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## Evaluation of Growth Indicators and Quality of Life in Children with Cleft Lip/Palate After Surgery

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### Abstract

**Introduction:** Oral clefts are a group of relatively common congenital anomalies, among which cleft lip and cleft palate (CLP) represent one of the major forms.

**Methods:** This study was conducted among patients with CLP. A total of 70 patients who had undergone CLP-related surgery were enrolled in the study. The study instrument consisted of several sections assessing demographic characteristics and Oral Health Impact Profile-14 (OHIP-14) questionnaire. The collected data were then analyzed and compared using SPSS software, version 18.

**Result:** Based on the findings, 70 patients were enrolled in the study. Sixty percent of the participants were male, and the largest age group was 6–9 years (36.7%). Regarding parental education, 38.3% of fathers had a secondary education level, while 43.3% of mothers had completed primary education. The mean (SD) of the total OHIP-14 score before surgery was 45.60 (2.30). Post-



operatively, this score significantly decreased to 30.21 (8.33), indicating a substantial improvement in the patients' quality of life following the surgical procedure. Findings revealed a reduction in scores across all seven domains of the OHIP-14 questionnaire post-surgery, reflecting a significant enhancement in the patients' OHRQoL. This improvement was statistically significant in all dimensions ( $P < 0.001$ ).

**Conclusion:** Given the significant post-surgical improvement in OHRQoL, it is highly recommended that reconstructive surgeries and associated rehabilitative care be prioritized to optimize the quality of life for patients with CLPA.

**Keywords:** Cleft lip and palate (CLP); Oral health-related quality of life; Children; Adolescents; Surgery; Oral health

## Introduction

Oral clefts are a group of relatively common congenital anomalies, among which cleft lip and cleft palate (CLP) represent one of the major forms. CLP is a craniofacial malformation whose prevalence varies across geographical regions, sex, ethnic populations, and socioeconomic groups [1]. Management of CLP requires a multidisciplinary medical approach, and its correction is often time-consuming and associated with long-term follow-up [2].

In high-income countries, patients with CLP usually undergo corrective and reconstructive surgeries during the first months of life. However, in low-income countries, particularly in economically disadvantaged and rural areas, surgical treatment is often delayed. Consequently, a considerable number of patients with untreated CLP remain in these regions, and their treatment is postponed due to several factors, including financial constraints, cultural barriers, limited access to healthcare services, and inadequate health literacy among patients and their families [1,3–5].

The birth of a new infant is often accompanied by stress and चिंता among parents. When the infant is affected by CLP, these concerns become even greater and may evolve into a substantial psychological challenge for the family. In addition to the burden placed on parents, children with CLP may experience social isolation due to their facial appearance, which can negatively affect their quality of life. Moreover, this condition may impair growth indicators and nutritional status, thereby imposing further adverse effects on quality of life [6–9]. Because of their facial deformity, many of these patients tend to withdraw socially and have difficulty participating in community life. In fact, one of the

primary goals of surgery in these patients is to improve facial appearance and facilitate social integration [10].

Children with CLP also experience difficulties with feeding as a result of their facial anatomy. Specifically, feeding problems arise from shorter sucking episodes, inability to generate adequate intraoral negative pressure, and impaired sucking rate, all of which contribute to poor swallowing ability and inefficient sucking patterns. These disturbances may lead to malnutrition in affected children and therefore require appropriate interventions to minimize their impact [11–13]. Feeding difficulties can subsequently impair child growth and further compromise quality of life [14,15].

Quality of life is an important, multidimensional, and abstract concept that has increasingly been recognized as a valuable outcome in health and social care research. It has been defined as an individual's perception of their position in life within the context of the culture and value systems in which they live, and in relation to their goals, expectations, concerns, and standards [16,17]. Patients with CLP may experience considerable alterations in quality of life due to poor self-perception, low self-esteem, physical problems, and social isolation [18].

Given the clinical and psychosocial importance of CLP, the present study was conducted to determine the association of cleft lip/palate surgery with improvement in growth indicators and quality of life among children.

## Methods

This study was conducted among patients with CLP. A total of 70 patients who had undergone CLP-related surgery were enrolled in the study. The inclusion criteria were as follows: at least 3 months having passed since surgery, age between 6 and 18 years, confirmed diagnosis of CLP, history of surgical treatment for CLP, and provision of informed consent by parents or the patient's legal guardian. The exclusion criteria included the presence of known genetic syndromes, autoimmune disorders, chronic diseases affecting growth and nutrition, diagnosed psychological disorders, and failure to cooperate adequately in completing the questionnaires.

