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Research Article

Parental Perception of Prenatal Surgical Consultation for Orofacial Clefts: A 5-Year Study

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Abstract

Introduction: Orofacial clefts are among the most common congenital malformations. They are associated with feeding, speech, otological, and psychosocial challenges, requiring long-term multidisciplinary follow-up. Prenatal ultrasound diagnosis enables birth planning, early surgical definition, organized postnatal care, and reduced parental anxiety when combined with counseling.

Our objectives were to analyze parental perception of prenatal surgical counseling in orofacial clefts and its association with emotional impact and clinical and neonatal variables.

Methods: Exploratory retrospective observational study (2021-2025) in a tertiary center, including pregnancies with prenatal diagnosis of orofacial clefts (n = 25). Parental perception was assessed using a structured Likert-scale questionnaire. Descriptive statistics summarized maternal, prenatal, and perinatal characteristics. Continuous variables were expressed as median (Q1-Q3); categorical variables as frequencies and percentages. Comparisons between cleft subtypes (isolated lip, isolated palate, combined lip-palate) used contingency tables and Pearson chi-square test, with $\alpha = 0.05$. Small sample size and low expected counts were noted. Analyses were performed using IBM SPSS Statistics®.

Results: Prenatal ultrasound diagnosis showed greater postnatal concordance lip and lip-palate clefts. Parental perception correlated with less anxiety and better preparation for postnatal care. Surgical procedures were performed at the expected times; 70.8% of children received multidisciplinary follow-up in our hospital. There were no significant changes in weight gain in the first 24 months of life.

Conclusion: Early diagnosis, prenatal counseling, multidisciplinary approach and individualized surgical planning, are fundamental to improve patient prognosis. Parental perception emerges as a critical component for optimizing clinical and emotional outcomes in children with orofacial clefts.

Keywords: Orofacial Clefts; Pediatric Surgery; Prenatal Diagnosis; Prenatal Surgical Consultation

Introduction

Orofacial clefts, including cleft lip, cleft palate, and combined cleft lip–palate, are among the most common congenital malformations, with a global incidence estimated between 1:700 and 1:1000 live births, varying according to genetic, ethnic, and environmental factors [1,2]. These malformations can lead to significant functional consequences, such as feeding difficulties, speech disorders, recurrent otologic infections, and substantial psychosocial impact, requiring prolonged multidisciplinary follow-up throughout childhood and adolescence [3,4]. Prenatal diagnosis of orofacial clefts is feasible in most cases through second-trimester morphological ultrasound, with accuracy improved by complementary techniques such as three-dimensional ultrasound and, in selected cases, fetal magnetic resonance imaging [5]. Early identification enables planned delivery in specialized centers, organized postnatal follow-up, and timely definition of the surgical treatment strategy [6,7]. Beyond clinical management, the prenatal diagnosis of a congenital malformation represents a highly emotional event for parents, often associated with anxiety, fear, and uncertainty regarding prognosis and family impact [8]. The manner in which the diagnosis is communicated and the counseling provided significantly influences parental emotional adaptation and treatment expectations [8,9]. Structured prenatal counseling has been shown to reduce parental anxiety and promote informed and positive understanding of the condition, with factors such as clear communication, physician empathy, sufficient consultation time, and opportunities for questions associated with higher parental satisfaction and better preparation for birth [8,10]. Despite its recognized importance, few quantitative studies have systematically evaluated parental perception of prenatal surgical counseling in cases of orofacial clefts, particularly in Portugal [11]. The present study aims to quantitatively analyze parental perception of prenatal surgical counseling for orofacial clefts over the past five years, and to explore its association with parental emotional impact, as well as clinical and neonatal variables.

Methods

Study Design: Exploratory retrospective observational study conducted at a tertiary hospital center.

Population: Pregnant women with a prenatal ultrasonographic diagnosis of orofacial clefts, referred for prenatal surgical counseling between 2021 and 2025. A total of 25 cases were included. Cases without follow-up or with incomplete data were excluded.

Prenatal Counseling Consultation: Included explanation of fetal malformation, proposed surgical plan, postnatal care, multidisciplinary follow-up, and time for parental questions.

Variables and Data Sources: Parental perception was assessed via a structured, validated 5-point Likert questionnaire [11] covering communication, consultation duration, accessibility, guidance/referrals, emotional impact, and overall quality. Children's weight from birth to 24 months was collected from electronic medical records. Missing weight data at 3, 6, 9, 12, 18, or 24 months were coded as 999 for SPSS analysis.

Data Collection and Missing Data: Parents gave oral informed consent via telephone. Some recollections were limited due to the time since consultation. One newborn followed in private care lacked surgical and weight data. Two children's parents were not contacted: one due to outdated phone numbers and one because the child was not yet born.

