

Impact of Orofacial Clefts on Oral Health Quality of Life: A Cross-sectional Survey Study in Saudi Arabia

Abdulrahman K. Alshammari¹, Safanah AlDakhayel², Ghaida Alsulaiman³, Fatemah Alzoori⁴, Albandari Alghurayes⁵, Taif Alshammari⁶, Muteb Algharbi⁷, Ammar A. Siddiqui⁸

ABSTRACT

Aim: To evaluate the effect of facial clefts on the dental health quality of life of affected individuals, and to determine whether age and gender affect the oral health quality of life differently.

Materials and methods: The cross-sectional survey included 50 participants (32 females and 18 males) from the northern region of Saudi Arabia, using a reliable and validated questionnaire, the Child Oral Health Impact Profile (COHIP), which measured self-reported oral health-related quality of life (OHRQoL) in children and adults using a five-point Likert scale. Statistical analysis was performed, and results were considered significant if the *p*-value was less than 0.05.

Results: The highest scores in the oral health domain were related to bad breath and reluctance in speaking or reading aloud in class within the school environment domain, with mean scores of 3.44 ± 1.3 and 3.52 ± 1.2 , respectively. Most patients showed apprehension regarding necessary dental treatments (mean = 1.44 ± 0.07). The study found a non-statistically significant difference in tooth discomfort between age groups (*p* = 0.092), with individuals aged from 20 to 29 experiencing higher levels of discomfort than other age groups surveyed.

Conclusion: The two topics with the highest mean scores in the oral health domain and the school environment domain were bad breath and not wanting to speak or read aloud in class. Females reported more discomfort, and there was a substantial association between gender and tooth pain/sensitivity.

Clinical significance: Understanding the difficulties cleft patients face is crucial, as doing so will enable dentists to encourage and handle these issues more effectively.

Keywords: Children, Cleft lip/palate, Clefts, Child Oral Health Impact Profile, Oral health, Quality of life, Saudi Arabia

The Journal of Contemporary Dental Practice (2023): 10.5005/jp-journals-10024-3531

INTRODUCTION

A common craniofacial malformation that can significantly impact oral and maxillofacial health, leading to impairments in both function and esthetics is the clefting of the lip and palate.¹⁻⁴ Cleft lip and palate are identified by splitting as a result of the facial processes failing to integrate during prenatal development in the lip and/or palate.⁵ A low quality of life-related to dental health is a common concern among individuals affected by this condition, with difficulties in eating, speaking, and social interactions.¹ Adults with treated cleft lip and palate expressed considerably higher levels of discontent with the entire facial looks, in research compared to a group without clefts.⁶ In both groups, The most important indicator of depression was dissatisfaction with one's facial appearance. Cleft lip and palate sufferers also showed lower levels of self-esteem than others who were unaffected.⁷ Additionally, psychological problems like low self-esteem and difficulty interacting with others have been noted in cleft patients.⁸ These negative self-image and psychological problems can lead to social and vocational issues, influencing patients with clefts therapy and development.⁸ Therefore, it is essential to comprehend how people with cleft lip and palate quality of life in relation to their oral health (OHRQoL).

Children's Quality of Life in terms of oral health is routinely evaluated using the (COHIP) survey. According to prior research, the COHIP questionnaire offers strong consistency and validity for evaluating the quality of life of youngsters with oral health issues.⁹ The COHIP questionnaire was discovered to have strong test-retest reliability and internal consistency, indicating that it is

^{1,7,8}Department of Preventive dentistry, College of Dentistry, University of Ha'il, Ha'il, Saudi Arabia

^{2,4-6}Dental Intern, College of Dentistry, University of Ha'il, Ha'il, Saudi Arabia

³General Dental Practitioner, Ha'il, Saudi Arabia

Corresponding Author: Abdulrahman K Alshammari, Department of Preventive dentistry, College of Dentistry, University of Ha'il, Ha'il, Kingdom of Saudi Arabia, Phone: +966 598092207, e-mail: Abra.alshammari@uoh.edu.sa

How to cite this article: Alshammari AK, AlDakhayel S, Alsulaiman G, et al. Impact of Orofacial Clefts on Oral Health Quality of Life: A Cross-sectional Survey Study in Saudi Arabia. *J Contemp Dent Pract* 2023;24(9):655-659.

