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ORIGINAL ARTICLE

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Impact of malocclusion on oral health-related quality of life in Brazilian children with cleft lip and palate

Impacto da má oclusão na qualidade de vida relacionada à saúde oral de crianças brasileiras com fissura de lábio e palato

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ABSTRACT

Objective: This cross-sectional study aimed to evaluate the impact of malocclusion on the oral health-related quality of life (OHRQoL) in Brazilian children with non-syndromic oral clefts at tertiary craniofacial center. **Material and Methods:** Sixty-nine children with non-syndromic oral clefts, aged between 8 and 10 years, were selected and divided into groups according to the cleft type: Group 1 – Children with complete unilateral cleft lip and alveolus; Group 2 – Children with unilateral cleft lip and palate; Group 3 – Children with cleft palate.Each child answered the Child Perceptions Questionnaire8-10 (CPQ 8-10) which is a multiple-choice questionnaire, with 29 questions on the impact of oral diseases on the OHRQoL. Then, a visual examination of dental occlusion was carried out. Kruskal-Wallis and Mann-Whitney tests were used to determine statistical significant differences among groups ($p<0.05$). **Results:** No statistically significant differences were verified for the impact of cleft type ($p=0.895$) and malocclusion ($p=0.528$) on OHRQoL of Brazilian children with oral clefts. **Conclusion:** The malocclusion did not impact on the OHRQoL of 8-10 year-old children with non-syndromic clefts.

KEYWORDS

Cleft lip; Cleft palate; Quality of life; Oral health.

RESUMO

Objetivo: Este estudo transversal avaliou o impacto da má oclusão sobre a qualidade de vida relacionada à saúde oral de crianças brasileiras com fissuras labiopalatina não sindrômicas de um centro de tratamento craniofacial. **Material e Métodos:**Sessenta e nove crianças com fissure labiopalatina não sindrômica, com idades entre oito e dez anos, foram selecionadas e divididas em grupos de acordo com o tipo de fissure: Grupo 1 – Crianças com fissura completa de lábio e alvéolo; Grupo 2 – Crianças com fissura completa de lábio e palato; Grupo 3 – Crianças com fissura de palato.Cada criança respondeu o Child Perceptions Questionnaire8-10 (CPQ 8-10) que é um questionário de múltipla escolha, com 29 perguntas sobre o impacto das doenças orais sobre a qualidade de vida. Em seguida, o exame visual da oclusão foi realizado. Os testes de Kruskal-Wallis and Mann-Whitney foram usados para determinar as diferenças estatisticamente significativas entre os grupos ($p<0,05$). **Resultados:** Diferenças estatisticamente significativas não foram verificadas para o impacto do tipo de fissura ($p=0,895$) e má oclusão ($p=0,528$) na qualidade de vida de crianças brasileiras com fissuras labiopalatinas. **Conclusão:** A má oclusão não teve impacto sobre a qualidade de vida de crianças com idade entre oito a dez anos com fissure de lábio e palato não sindrômica.

PALAVRAS-CHAVE

Fenda labial; Fissura palatina; Qualidade de vida; Saúde bucal.

INTRODUCTION

The oral health related quality of life (OHRQoL) is a multidimensional construct reflecting people's comfort when eating, sleeping, and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health[1,2]. Oral health surveys and clinical trials in dentistry are increasingly using the measures addressing OHRQoL because they register the functional and psychosocial outcomes of oral disorders and are intended to supplement clinical indicators to provide a comprehensive evaluation of the individuals' and populations' health[3].

Current studies have demonstrated that the reports on OHRQoL in children are reliable and valid[4,5].The assessment of OHRQoL in children gives the patient's perception towards their own oral health and may improve the communication among patients, parents and dental team[6].This enabled a better understanding of the oral health state consequences on the child's and family's life and may help in prioritizing the care and estimating the consequences of treatment approaches and initiatives [7].

Given that the oral disorders may negatively affect the OHRQoL, this concept has gained attention in children with cleft lip and palate[8-11]. Depending on the cleft type, those children are stigmatized because of appearance or/and speech, and thus may develop functional, social and emotional alterations during childhood[8,9,11-13].

Children with cleft lip and palate have occlusion problems[14]. In a population without clefts, malocclusions have negative effects on the OHRQoL, mainly in the dimensions of emotional and social well-being[15]. To the best of our knowledge the literature lacks reports on the impact of malocclusion in children with cleft lip and palate. The knowledge about the effect of malocclusion on OHRQoL in children with cleft lip and palate would help the clinicians to evaluate the treatment effects of the rehabilitative process of oral clefts.