The study instrument consisted of several sections assessing demographic characteristics, oral health status, nutritional status, and children's quality of life.

The demographic section included questions regarding the child's age, sex, parental education, family economic status, number of family members, and place of residence. Oral health-related



quality of life was assessed using the Oral Health Impact Profile-14 (OHIP-14) questionnaire. This instrument consists of 14 items covering 7 domains: physical pain, psychological discomfort, physical disability, functional limitation, psychological disability, handicap, and social disability. Each item is scored on a scale from 0 to 4, resulting in a total score ranging from 0 to 56. The final score reflects oral health-related quality of life (OHRQoL), with lower scores indicating better quality of life. The total OHRQoL score was categorized into three levels: scores between 38 and 56 indicated poor quality of life, scores between 19 and 37 indicated moderate quality of life, and scores below 19 indicated high quality of life [19,20].

In the present study, the researchers assessed patients' OHRQoL using the study instruments and compared the post-surgical findings with the preoperative status. Accordingly, the questionnaires were completed before surgery and again 3 months after surgery. The collected data were then analyzed and compared using SPSS software, version 18.

## Result

Based on the findings, 70 patients were enrolled in the study. Sixty percent of the participants were male, and the largest age group was 6–9 years (36.7%). Regarding parental education, 38.3% of fathers had a secondary education level, while 43.3% of mothers had completed primary education (Table 1).

**Table 1. Demographic characteristics of the study participants (N=60)**

| Variable                  | Category            | Frequency (n) | Percentage (%) |
|---------------------------|---------------------|---------------|----------------|
| <b>Gender</b>             | Male                | 36            | 60.0           |
|                           | Female              | 24            | 40.0           |
| <b>Age Group</b>          | 6–9 years           | 22            | 36.7           |
|                           | 10–13 years         | 21            | 35.0           |
|                           | 14–18 years         | 17            | 28.3           |
| <b>Father's Education</b> | No formal education | 15            | 25.0           |
|                           | Primary education   | 19            | 31.7           |
|                           | Secondary education | 23            | 38.3           |
|                           | Higher education    | 3             | 5.0            |
| <b>Mother's Education</b> | No formal education | 16            | 26.7           |
|                           | Primary education   | 26            | 43.3           |
|                           | Secondary education | 13            | 21.7           |
|                           | Higher education    | 5             | 8.3            |
| <b>Residence</b>          | Urban               | 34            | 56.7           |
|                           | Rural               | 26            | 43.3           |
| <b>Family Size</b>        | ≤2 members          | 26            | 43.3           |
|                           | 3–4 members         | 27            | 45.0           |
|                           | > 4 members         | 7             | 11.7           |



The mean (SD) of the total OHIP-14 score before surgery was 45.60 (2.30). Post-operatively, this score significantly decreased to 30.21 (8.33), indicating a substantial improvement in the

patients' quality of life following the surgical procedure (Table 2).

**Table 2. Mean and standard deviation of total OHRQoL scores before and after surgery**

| Variable                   | Pre-operative (Mean $\pm$ SD) | 3 Months Post-operative (Mean $\pm$ SD) | Statistical Test | P-value |
|----------------------------|-------------------------------|---|------------------|---------|
| <b>Total OHIP-14 score</b> | 45.60 $\pm$ 2.30              | 30.21 $\pm$ 8.33                        | Paired t-test    | < 0.001 |

Findings revealed a reduction in scores across all seven domains of the OHIP-14 questionnaire post-surgery, reflecting a significant enhancement in the patients' OHRQoL. This improvement was statistically significant in all dimensions (P < 0.001) (Table 3).

**Table 3. Comparison of OHIP-14 domains before and after surgery**

| OHRQoL Domains           | Pre-operative (Mean $\pm$ SD) | 3 Months Post-operative (Mean $\pm$ SD) | P-value |
|--------------------------|-------------------------------|---|---------|
| Functional Limitation    | 6.81 $\pm$ 0.82               | 3.75 $\pm$ 2.28                         | < 0.001 |
| Physical Pain            | 6.82 $\pm$ 0.72               | 4.01 $\pm$ 2.48                         | < 0.001 |
| Psychological Discomfort | 5.63 $\pm$ 1.28               | 4.23 $\pm$ 2.65                         | < 0.001 |
| Physical Disability      | 5.60 $\pm$ 0.97               | 4.71 $\pm$ 2.68                         | 0.02    |
| Psychological Disability | 6.48 $\pm$ 1.18               | 3.98 $\pm$ 3.05                         | < 0.001 |
| Social Disability        | 7.00 $\pm$ 0.75               | 4.40 $\pm$ 2.78                         | < 0.001 |
| Handicap                 | 7.25 $\pm$ 0.89               | 5.11 $\pm$ 2.73                         | < 0.001 |

Table 4 presents the mean OHRQoL (OHIP-14) scores based on demographic variables before and three months after surgery. The results indicated statistically significant differences between groups regarding gender, residence, and parental education levels (P = 0.001).