Source of support: Nil

Conflict of interest: None

a valid tool for assessing dental health as a measure of life quality for the affected children.⁹ It has a reading score of 3.5, it is suitable for pupils in third grade or higher.¹⁰

Numerous research studies have examined the occurrence and distribution of facial clefts among Saudi Arabian infants.¹¹⁻¹⁴ The incidence of facial clefts was estimated to be 0.65-1.9/1,000 childbirths.¹³ In the Medina region, the prevalence was at its highest.¹³ The most prevalent orofacial defect in Northern Saudi Arabia was discovered to be cleft palate.¹⁴ It was shown that the most prevalent risk factor in cases of facial clefts was parental

consanguinity.¹³ Despite the facial cleft's prevalence in Saudi Arabia, its specific effects on oral health-related matters are often overlooked during scientific exploration.

The objective of the current research was to examine the effects of orofacial clefts on the quality of life in terms of oral health for individuals in the northern province of Saudi Arabia. Additionally, the study also aimed to investigate the potential correlation between age, gender, education level, and craniofacial diagnosis with the different factors that may affect the quality of life.

MATERIALS AND METHODS

The present study was an observational study having a cross-sectional design. The present study was conducted in the maxillofacial clinics in the secondary and tertiary Ministry of Health Hospitals in the northern region of Saudi Arabia. Data collection was done from April 22, 2022, to January 17, 2023. Ethical approval for the study was applied and approved through the Research Ethics Committee at the University of Ha'il, under the reference (H-2022-367). The non-probability convenient sampling technique was used to collect the data from the sampling groups. The minimum age requirement for participants was 10 years. The sample age was chosen so that all participants could read and had either mixed or permanent teeth and be able to understand the Arabic language with a sufficient level of knowledge to complete the questionnaire. To be eligible for participation, individuals had to have a diagnosis of nonsyndromic cleft lip and/or cleft palate. Those with syndromic cleft lip and palate, significant medical conditions, or mental disabilities were excluded from the study. Participants or their parents (for children under the age of 18) consented to agree to take part in the study before answering the questionnaires. Data were collected electronically using the Google form through various social media platforms such as WhatsApp, and Twitter or by scanning barcode.

The survey comprised 34 elements for the purpose of evaluating the Dental Health Effects Profile. The present study used the 5 points Likert scale questionnaire "Child Oral Health Impact Profile (COHIP)" as the study tool. The survey is meant to evaluate self-reported OHRQoL and has 34 questions divided into five categories to evaluate OHRQoL as below:

1. Dental Health (measure specific oral symptoms).
2. Functional well-being pertains to an individual ability to carry out specific daily activities.
3. Social-emotional well-being pertains to a child's mood states and interactions with others.
4. School environment refers to tasks and activities associated with the school setting.
5. Self-image pertains to a child's positive feelings and perceptions about themselves.

The questionnaire also contains four items that evaluate treatment outcomes, measuring expectations about the treatment procedure and its results. Additionally, it includes an assessment of global health, which evaluates the individual's attitude toward both oral and systemic health. The survey includes items that assess both the negative and positive aspects of OHRQoL. Lower scores indicate a more favorable attitude toward OHRQoL.

The survey questionnaire was translated into Arabic using both forward and reverse translations. The questions in the survey were initially translated from English to Arabic by a specialist who is fluent in both languages. However, to ensure accuracy, a second bilingual Arabic specialist was consulted to identify and correct any errors

that may have occurred during the initial translation. The survey was then translated back into English by a second translator, and any discrepancies were addressed and reviewed to produce a final version of the questionnaire.