Thus, the aim of this study was to evaluate the impact of malocclusion on the OHRQoL in Brazilian children with non-syndromic oral clefts.

MATERIAL AND METHODS

The Institutional Review Board of our institution approved the protocol of this study (CAAE: 01985012.1.0000.5441; protocol #232.237) regarding ethical aspects. The parents or guardians of the children received detailed information concerning the procedures involved in the study, and signed informed consent forms.

Inclusion criteria comprised children with cleft lip and/or palate, male and female, agedbetween 8 and 10 years, who attended routine dental treatment at the Hospital. Exclusion criteria consisted of the presence of syndrome and of the lack of hearing or speaking. All patients had primary closure of lip and soft palate done art appropriate time. The rehabilitation of clefts involved plastic lip surgery at 3 months of age and palate surgery around 1 year of age, as well as secondary alveolar bone graft performed between 9 and 12 years of age[14].

Sample size was calculated so that the number of selected children met the representative rating to conduct the study. Considering the standard deviation of OHRQoL functional limitation score (3.66)from a prior study of Wogelius et al. [16], with significance level of 5%, test power of 80%, and the minimum difference to be detected of 4.83 among the OHRQoL scores, the sample size was calculated in 10 individuals per group.

Selected children were divided into three groups according to their cleft types: Group 1 – Children with complete unilateral cleft lip and alveolus; Group 2 – Children with unilateral

cleft lip and palate; Group 3 – Children with cleft palate.

Each child answered the Child Perceptions Questionnaire8-10 (CPQ8-10) which is a multiple-choice questionnaire, with 29 questions on the impact of oral diseases on the OHRQoL. Questions 1 and 2 were about the gender and age of the child, respectively. Questions 3 and 4 were related to the global perception towards oral health and general well-being and displayed response options ranging from zero (0) to three (3). The questions 5 to 29 comprise four domains: questions 5 to 9 – oral symptoms, 10 to 14 – functional limitations, 15 to 19 – emotional well-being, and 20 to 29 – social well-being. These questions were measured through scores ranging from zero to four points: (0=never; 1=once or twice; 2=sometimes; 3=many times; 4=all days or almost all days). The total score was obtained by the sum of scores of all questions. The higher the score, the greater is the impact on the OHRQoL[7].

The selected children were submitted to a visual examination of dental occlusion. The children presenting anterior crossbite, posterior crossbite, or both were classified as "with alteration". Those without the aforementioned features were classified as "normal". Two independent examiners previously trained and calibrated performed the occlusion examinations.

Inter-examiner reproducibility was determined by Kappa test. Kruskal-Wallis was used to evaluate the variable group. Mann-Whitney test was used to evaluate the variables – occlusion and gender. P value < 0.05 was considered significant.

RESULTS

The sample was composed of seventy children. One child had difficulty in understanding the questions due to low discernment level and thus was excluded from the sample. The Cronbach´s alpha for internal consistency was 0.88. The value of Kappa test for the interexaminer reproducibility was k=0.73.

The sample distribution according to cleft type and malocclusion classification is presented in Table 1. No statistically significant differences were seen among the OHRQoL scores between genders (p=0.869) (Table 2). In the analysis of the four domains separately between genders, no statistically significant differences were observed for oral symptoms (p=0.936), functional limitations (p=0.332), emotional well-being (p=0.135) and social well-being (p=0.911) (Table 3).

Table 1 - Sample distribution according to groups and malocclusion

Cleft types/ Occlusion	Group 1	Group 2	Group 2	Total
Normal	7 (10.143%)	6 (8.695%)	11 (15.934%)	24 (34.78%)
with Alteration	3 (4.347%)	39 (56.515%)	3 (4.325%)	45 (65.22%)
Total	**10 (14.49%)**	**45 (65.21%)**	**14 (20.28%)**	**69 (100%)**

Table 2 - OHRQoL comparison between genders (Mann-Whitney test; p = 0.869)

Gender	N	Median	Q - 25%	Q - 75%
F	28	16	8.25	22.75
M	41	14	9	31

No statistically significant differences were verified among the scores of OHRQoL when comparing the three cleft types (p=0.895) (Table 4). By analyzing the four domains separately in groups, there was no statistically significant differences for oral symptoms (p=0.894), functional limitations (p=0.361), emotional well-being (p=0.863) and social well-being (p=0.857) (Table 5).

