi.org/10.1016/j.ajodo.2005.11.003>
3. Locker, D. and F. Allen, What do measures of 'oral health-related quality of life' measure? Community dentistry and oral epidemiology, 2007. 35(6): p. 401-411. <https://doi.org/10.1111/j.1600-0528.2007.00418.x>
4. Sicho, L. and H. Broder, Oral health-related quality of life: what, why, how, and future implications. Journal of dental research, 2011. 90(11): p. 1264-1270. <https://doi.org/10.1177/0022034511399918>
5. Liu, Z., C. McGrath, and U. Hägg, The impact of malocclusion/orthodontic treatment need on the quality of life: a systematic review. The Angle Orthodontist, 2009. 79(3): p. 585-591. <https://doi.org/10.2319/042108-224.1>
6. Zhang, M., C. McGrath, and U. Hägg, The impact of malocclusion and its treatment on quality of life: a literature review. International journal of paediatric dentistry, 2006. 16(6): p. 381-387. <https://doi.org/10.1111/j.1365-263X.2006.00768.x>
7. Tesch, F.C., B.H.d. Oliveira, and A. Leão, Measuring the impact of oral health problems on children's quality of life: conceptual and methodological issues. Cadernos de saude publica, 2007. 23(11): p. 2555-2564. <https://doi.org/10.1590/S0102-311X2007001100003>
8. Yusuf, H., et al., Validation of an English version of the Child-OIDP index, an oral health-related quality of life measure for children. Health and quality of life outcomes, 2006. 4(1): p. 1-7. <https://doi.org/10.1186/1477-7525-4-38>
9. Jokovic, A., et al., Validity and reliability of a

- questionnaire for measuring child oral-health-related quality of life. *Journal of dental research*, 2002. 81(7): p. 459-463. <https://doi.org/10.1177/154405910208100705>
10. Slade, G.D., Derivation and validation of a short-form oral health impact profile. *Community dentistry and oral epidemiology*, 1997. 25(4): p. 284-290. <https://doi.org/10.1111/j.1600-0528.1997.tb00941.x>
 11. Traebert, E.S. and M.A. Peres, Do malocclusions affect the individual's oral health-related quality of life? *Oral Health & Preventive Dentistry*, 2007. 5(1).
 12. Onyeaso, C. and G. Aderinokun, The relationship between dental aesthetic index (DAI) and perceptions of aesthetics, function and speech amongst secondary school children in Ibadan, Nigeria. *International Journal of Paediatric Dentistry*, 2003. 13(5): p. 336-341. <https://doi.org/10.1046/j.1365-263X.2003.00478.x>
 13. De Oliveira, C., et al., Oral health-related quality of life and the IOTN index as predictors of children's perceived needs and acceptance for orthodontic treatment. *British Dental Journal*, 2008. 204(7): p. E12-E12. <https://doi.org/10.1038/bdj.2008.239>
 14. Cunningham, S.J., A.M. Garratt, and N.P. Hunt, Development of a condition-specific quality of life measure for patients with dentofacial deformity: I. Reliability of the instrument. *Community dentistry and oral epidemiology*, 2000. 28(3): p. 195-201. <https://doi.org/10.1034/j.1600-0528.2000.280305.x>
 15. Cunningham, S.J., A.M. Garratt, and N.P. Hunt, Development of a condition-specific quality of life measure for patients with dentofacial deformity: II. Validity and responsiveness testing. *Community dentistry and oral epidemiology*, 2002. 30(2): p. 81-90. <https://doi.org/10.1034/j.1600-0528.2002.300201.x>
 16. Momeni Danaei S, Fijan S, Mohammadi N, Soleimanzadeh R, Assessment of the Reliability and Validity of the Farsi Translation of the "Orthognathic Quality of Life Questionnaire" in 10-14 Year-Olds in Shiraz. *Journal of Islamic Dental Association of Iran*, 2014. 26(1): p. 33-8.
 17. Obilade, O.A., O.O. Sanu, and O.O. da Costa, Impact of three malocclusion traits on the quality of life of orthodontic patients. *International Orthodontics*, 2016. 14(3): p. 366-385. <https://doi.org/10.1016/j.ortho.2016.07.003>
 18. Agou, S., Oral health related quality of life outcomes of orthodontics in children. 2009: University of Toronto.
 19. Oluranti, O.D. and L.U. Ifeoma, Referral mode and pattern of malocclusion among patients attending the Lagos university teaching hospital, Lagos, Nigeria. *Odontostomatol Trop*, 2009. 32(128): p. 17-23.
 20. Anosike, A., O. Sanu, and O. Da Costa, Malocclusion and its impact on quality of life of school children in Nigeria. *West African journal of medicine*, 2010. 29(6). <https://doi.org/10.4314/wajm.v29i6.68298>
 21. Kolawole, K., O. Otuyemi, and A. Oluwadaisi, Assessment of oral health-related quality of life in Nigerian children using the Child Perceptions Questionnaire (CPQ 11-14). *European journal of paediatric dentistry*, 2011. 12(1): p. 55.
 22. Hassan, A.H. and H.E.-S. Amin, Association of orthodontic treatment needs and oral health-related quality of life in young adults. *American Journal of Orthodontics and Dentofacial Orthopedics*, 2010. 137(1): p. 42-47. <https://doi.org/10.1016/j.ajodo.2008.02.024>
 23. Bos, A., J. Hoogstraten, and B. Prah Andersen, Expectations of treatment and satisfaction with dentofacial appearance in orthodontic patients. *American journal of orthodontics and dentofacial orthopedics*, 2003. 123(2): p. 127-132. <https://doi.org/10.1067/mod.2003.84>
 24. Feu, D., et al., Oral health-related quality of life and orthodontic treatment seeking. *American Journal of Orthodontics and Dentofacial Orthopedics*, 2010. 138(2): p. 152-159. <https://doi.org/10.1016/j.ajodo.2008.09.033>
 25. Rusanen, J., et al., Quality of life in patients with severe malocclusion before treatment. *The European Journal of Orthodontics*, 2010. 32(1): p. 43-48. <https://doi.org/10.1093/ejo/cjp065>