The findings were collected through a questionnaire that was created to accurately assess the impact of cleft lip and palate on an individual's oral health-related quality of life and has been tested and confirmed to be reliable.¹⁵

The first page of the survey detailed the research purpose, survey duration, data management, and contact information for the researcher. Additionally, the initial component of the survey asked about sociodemographic factors such as nationality, age, gender, educational attainment, and cleft type.

Lower COHIP levels indicate more favorable OHRQoL, while larger numbers indicate worse OHRQoL. The responses to the subscale-specific items are added to calculate the subscale scores. The subscale scores are added to determine the overall OHRQoL score.

The collected data was entered and coded into a Microsoft Excel spreadsheet before being uploaded into the Social Sciences Statistical program version 22 for analysis. Categorical data was presented as a number and a percentage. Inferential statistics were conducted using the Pearson Chi-square test. Descriptive statistics, including the mean and standard deviation, were calculated for the five domain variables. A *p*-value of 0.05 was considered significant for the present study.

RESULTS

A total of 82 participants, including children, their parents, and adults, were approached digitally. Out of which 50 responded, with a response rate of 60%, and were recruited in the present study. The participants' average age was 25 years, with a gender distribution of 18 males and 32 females. The study included a participant group consisting of 64% females and 36% males. The age range of participants was as follows: 16% were between 10 and 19 years old, 46% were between 20 and 29 years old, 26% were between 30 and 39 years old, 8% were between 40 and 49 years old, and 4% were above 50 years old. In terms of cleft type, 14% of participants had cleft lip only, 54% had cleft lip and palate, and 32% had cleft lip and alveolus. The educational background of participants was diverse, with 62% having a college degree, 22% having a high school certificate, and 16% having completed primary or intermediate school (Table 1).

Relationship between Demographic Variables and COHIP Item

There was a difference, but it wasn't statistically significant ($p = 0.092$) observed between age and tooth pain/sensitivity, with individuals aged from 20 to 29 reporting a higher incidence of tooth pain. Additionally, a significant correlation was found between gender and tooth pain/sensitivity ($p = 0.043$), with females reporting more pain.

Regarding education level, a significant correlation was found between education level and being teased/bullied in class ($p = 0.021$), appearance concerns ($p = 0.009$), worries about others' opinions ($p = 0.004$), and feeling better about self-image after treatment completion ($p = 0.016$).

Furthermore, a statistically significant difference ($p = 0.03$) was observed between craniofacial diagnosis and positive self-image, with patients with cleft lip only reporting more negative self-image (Table 2).

Table 1: Relationship between demographic variables and COHIP item

No.	Reasons for seeking orthodontic treatment	p-value	Interpretation
1	Age and tooth discomfort	p = 0.092	Age group 20–29 experienced higher tooth discomfort
2	Gender and tooth pain/sensitivity	p = 0.043*	Female participants reported more tooth pain
3	Education level and teasing/bullying in class	p = 0.021*	Higher levels of education linked to being teased/bullied in class
4	Education level and having a good look	p = 0.009*	Higher levels of education linked to having a good look
5	Education level and worrying about others' opinions	p = 0.004*	Higher levels of education linked to worrying about others' opinions
6	Education level and self-image after treatment	p = 0.016	Higher levels of education linked to feeling better about self-image after treatment
7	Craniofacial diagnosis and self-image	p = 0.03*	Those with a cleft lip diagnosis felt worse about themselves

Table 2: Demographic characteristics of the participants (n = 50)

Variables	Frequency (n)	Percentage %
Gender		
Male	18	36
Female	32	64
Age		
10–19 years	8	16
20–29 years	23	46
30–39 years	13	26
40–49 years	4	8
50 years and above	2	4
Education level		
Primary	5	10
Intermediate	3	6
High School	11	22
University graduate	31	62
Craniofacial diagnosis		
Cleft lip	16	32
Cleft palate	7	14
Cleft lip and palate	27	54