There were no statistically significant differences among the scores of OHRQoL when comparing the two types of malocclusion – normal and with alteration (p=0.528) (Table 6). By analyzing the four domains separately in groups, there was no significant differences for oral symptoms (p = 0.894), functional limitations (p = 0.597), emotional well-being (p = 0.531) and social well-being (p = 0.873) (Table 7).

Table 3 - Comparison of OHRQoL domains between genders (Mann-Whitney test)

Domains \ Gender	Male				Female				P
	n	(Median)	Q - 25%	Q - 75%	n	(Median)	Q - 25%	Q - 75%	
Oral Symptoms	41	5.0	3.0	7.5	28	5.5	2.0	8.0	0.936
Functional limitations	41	2.0	0.0	6.0	28	3.0	2.0	5.0	0.332
Emotional well-being	41	3.0	1.0	6.0	28	1.0	0.0	4.75	0.135
Social well-being	41	2.0	1.0	7.0	28	2.0	0.25	6.750	0.911

Table 4 - Comparison of OHRQoL among the cleft types (Kruskal-Wallis test; p=0.895)

Groups	n	Median	Q - 25%	Q - 75%
Group 1	10	1	9	24.5
Group 2	45	16	8.5	29.5
Group 3	14	14.5	10.75	26

Table 5 - Comparison of OHRQoL domains among the cleft types (Kruskal-Wallis test)

Domains \ Group	Group 1				Group 2				Group 3				P
	n	(Median)	Q - 25%	Q - 75%	n	(Median)	Q - 25%	Q - 75%	n	(Median)	Q - 25%	Q - 75%	
Oral Symptoms	10	4.0	2.0	7.5	45	5.0	3.0	8.0	14	6.0	1.5	7.25	0.896
Functional limitations	10	2.5	0.0	4.5	45	2.0	1.0	6.5	14	4.0	3.0	5.0	0.361
Emotional well-being	10	2.5	0.75	6.5	45	2.0	0.0	6.0	14	3.5	0.0	7.25	0.863
Social well-being	10	2.5	1.75	5.25	45	2.0	0.5	6.0	14	2.0	0.75	7.25	0.857

Table 6 - Comparison of OHRQoL between the malocclusion classifications (Mann-Whitney test; p=0.528)

Occlusion	n	Median	Q - 25%	Q - 75%
Normal	24	18	9.25	25.25
with alteration	45	15	8.5	29.5

Table 7 - Comparison of OHRQoL domains between malocclusion classifications (Kruakal-Wallis test)

Malocclusion / Domains	Normal				with Alteration				P
	n	(Median)	Q - 25%	Q - 75%	n	(Median)	Q - 25%	Q - 75%	
Oral Symptoms	24	5.0	2.0	7.750	45	5.0	3.0	8.0	0.894
Functional limitations	24	3.0	0.5	4.75	45	3.0	1.0	6.5	0.597
Emotional well-being	24	3.5	0.0	8.0	45	2.0	0.0	5.5	0.531
Social well-being	24	2.0	1.0	6.25	45	2.0	1.0	6.5	0.873

DISCUSSION

This present study found that the malocclusion had no impact on the OHRQoL of children with oral clefts. There were no reports in the literature that correlates cleft lip and palate and malocclusion at 8 to 10 years of age, but outcomes similar to those of this present study were reported for 4 to 7 year-old children[17]. Other studies suggested that OHRQoL of patients with oral clefts does not change with age[10]. Strong evidence suggested that malocclusions in the aesthetic zone negatively affect OHRQoL, mainly in the dimensions of emotional and social well-being, in children and adolescents without clefts[15]. The rationale behind our results would be that the speech and the lip repair seems to be more important for the 8-10 year-old children with oral clefts as they are closer to adolescence and the peer acceptance becomes more critical[18]. Accordingly, Tannure et al. [19] stated that clefts repaired during earlier childhood associated with a health care program, including psychological support, is beneficial for children with cleft lip and palate, which is the type of multidisciplinary care provided by the craniofacial center where the study took place. Secondarily, neither the cleft types nor the gender impacted on the OHRQoL, corroborating other studies [8,10,11].