Table 4. Comparison of OHRQoL scores based on demographic variables

| Variable           | Category            | Pre-operative OHIP-14 score Mean (SD) | Post-operative OHIP-14 score Mean (SD) | P-value |
|--------------------|---------------------|---------------------------------------|--|---------|
| Gender             | Male                | 30.47 (8.55)                          | 45.77 (2.47)                           | 0.001   |
|                    | Female              | 29.83 (8.15)                          | 45.33 (2.05)                           |         |
| Residence          | Urban               | 30.11 (8.85)                          | 45.67 (1.80)                           | 0.001   |
|                    | Rural               | 30.34 (7.75)                          | 45.50 (2.87)                           |         |
| Father's Education | No formal education | 32.40 (9.36)                          | 45.00 (1.20)                           | 0.001   |
|                    | Primary education   | 30.73 (6.18)                          | 45.68 (1.70)                           |         |
|                    | Secondary education | 29.17 (8.98)                          | 45.73 (2.86)                           |         |
|                    | Higher education    | 24.00 (9.53)                          | 47.00 (1.00)                           |         |
| Mother's Education | No formal education | 31.12 (10.03)                         | 45.75 (1.52)                           | 0.001   |
|                    | Primary education   | 27.92 (8.35)                          | 46.07 (1.93)                           |         |
|                    | Secondary education | 33.46 (6.00)                          | 44.15 (3.02)                           |         |
|                    | Higher education    | 30.80 (5.44)                          | 46.40 (3.13)                           |         |

## Discussion

Based on the current findings, the Oral Health-Related Quality of Life (OHRQoL) among patients was suboptimal. Pasini et al. demonstrated that OHRQoL in adolescents with Cleft Lip and/or Palate (CLPA) is significantly compromised due to the inherent nature of the condition. Specifically, approximately 80% of patients scored above zero on the OHIP-14 scale, indicating poor quality of life. Indeed, CLPA transcends clinical implications, adversely affecting various dimensions of life, including daily activities, speech, aesthetic appearance, social interactions, and self-esteem [21]. Furthermore, a meta-analysis by de Oliveira Junior et al. revealed that the emotional, functional, and social domains are the most severely impacted areas in CLPA patients, consistently yielding lower OHRQoL scores [22]. Overall, patients with CLPA experience diminished

OHRQoL, with the most pronounced negative effects observed in functional, emotional, and social dimensions.

Our results further indicated that prior to surgical intervention, the majority of patients reported low OHRQoL levels. The most significant impairments were observed in the domains of handicap, social disability, functional limitation, physical pain, and psychological disability. Similarly, a study by Barros et al. in Brazil reported that OHRQoL in patients with Class III malocclusion was worse compared to those with Unilateral Cleft Lip and Palate (UCL/P), particularly in psychological and physical domains [23]. In a cross-sectional study conducted in Finland (2020), Corcoran found that despite undergoing various treatments, the quality of life for CLP patients remained unfavorable, with psychological discomfort and physical pain being the most affected domains [24]. Collectively, these findings align with previous literature, confirming that OHRQoL is



substandard in pre-surgical patients, predominantly affecting physical, psychological, and social dimensions.

Post-operatively, a significant improvement was observed across all OHRQoL domains. This finding is consistent with a 2020 study by Hideki de Lima Toyoshima et al. in Brazil, which reported comprehensive enhancement in all quality-of-life domains following treatment [25]. Additionally, a review by Hashemi et al. noted that while adults with CLPA often face reduced OHRQoL—specifically in physical and psychological aspects—despite multidisciplinary approaches, interventions such as orthognathic surgery and prosthodontics significantly ameliorate their condition [26]. These observations corroborate the results of the present study, suggesting that surgical intervention leads to a statistically significant elevation in OHRQoL across all assessed parameters.

### Limitations and Suggestions

The primary limitations of this study include its single-center design, descriptive nature, and the lack of clinical or paraclinical interventions. Consequently, it is recommended that future research focus on interventional strategies specifically designed to enhance the quality of life in this patient population.

### Conclusion

Given the significant post-surgical improvement in OHRQoL, it is highly recommended that reconstructive surgeries and associated rehabilitative care be prioritized to optimize the quality of life for patients with CLPA.

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