

Impact of malocclusion on the quality of life of Pakistani children

Alizeh Abbas Gardezi^a, Arfan Ul Haq^b, Muhammad Azeem^c, Farzana Ambreen^d, Hareem Sultan^e, Ali Raza^f

Abstract

Introduction: There are various orthodontic conditions that can affect quality of life of a person. The aim of this study was to determine the quality of life score in kids with orthodontic conditions presenting in a tertiary care hospital.

Material and Methods: Three hundred patients were selected from outpatient, Department of Orthodontics, de'Mont/Punjab Dental Hospital, Lahore. The study as well as research protocol was explained to patient and an informed consent was taken. Self-administered questionnaire (CPQ) was given to the participants. It was explained to them and they filled it without any help from parents. Randomly 10 cases were rechecked to rule out error.

Results: The mean total Quality of Life (QOL) score was 10.18 ± 6.89 . There was significant difference between the means of total QOL score with malocclusion severity levels and insignificant difference was found with gender.

Conclusions: Quality of life is significantly affected by the severity of orthodontic conditions.

Keywords: Malocclusion; psychological issues; pediatric patients

Introduction

Malocclusion features the third highest amongst oral problems. The prevalence of malocclusion has been reported in a range from 20% to 80% in the majority of studies. This wide range is due to differences in ethnicity, age groups, and registration procedures.^{1,2} Association between malocclusion and quality of life is reported Saudi Arabia, Canada, New Zealand, Korea, and many other countries.³⁻⁶

Orthodontic conditions can adversely affect an individual personal self-concept and self-esteem not only during adolescence but also in adulthood.⁷ Orthodontic conditions can

adversely affect quality of life more than gingivitis and dental caries.⁸ Health related quality of life (HRQOL) is a instrument to rule out not only presence or severity of oral pathologies but also to find out impact of these diseases on quality of life of individuals in terms of functional or psychological variables.⁹⁻¹¹

HRQOL can be applied in children using different questionnaires, such as Child Perception Questionnaire (CPQ). This questionnaire consists of above 35 questions to find out impact of different conditions on quality of life of children in terms of functional or psychological variables. This questionnaire is available for different age groups such as 6-7, 8-10 and 11-14 years.¹²⁻¹⁵

International data is publishing on the impact of different orthodontic conditions on quality of life of children in terms of functional or psychological variables,¹⁶⁻²⁰ but local data is little regarding impact of different orthodontic conditions on quality of life of children. Review of previous literature shows

^a Corresponding Author; BDS, FCPS. Senior Demonstrator Orthodontics, Rashid Latif Medical & Dental College, Lahore. E-mail: dr_alizehgardezi@hotmail.com

^b BDS, MDS, FCPS (Orthodontics); MCPS (Oper.D). Professor of Orthodontics, de'Montmorency College of Dentistry, Lahore, Pakistan.

^c BDS, FCPS. Assistant Professor, Orthodontics, Dental Section- FMU/PMC, Faisalabad, Pakistan.

^{d,e} BDS. Former Postgraduate trainee Orthodontics, de'Montmorency College of Dentistry, Lahore, Pakistan.

^f BDS, FCPS. Assistant Professor Orthodontics, Akhter Saeed medical & Dental College, Lahore, Pakistan.

limited studies performed on Pakistani population on the subject matter. Keeping in mind the geographical variations of Pakistani population as compared to other populations, present study was aimed at determining the quality of life score in kids with orthodontic conditions at orthodontic department of our institute.

Material and Methods

This study was conducted after informed consent and ethics approval, on three hundred patients at orthodontic department of de'Mont/PDH, Lahore, Pakistan, with age range of 11-14 years fulfilling the inclusion criteria. Patients with full permanent dentition excluding third molars, no history of previous orthodontics therapy and having malocclusion assessed on the basis of DAI score. Patients below age 11 and above age 14, with missing first molars due to pathological reasons, having congenital abnormality e.g. cleft lip/ palate or dental anomalies, and poor oral hygiene were excluded from the sample. Self-administered questionnaire (CPQ)¹¹⁻¹⁴ was given to the participants. It was explained to them and they filled it without any help from parents. Randomly 10 cases were rechecked to rule out error.

Descriptive statistics were calculated. Mean \pm S.D was calculated for numerical variables of quality of life, total quality of life score and DAI score. Frequency and percentages were calculated for qualitative variables as gender. Data was stratified on the basis of severity of malocclusion and baseline DAI score to address effect modifiers and biases. Independent sample "t" test was applied.