The interest of researchers and rehabilitation centers around the world in assessing the OHRQoL of children with clefts has increased lately [20] because this is an important auxiliary tool for the clinical indicators in assessing the patient's health [2]. The use of instruments relating oral health with quality of life has been currently studied in dentistry. In this present study, the OHRQoL was measured using the CPQ8-10 questionnaire, due its large use in the literature and its availability in Portuguese language[7], despite the fact that CPQ8-10 questionnaire was not specifically designed for children with oral clefts. Recently, a theoretical model for OHRQoL in individuals with cleft[21] was proposed but both its validation and translation to Portuguese language are not available yet. The children attending routine dental treatment at the craniofacial center comprised this study sample and came from all Brazilian regions[22]. It is known that OHRQoL is a multidimensional construct measuring well-being associated with teeth, mouth and face, but differences in the scores have been verified regarding specific demographic and race characteristics[23]. In this present study, we did not assess the differences regarding race and demographic features, because although representing a test power of 80%, the sample size would not be sufficient to evidence them. In order to represent the whole occlusal condition of the children, we did not use the Angle's classification because individuals with clefts exhibit the following peculiar features that differentiate them from occlusal irregularities of individuals without clefts: tooth malpositioning and dental

anomalies; bone defect at the anterior alveolar ridge; sagittal maxillary deficiency; and transverse deficiency of the maxillary dental arc [14]. These aforementioned methodologic characteristics should be taken into account when analyzing our results.

The patient-reported outcome measures (PROMs) would ascertain the patient's views of their symptoms, functional status and health related quality of life[24]. However, PROM use in individuals with cleft lip and palate is difficult because congenital anomalies require long-term following-up periods and serial assessment strategies to monitor treatment progress over time[25]. In this context, our results may help in the understanding of how 8-10 year-old non-syndromic children with clefts notice their health guiding the professionals to provide a more holistic treatment.

Moreover, this study results evidenced that the literature still lacks validated, reliable, and safe instruments for understanding the perception of the OHRQoL in children with cleft lip and palate[9,20].Further studies applying specific instruments already validated and translated to other languages that detected the impact of malocclusion and other cleft-related features on OHRQoL are necessary aiming to improve the success of oral cleft treatments. The identification of efficient and targeted forms of instrument would enhance comparative studies on children with cleft lip and palate [25].

CONCLUSION

Based on the methodology and results of this study, the malocclusion did not impact on the OHRQoL of 8-10 year-old children with non-syndromic clefts.

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REFERENCES

1. Bennadi D, Reddy CV. Oral health related quality of life. Int Soc Prev Community Dent. 2013Jan;3(1):1-6.doi: 10.4103/2231-0762.115700.
2. Sischo L, Broder HL. Oral health-related quality of life: what, why, how, and future implications. J Dent Res. 2011 Nov;90(11):1264-70. doi: 10.1177/0022034511399918.
3. Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt G. Validity and reliability of a questionnaire for measuring child oral-health-related quality of life. J Dent Res. 2002 Jul;81(7):459-63.
4. Kramer FJ, Baethge C, Sinikovic B, Schliephake H. An analysis of quality of life in 130 families having small children with cleft lip/palate using the impact on family scale. Int J Oral Maxillofac Surg. 2007 Dec;36(12):1146-52.
5. Kramer FJ, Gruber R, Fialka F, Sinikovic B, Hahn W, Schliephake H. Quality of life in school-age children with orofacial clefts and their families. J Craniofac Surg. 2009 Nov;20(6):2061-6. doi: 10.1097/SCS.0b013e3181be8892.
6. Weintraub JA. Uses of oral health related quality of life measures in Public Health. Community Dent Health. 1998 Mar;15(1):8-12.
7. Barbosa TS, Vicentin MD, Gavião MB. Qualidade de vida e saúde bucal em crianças: part I: versão brasileira do Child Perception Questionnaire 8-10. Cienc Saude Colet. 20110ut;16(10):4077-85. http://dx.doi.org/10.1590/S1413-81232011001100013
8. Bos A, Prahl C. Oral health-related quality of life in Dutch children with cleft lip and/or palate.Angle Orthod. 2011 Sep;81(5):865-71. doi: 10.2319/070110-365.1.
9. Antonarakis GS, Patel RN, Tompson B. Oral health-related quality of life in non-syndromic cleft lip and/or palate patients: a systematic review. Community Dent Health. 2013 Sep;30(3):189-95.
10. Eslami N, Majidi MR, Aliakbarian M, Hasanzadeh N. Oral health-related quality of life in children with cleft lip and palate. J Craniofac Surg. 2013 Jul;24(4):e340-3. doi: 10.1097/SCS.0b013e31828b743b.
11. Antunes LS, Maues CP, Nadaes MR, Costa MC, Kuchler EC, Antunes LA. The impact of nonsyndromic oral clefts on family quality of life. Spec Care Dentist. 2014 May-Jun;34(3):138-43. doi: 10.1111/scd.12046.
12. Broder HL, Smith FB, Strauss RP. Habilitation of patients with clefts: parent and child ratings of satisfaction with appearance and speech. Cleft Palate Craniofac J. 1992 May;29(3):262-7.
13. Kramer FJ, Gruber R, Fialka F, Sinikovic B, Schliephake H. Quality of life and family functioning in children with nonsyndromic orofacial clefts at preschool ages. J Craniofac Surg. 2008 May;19(3):580-7. doi: 10.1097/SCS.0b013e31816aaa43.
14. Freitas JA, Garib DG, Oliveira M, Lauris Rde C, Almeida AL, Neves LT, et al. Rehabilitative treatment of cleft lip and palate: experience of the Hospital for Rehabilitation of Craniofacial Anomalies-USP (HRAC-USP) - Part 2: pediatric dentistry and orthodontics.J Appl Oral Sci. 2012 Mar-Apr;20(2):268-81.
15. Dimberg L, Arnrup K, Bondemark L. The impact of malocclusion on the quality of life among children and adolescents: a systematic review of quantitative studies. Eur J Orthod. 2015 Jun;37(3):238-47. doi: 10.1093/ejo/cju046.
16. Wogelius P, Gjorup H, Haubek D, Lopez R, Poulsen S. Development of Danish version of child oral-health-related quality of life