*Significant, p-value

Table 3: Overall and subscale score for the participants in all domain

COHIP Item	QS	Mean	STD	
Oral health	Had pain in your teeth/toothache	2.98	1.097	
Well-being	Mouth breathing/snoring	2.50	1.199	
	Crooked teeth/spaces	3.08	1.536	
	Sores in mouth	2.10	1.374	
	Bad breath	3.44	1.280	
	Bleeding gums	3.26	1.306	
	Food stuck in teeth	3.34	1.272	
	Pain/sensitivity	2.52	1.249	
	Dry mouth/lips	2.74	1.192	
	Functional well-being	Trouble biting/chewing	2.64	1.274
		Difficulty eating	2.86	1.498
Trouble sleeping		2.74	1.411	
Had difficulty saying words		2.78	1.489	
Felt difficult to understand		2.64	1.495	
Difficulty keeping teeth clean		3.26	1.175	
Social emotional well-being		Been unhappy	2.70	1.502
		Worried/anxious	3.12	1.350
		Shy/withdrawn	2.76	1.422
		Avoided smiling/laughing	3.24	1.465
	Been teased/bullied	2.68	1.558	
	Looked different	2.62	1.483	
	worried what people think	3.40	1.340	
	Been upset/uncomfortable	2.80	1.498	
	School environment	Missed school	2.56	1.417
		Difficulty paying attention	2.88	1.534
Not wanted to speak		3.52	1.216	
Self-image	Not wanted to go to school	2.52	1.418	
	Been confident	3.40	1.414	
	Felt Attractive/good looking	3.36	1.453	
	Have good teeth	3.08	1.469	
	Will have good teeth	2.68	1.151	
Treatment expectancy	Feel good about myself	2.22	1.217	
	Will feel better about self when treatment is complete	2.04	0.968	
	Am nervous about treatment	1.44	0.705	
Overall health		2.14	1.294	
Overall oral health		1.70	0.678	

Overall and Subscale Score for the Participants in All Domain

Results showed that bad breath in the oral health domain and not wanting to speak/read aloud in class in the school environment domain had the highest mean scores (Mean 3.44 ± 1.3 and 3.52 ± 1.2, respectively), indicating their frequent occurrence. Conversely, sores in the mouth and pain/sensitivity had lower mean scores (2.10 ± 1.3 and 2.52 ± 1.2, respectively), suggesting less frequent prevalence. The social and emotional well-being domain showed higher mean values for items such as “worried what people think” and “avoided smiling/laughing” (3.40 ± 1.3 and 3.24 ± 1.3, respectively), indicating their common occurrence. In the school environment category, items such as “not wanting to speak” and “difficulty paying attention” had high mean values (3.52 ± 1.2 and 2.88 ± 1.5, respectively), pointing towards their frequent occurrence as school-related issues. Moreover, a majority of the patients expressed concern about the required dental therapy (Mean = 1.44 ± .07), (Table 3).

DISCUSSION

The objective of this study was to examine the occurrence of different oral health problems and related social and emotional well-being issues among individuals diagnosed with cleft lip and/or palate. The results showed that bad breath in the oral health domain and not wanting to speak/read aloud in class in the school environment domain were the most prevalent issues, while sores in the mouth and pain/sensitivity were less common. The social and emotional well-being domain indicated common occurrences of worrying about what others think and avoiding smiling/laughing. In the school environment category, not wanting to speak and difficulty paying attention were frequent issues. Additionally, a majority of the patients expressed concern about the required dental therapy.

These results concur with those of other studies. Comparatively to the control group, Ward et al. discovered that having a craniofacial cleft significantly affects OHRQoL in their study population from Ohio State in the USA.¹⁰ In research from North Italy and from Sudan, Cleft-faced kids had much lower total COHIP and dimension scores than controls, with the categories that were found to be most impacted being oral health, functional well-being, and social-emotional well-being.^{16,17} According to a study conducted by Broder and Wilson-Genderson in the USA and Canada, individuals with craniofacial conditions had notably lower COHIP scores and functional well-being scores compared to the control group.¹⁸ According to the aforementioned researchers, significant differences were observed in the Social-Emotional Well-being scores of craniofacial patients, and they also had notably lower School Environment scores. Additionally, Topolski et al. conducted a study in the USA and found that children with prominent facial variants had significantly lower quality of life scores compared to control children.¹⁹ Although using the identical 5-point Likert scale as the last studies, the current research score order was different. Almost all the time gave it one point, whereas the prior study gave it five points. As a result, the data were interpreted differently to earlier investigations.