Results

The mean age was 12.45 ± 1.13 years. Male patients were 104 (52%) and females were 96 (48%). Mean oral symptoms domain (OSD) were 10.08 ± 6.89 , functional limitation domain (FLD) were 1.90 ± 1.73 , emotional well-

being (EWD) were 3.58 ± 3.01 and social well-being (SWD) were 2.94 ± 2.48 . Mean total QOL

Table I Descriptive Statistics Quality of life score (QOL), Oral symptoms, functional aspects, psychological aspects, social aspects and dental Aesthetic index (DAI) in children with malocclusion

Descriptive statistics of cases (200)	Mean \pm SD	Minimum	Maximum
Total QOL score	10.18 ± 6.89	00	26
Oral symptom domain	1.79 ± 1.08	00	04
Functional Limitation domain	1.90 ± 1.73	00	06
Emotional well being	3.58 ± 3.01	00	09
Social well being	2.94 ± 2.48	00	09
DAI score	27.13 ± 9.52	05	53

Table II Comparison of DAI score with malocclusion severity levels

Severity levels		Mean Difference (I-J)	Sig.
Definite/Minor	moderate	-10.00	0.000
	Severe	-14.50	0.000
	V sever/handicapping	-24.28	0.000
Moderate	Minor	10.00	0.000
	Severe	-4.50	0.000
	V sever/handicapping	-14.28	0.000
Severe	Minor	14.50	0.000
	Moderate	4.50	0.000
	V sever/handicapping	-9.78	0.000
Very severe (handicapping)	Minor	24.28	0.000
	Moderate	14.28	0.000
	Severe	9.78	0.000

score was 10.18 ± 6.89 and mean DAI score was 27.13 ± 9.52 with minimum 05 and maximum 53 (Table I).

The study results showed significant difference between the means of DAI scores

with malocclusion severity levels i.e. p-value=0.000 respectively (Table II). The study results showed significant difference between the means of total QOL score with malocclusion severity levels except the severe versus very severe and very severe versus severe condition (Table III).

Table III Comparison of total QOL score with malocclusion severity levels

	Malocclusion severity level	Mean Difference (I-J)
Minor	Moderate	-4.11
	Severe	-12.0
	V sever/handicapping	-10.30
Moderate	Minor	4.11
	Severe	-7.90
	V sever/handicapping	-6.19
Severe	Minor	12.01
	Moderate	7.90
	V sever/handicapping	1.71
Very severe (handicapping)	Minor	10.30
	Moderate	6.19
	Severe	-1.71

Discussion

Orthodontic conditions can badly affect quality of life of orthodontic patients especially children.¹⁹ To our knowledge this is the first study which is aimed at determining the quality of life score in kids with orthodontic conditions at orthodontic department of de'Mont/PDH, Lahore, Pakistan.

According to the present study the no/minor level of malocclusion was noted in 84(42%) patients, definite/moderate severity level was noted in 62(31%) patients, severe condition was noted in 21(10.50%) patients and very severe (handicapping) condition was noted in 33(16.50%) patients. The increasing level of malocclusion resulted in concomitant increase in the QOL score. By comparison (LSD test) significant difference was noted. According to the results, malocclusion significantly affected the quality of life at each level.

Significant differences were found between DAI severity groups for the four domains and

the total CPQ11-14 scores in one of the studies.²¹ Although sample included children with severe (handicapping) malocclusion and they fell under higher domain compared to children with no/minor malocclusion.

The results are in agreement with findings of another study which revealed that orthodontic conditions can affect quality of life of orthodontic patients especially children,²² the study also showed that orthodontic conditions can affect emotional well-being aspect of quality of life of female orthodontic children. The results are also in agreement with findings of another study which revealed that orthodontic conditions can affect quality of life of orthodontic children,²³ the study also showed that orthodontic conditions can cause psychological discomfort.

The findings of our study are in accordance with studies where it was shown that orthodontic conditions impact quality of life more than other dental diseases.²⁴ However, in comparison, our study showed no gender differences regarding impact of orthodontic conditions on oral health related quality of life of orthodontic children. The findings of Rusanen et al.,²⁴ showed that gender differences do impact QOL in orthodontic patients.

The findings of our study are in comparison with studies where it was shown that orthodontic conditions and dental caries does not impact quality of life.²⁵ The findings of Kolawole et al.,²⁴ showed that orthodontic conditions and dental caries does not impact quality of life of Nigerian children. This shows that quality of life and malocclusion is probably mediated by other factors as well.

There are few limitations of this study such as small size of the orthodontic patient's sample, and descriptive design of the study. However within the limitations present study showed that quality of life is affected by the oral health status of any given patient and malocclusion in particular effects the well-being of Orthodontic patients.

Conclusions

The quality of life is affected by the oral health status of any given patient. Malocclusion in particular affects the well-being of Orthodontic patients.