questionnaires (CPQ8-10 and CPQ11-14). BMC Oral Health. 2009 Apr 22;9:11. doi: 10.1186/1472-6831-9-11.

17. Sagheri D, Ravens-Sieberer U, Braumann B, von Mackensen S. An Evaluation of Health-Related Quality of Life (HRQoL) in a group of 4-7 year-old children with cleft lip and palate. J Orofac Orthop. 2009 Jul;70(4):274-84. doi: 10.1007/s00056-009-9906-1.

18. Damiano PC, Tyler MC, Romitti PA, Momany ET, Jones MP, Canady JW, et al.Health-related quality of life among preadolescent children with oral clefts: the mother's perspective. Pediatrics. 2007 Aug;120(2):e283-90.

19. Tannure PN, Soares FM, Küchler EC, Motta LG, Costa MC, Granjeiro JM. Measuring the impact of quality of life of children treated for orofacial clefts: a case-control study. J Clin Pediatr Dent. 2013 Summer;37(4):381-4.

20. Eckstein DA, Wu RL, Akinbiyi T, Silver L, Taub PJ. Measuring quality of life in cleft lip and palate patients: currently available patient-reported outcomes measures. Plast Reconstr Surg. 2011 Nov;128(5):518e-526e. doi: 10.1097/PRS.0b013e31822b6a67.

21. Broder HL, Wilson-Genderson M, Sischo L. Examination of a theoretical model for oral health-related quality of life among youths with cleft. Am J Public Health. 2014 May;104(5):865-71. doi: 10.2105/AJPH.2013.301686.

22. Freitas JA, das Neves LT, de Almeida AL, Garib DG, Trindade-Suedam IK, Yaedu RY, et al. Rehabilitative treatment of cleft lip and palate: experience of the Hospital for Rehabilitation of Craniofacial Anomalies/USP (HRAC/USP) - Part 1: overall aspects. J Appl Oral Sci. 2012 Feb;20(1):9-15. Doi: 10.1590/S1678-775720200100003.

23. Broder HL, Wilson-Genderson M, Sischo L. Health disparities among children with cleft. Am J Public Health. 2012 May;102(5):828-30. doi: 10.2105/AJPH.2012.300654.

24. Black N. Patient reported outcome measures could help transform healthcare. BMJ. 2013 Jan 28;346:f167. doi: 10.1136/bmj.f167.

25. 25. Ranganathan K, Vercler CJ, Warschausky SA, MacEachernMP, Buchman SR, Waljee JF. Comparative effectiveness studies examining patient-reported outcomes among children with cleft lip and/or palate: a systematic review. Plast Reconstr Surg. 2015 Jan;135(1):198-211. doi: 10.1097/PRS.0000000000000825.

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