Regarding age and gender, the current study's findings revealed that individuals aged from 20 to 29 and females reported a higher incidence of tooth pain/sensitivity. Furthermore, education level was found to be significantly correlated with being teased/bullied in class, appearance concerns, worries about others' opinions, and feeling better about self-image after treatment completion. This finding is in line with a previous study conducted in the USA, which discovered that individuals with orofacial clefts experienced a more significant impact on their social-emotional well-being during the ages of 15–18, as opposed to when they were between 8 and 10 or 11 and 14 years old.¹⁰ However, in their study, patients as young as 18 years old were included, which differs from the current study sample group. This age effect is possibly illustrated by that when children with orofacial clefts get older and engage with their classmates and colleagues, their concerns about appearance and the views of others become more relevant.^{20–22} The present study found that patients with cleft lip reported more negative self-image compared to a other types of clefts. This is in agreement with a previous report from Brazil that found individuals with cleft lip may have a more negative self-image compared to those with cleft palate.⁷ This may be due to the fact that a cleft lip is more visible and may cause more negative self-image than cleft palate.

These findings provide important insights into the potential factors that can impact dental health, appearance concerns, and self-image, which can have significant implications for the functional health and living quality of individuals having CL/P.

Facial clefts can have clinical manifestations that may explain the impact on functional well-being.²¹ One study found that individuals with orofacial clefts often experience difficulties with eating, speaking, and maintaining oral hygiene, which can affect their functional well-being.¹⁰ Additionally, these individuals may have malocclusion due to missing, rotated, or displaced teeth, as well as skeletal discrepancies and a constricted maxilla, which can impact their ability to chew food efficiently. Cleft palate is often associated with oronasal fistulas and/or velopharyngeal incompetence, which can result in hypernasal speech.¹⁰ It is common for individuals with orofacial clefts to experience issues with oral hygiene due to the presence of rotated and malpositioned teeth.²⁰ In addition, a significant number of participants with facial clefts had orthodontic appliances, which can result in functional problems.²¹ The Social-Emotional subscale revealed that cleft participants were more prone to feel anxious or apprehensive, to be bullied or teased, to feel different, to be concerned about what others thought, and to be unhappy or uncomfortable.²²

It is essential to include the management of these issues as part of the treatment plan and to offer support to patients in coping with the social and emotional difficulties that come with their condition. The significant correlation between the overall COHIP and social subscales suggests that children with CL/P may encounter psychosocial challenges due to the extended duration of treatment, which can impact their psychological well-being and satisfaction with their physical appearance.^{23,24} Moreover, the findings of the current research highlight the value of education in boost the social and emotional well-being of individuals with CL/P. By providing patients with knowledge and strategies to manage the social and emotional challenges they may face, it is possible to enhance their overall quality of life. It is crucial to increase awareness within the community regarding the cleft condition and its impact on affected individuals.¹⁷ Additional research is necessary to gain a deeper understanding of the underlying causes and potential interventions for addressing these concerns. It is also important to identify the most effective methods for providing support to individuals with CL/P.

One significant flaw in the current investigation was the limited number of sample studies. The small sample sizes can lead to non-applicable results, which can limit the generalizability of the findings.^{23–25} As a result, the findings cannot be generalized to other communities in Saudi Arabia. Furthermore, the scale's Arabic version employed in the study was only validated for face validity and reliability across tests. Secondly, it appears that the inclusion of a large age group in a study can pose limitations on the ability to generalize the results, as different age groups may have different perceptions and responses to the study's domains. The included in the current study were above 10 years old and older. This could affect the results since the variation between age groups may affect the perception of the different do domains. However, the older patient was included to see if the perceptions differed from age group to age group.