References

1. Akbari M, Lankarani KB, Honarvar B, Tabrizi R, Mirhadi H, Moosazadeh M. Prevalence of malocclusion among Iranian children: A systematic review and meta-analysis. *Dent Res J (Isfahan)* 2016 Sep;13(5):387-95
2. Araki M, Yasuda Y, Ogawa T, Tumurkhum T, Ganburged G, Bazar A and Fujiwara T. Associations between Malocclusion and Oral Health-Related Quality of Life among Mongolian Adolescents. *Int. J. Environ Res Public Health* 2017; 14:902-12
3. Dawoodbhoy I, Delgado-Angulo EK, Bernabé E. Impact of malocclusion on the quality of life of Saudi children. *The Angle Orthod* 2013;83(6):1043-8
4. Agou, S.; Locker, D.; Streiner, D.L.; Tompson, B. Impact of self-esteem on the oral-health-related quality of life of children with malocclusion. *Am J Orthod Dentofacial Orthop* 2008;134: 484-9
5. Foster Page, L.A.; Thomson, W.M.; Jokovic, A.; Locker, D. Validation of the child perceptions questionnaire (cpq11-14). *J Dent Res* 2005;84:649-52
6. Choi SH, Kim JS, Cha JY, Hwang CJ. Effect of malocclusion severity on oral health-related quality of life and food intake ability in a Korean population. *Am J Orthod Dentofacial Orthop* 2016;149:384-90
7. Vieira-Andrade RG, de Paiva SM and Marques LS. Impact of Malocclusions on Quality of Life from Childhood to Adulthood. *Issues in Contemporary Orthodontics*. 2015 Sep. <http://dx.doi.org/10.5772/59485> 55
8. Sung-Hwan Choi, Jung-Suk Kim, Jung-Yul Cha, Chung-Ju Hwang, Effect of malocclusion severity on oral health-related quality of life and food intake ability in a Korean population, *Am J Orthod Dentofacial Orthop* 2016;149(3):384-90
9. Meade, Tanya & Dowswell, Elizabeth. (2016). Adolescents' health-related quality of life (HRQoL) changes over time: A three year longitudinal study. *Health and Quality of Life Outcome* 14.10.1186/s12955-016-0415-9
10. World Health Organization. WHO | Oral Surveys, Basic methods. 5th edition, Geneva, 2013, Accessed 06 June 2017
11. Adib Kassis,¹ Nada El Osta,^{2,3,4} Stéphanie Tubert-Jeannin,^{3,5} Martine Hennequin,^{3,5} Lana El Osta,⁴ and Joseph Ghoubril¹ Cross-cultural adaptation and validation of the child perceptions questionnaire (CPQ₁₁₋₁₄) among children in Lebanon. *BMC Oral Health*. 2018; 18: 18.
12. Allen PF. Assessment of oral health related quality of life. *HealthQual Life Outcomes*. 2003 Sep 8;1:40.
13. Gherunpong S., Tsakos G., Sheiham A. The prevalence and severity of oral impacts on daily performances in Thai primary school children. *Health Qual. Life Outcomes*. 2004;2:57.
14. Adib Kassis,¹ Nada El Osta,^{2,3,4} Stéphanie Tubert-Jeannin,^{3,5} Martine Hennequin,^{3,5} Lana El Osta,⁴ and Joseph Ghoubril¹ Cross-cultural adaptation and validation of the child perceptions questionnaire (CPQ₁₁₋₁₄) among children in Lebanon. *BMC Oral Health*. 2018; 18: 18.
15. N. Anthony, Severine & Zimba, Kayembe & Subramanian, Balakrishnan. (2018). Impact of Malocclusions on the Oral Health-Related Quality of Life of Early Adolescents in Ndola, Zambia. *International Journal of Dentistry*. 2018. 1-8
16. SIMOES, Roberto Cuchiara et al . Impact of Malocclusion on Oral Health-Related Quality of Life of 8-12 Years Old Schoolchildren in Southern Brazil. *Braz. Dent. J., Ribeirão Preto* , v. 28, n. 1, p. 105-112, Feb. 2017
17. O'Brien C, Benson P, Marshman Z. Evaluation of a quality of life measure for children with malocclusion. *Journal of Orthodontics*. 2007;34(3):185-93
18. Hanna, Antoine et al. "Malocclusion in Elementary School Children in Beirut: Severity and Related Social/Behavioral Factors." *International journal of dentistry* (2015).
19. Peres, SH, Goya S, Cortellazzi KL, Ambrosano GM, Meneghim, Mde C, Pereira AC. Self-perception and malocclusion and their relation to oral appearance and function. *Cienc. Saude Coletiva* 2011, 16, 4059-4066.
20. Johal A, Cheung M, Marcenes W. The impact of two different malocclusion traits on quality of life. *British dental journal*. 2007;202(2):E6-E.
21. Dawoodbhoy I, Delgado-Angulo EK, Bernabé E. Impact of malocclusion on the quality of life of Saudi children. *The Angle orthodontist*. 2013;83(6):1043-8.
22. Farzanegan F, Heravi F, Sooratgar A, Dastmalchi P. Evaluation of relationship between oral health-related quality of life and occlusion traits among female adolescents. *Dental research journal*. 2014;11(6):684-8.
23. Mu Chen, Zhi-Cai Feng, Xue Liu, Zheng-Ming Li, Bin Cai, and Da-Wei Wang (2015) Impact of malocclusion on oral health-related quality of life in young adults. *The Angle Orthodontist*: November 2015, Vol. 85, No. 6, pp. 986-991.
24. Rusanen J, Lahti S, Tolvanen M, Pirttiniemi P. Quality of life in patients with severe malocclusion

- before treatment. *The European Journal of Orthodontics*. 2010;32(1):43-8.
25. Kolawole K, Otuyemi O, Oluwadaisi A. Assessment of oral health-related quality of life in Nigerian children using the Child Perceptions Questionnaire (CPQ 11-14). *European journal of paediatric dentistry: official journal of European Academy of Paediatric Dentistry*. 2011;12(1):55-9.