The outcome of this study is expected to have significant implications for the healthcare system in Saudi Arabia, as the prevalence of cleft lip and palate in the country is similar to that of other regions worldwide.¹² Through a better knowledge of oral health issues experienced by those who have it in the northern region, better care and support can be offered accordingly.

CONCLUSION

The results of a cross-sectional survey conducted on individuals with cleft lip and/or palate revealed significant associations between

age, gender, education level, and craniofacial diagnosis with various oral health issues and related social and emotional well-being concerns. The study found that females and individuals with lower education levels were more likely to experience tooth pain/sensitivity, appearance concerns, worries about others' opinions, and improved self-image after treatment completion. Additionally, patients with cleft lip only reported more negative self-image. These findings provide valuable insights into the factors that can impact the overall well-being and quality of life of individuals with cleft lip and/or palate. Further research is necessary to explore the underlying mechanisms and potential interventions for addressing these issues.

INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted in compliance with the Declaration of Helsinki and was approved by the Research Ethics Committee (REC) at the University of Hail on March 14, 2022, under protocol code H-2022-367.

REFERENCES

- Beluci ML, Genaro KF. Quality of life of individuals with cleft lip and palate pre-and post-surgical correction of dentofacial deformity. *Revista da Escola de Enfermagem da USP* 2016;50(02):217–223. DOI: <https://doi.org/10.1590/S0080-623420160000200006>.
- Broder HL, Wilson-Genderson M, Sisco L. Oral health-related quality of life in youth receiving cleft-related surgery: self-report and proxy ratings. *Qual Life Res* 2017;26(4):859–867. DOI: 10.1007/s11136-016-1420-5.
- Pisula E, Lukowska E, Fudalej PS. Self-esteem, coping styles, and quality of life in polish adolescents and young adults with unilateral cleft lip and palate. *Cleft Palate Craniofac J* 2014;51(3):290–299. DOI: 10.1597/13-002.
- Aziza A, Kandasamy R, Shazia S. Pattern of craniofacial anomalies seen in a tertiary care hospital in Saudi Arabia. *Annals Saudi Medicine* 2011;31(5):488–493. DOI: 10.4103/0256-4947.84626.
- Malcolm C, Johnston P. Embryogenesis of cleft lip and palate. *Plastic surgery Cleft lip and palate and craniofacial anomalies* 1990;4:2532. Available from: <https://books.google.com.sa/books?id=IPxpAAAAMAAJ>.
- Marcusson A, Paulin G, Östrup L. Facial appearance in adults who had cleft lip and palate treated in childhood. *Scand J Plast Reconstr Surg Hand Surg* 2002;36(1):16–23. DOI: 10.1080/028443102753478327.
- Glaeser A, Costa S, Collares M. Cleft lip and palate: evaluation of the psychological impact using the Rosenberg self-esteem scale. *Revista Brasileira de Cirurgia Plástica* 2001;33(2):187–195. DOI: <http://www.dx.doi.org/10.5935/2177-1235.2018RBCP0094>.
- De Sousa A, Devare S, Ghanshani J. Psychological issues in cleft lip and cleft palate. *Journal of Indian Association of Pediatric Surgeons* 2009;14(2):55–58. DOI: 10.4103/0971-9261.55152.
- Broder HL, McGrath C, Cisneros GJ. Questionnaire development: Face validity and item impact testing of the Child Oral Health Impact Profile. *Community dentistry and oral epidemiology* 2007;35(Suppl 1):8–19. DOI: 10.1111/j.1600-0528.2007.00401.x.
- Ward JA, Vig KW, Firestone AR, et al. Oral health-related quality of life in children with orofacial clefts. *The Cleft Palate-Craniofacial Journal* 2013;50(2):174–181. DOI: 10.1597/11-055.
- Alamoudi N, Sabbagh H, Innes N, et al. Prevalence and characteristics of non-syndromic orofacial clefts and the influence of consanguinity. *Journal of Clinical Pediatric Dentistry* 2014;38(3):241–246. DOI: 10.17796/jcpd.38.3.bm4m2158v17p2535.
- Sabbagh HJ, Innes NP, Sallout BI, et al. Birth prevalence of non-syndromic orofacial clefts in Saudi Arabia and the effects of parental consanguinity. *Saudi Medical Journal* 2015;36(9):1076–1083. DOI: 10.15537/smj.2015.9.11823.
- Albalawi F, Alsaed S, Alalola B, et al. Prevalence and patterns of orofacial clefts among children from different regions of Saudi Arabia: A systematic review. *International Journal of Clinical Pediatric Dentistry* 2023;16(1):124–130. DOI: 10.5005/jp-journals-10005-2507.
- AlShammari AF, AlShammari DH, Alshubmi HR, et al. Prevalence and incidence of orofacial cleft anomalies in children with cleft lip and palate associated with etiological deformities in Hail region, Saudi Arabia. *International Journal* 20175(6):141–145. DOI: 10.12691/ijdsr-5-6-2.
- Ralstrom E, da Fonseca MA, Rhodes M, Amini H. The impact of sickle cell disease on oral health-related quality of life. *Pediatr Dent* 2014;36(1):24–28. PMID: 24717705.
- Defabianis P, Cogo C, Massa S, et al. Oral-health-related quality of life among non-syndromic school-age children with orofacial clefts: Results from a cross-sectional study in Northern Italy. *Children* 2022;9(7):1098. DOI: <https://doi.org/10.3390/children9071098>.
- Ali MA, Abass SK, Nasir EF. A comparative assessment of oral health-related quality of life of children born with orofacial clefts in Sudan and their caregivers'. *BMC Oral Health* 2021;21(1):1–7. DOI: 10.1186/s12903-021-01514-2.
- Broder HL, Wilson-Genderson M. Reliability and convergent and discriminant validity of the Child Oral Health Impact Profile (COHIP Child's version). *Community dentistry and oral epidemiology* 2007;35(Suppl 1):20–31. DOI: 10.1111/j.1600-0528.2007.0002.x.
- Topolski TD, Edwards TC, Patrick DL. Quality of life: How do adolescents with facial differences compare with other adolescents? *The Cleft palate-craniofacial journal* 2005;42(1):25–32. DOI: 10.1597/03-097.3.1.
- Gorlin RJ, Cohen Jr MM, Hennekam RC. *Syndromes of the head and neck*: Oxford university press; 2001. p. 1283.
- Liu Z, McGrath C, Hägg U. Changes in oral health-related quality of life during fixed orthodontic appliance therapy: An 18-month prospective longitudinal study. *American Journal of Orthodontics and Dentofacial Orthopedics* 2011;139(2):214–219. DOI: 10.1016/j.ajodo.2009.08.029.
- Hunt O, Burden D, Hepper P et al. Self-reports of psychosocial functioning among children and young adults with cleft lip and palate. *The Cleft Palate-Craniofacial Journal* 2006;43(5):598–605. DOI: 10.1597/05-080.
- Alansari R, Bedos C, Allison P. Living with cleft lip and palate: the treatment journey. *The Cleft palate-craniofacial journal* 2014;51(2):222–229. DOI: 10.1597/12-255.
- Patjanasoonorn N. A qualitative study of health-related quality of life and psychosocial adjustments of Thai adolescents with repaired cleft lips and palates. *J Med Assoc Thai* 2011;94(6):S45–S50. PMID: 22423415.
- Pearson M, Parkin S, Coomber R. Generalizing applied qualitative research on harm reduction: The example of a public injecting typology. *Contemporary Drug Problems* 2011;38(1):61–91. DOI: <https://doi.org/10.1177/00914509110380010>.