Statistical Analysis: Descriptive statistics summarized maternal, prenatal, and perinatal characteristics. Continuous variables were expressed as median (Q1-Q3); categorical variables as frequencies and percentages. Comparisons between cleft subtypes (isolated lip, isolated palate, combined lip-palate) used contingency tables and Pearson chi-square test, with $\alpha = 0.05$. Small sample size and low expected counts were noted. Analyses were performed using IBM SPSS Statistics®.

Ethical Considerations: Ethical approval for this exploratory study was granted by the Head of the Department of Pediatric Surgery in our hospital. The study was conducted following the principles of the Declaration of Helsinki and the GDPR. Informed consent was obtained from all parents/legal guardians, and all data were collected anonymously to ensure participant confidentiality.

Results

Maternal and Gestational Characteristics

A total of 25 pregnant women with a prenatal ultrasonographic diagnosis of orofacial clefts were included in this study, comprising isolated lip cleft (n = 7; 28%), isolated palate cleft (n = 3; 12%), and combined lip-palate cleft (n = 15; 60%) (Table 1). The median maternal age at diagnosis for the overall cohort was 33 years (Interquartile Range [IQR], 28.5–37.0). Median maternal age was similar across cleft subtypes-35 years (IQR, 25.0–37.0) for lip cleft, 33.0 years (IQR, 19.0-not applicable) for palate cleft, and 33.0 years (IQR, 32.0–37.0) for lip-palate cleft. No significant association was observed between maternal age and prenatal type of orofacial malformation. Maternal age was widely distributed across cleft subtypes, and chi-square analysis did not demonstrate statistically significant differences ($p = 0.445$) (Table 1). A family history of orofacial clefts was reported in 6 cases (24% of the total sample). Among these, 2 cases (33.3%) were associated with lip cleft, 1 case (16.7%) with palate cleft, and 3 cases (50.0%) with

lip-palate cleft. When analyzed by cleft subtype, family history was present in 28.6% of lip clefts, 33.3% of palate clefts, and 20.0% of lip-palate clefts. No significant association was observed between family history of orofacial clefts and prenatal cleft type ($p = 0.837$) (Table 1). The median gestational age at prenatal diagnosis was 22.0 weeks (IQR, 21.0–23.0) in the overall cohort and was consistent across all cleft types. Thus, it was not significantly associated with the type of orofacial malformation ($p = 0.663$) (Table 1).

Variable	Total results (n = 25; 100%)	Lip cleft (n = 7; 28%)	Palate cleft (n = 3; 12%)	Lip–palate cleft (n = 15; 60%)	*p* value
Maternal age at diagnosis (median; Q1-Q3)	33 (28.5-37.0)	35 (25.0-37.0)	33 (19.0-N.A.)	33 (32.0-37.0)	N.S.
Family history of orofacial clefts (n)	6	2	1	3	N.S.
% total	24	33.3	16.7	50	
% per cleft type	N.A.	28.6	33.3	20	
Gestational age at diagnosis (weeks) (median; Q1-Q3)	22 (21.0-23.0)	22 (22.0-22.0)	22 (13.0-N.A.)	22 (21.0-26.0)	N.S.
Adequate gestational monitoring (n)	23	7	3	13	N.S.
% total	92	30.4	13	56.6	
% per cleft type	N.A.	100	100	86.7	
Invasive prenatal testing (n) (%)					N.S
Not performed	3	0	0	3	
% total	12	0	0	100	
% per cleft type	N.A.	0	0	20	
Normal result	21	7	3	11	
% total	84	33.3	14.3	52.4	
% per cleft type	N.A.	100	100	73.3	
Abnormal result	1	0	0	1	
% total	4	0	0	100	
% per cleft type	N.A.	0	0	6.70%	
Maternal nationality (n) (%)					N.S.
Portugal	19	7	3	9	

% total	76	36.8	15.8	47.4	
% per cleft type	N.A.	100	100	60	
Migrants	6	0	0	6	
% total	24	0	0	100	
% per cleft type	N.A.	0	0	40	
Type of malformation diagnosed postpartum (n) (%)					0.001
Lip-cleft	N.A.	5 (71.4%)	0 (0.0%)	2 (14.3%)	
Palate-cleft	N.A.	1 (14.3%)	3 (100.0%)	1 (7.1%)	
Lip-palate cleft	N.A.	1 (14.3%)	0 (0.0%)	11 (78.6%)	

N.A., not applicable; N.S., not significant.

Table 1: Maternal and prenatal characteristics according to prenatal type of orofacial cleft. Maternal, prenatal, and perinatal characteristics of the study population (n = 25) was stratified by prenatal diagnosis of isolated lip cleft, isolated palate cleft, and combined lip-palate cleft. Statistical analysis was performed as described in the Methods section.

Gestational Monitoring

Adequate gestational monitoring was documented in 23 pregnancies (92.0%), including all cases of lip and palate clefts (100% each) and 86.7% of lip–palate clefts; these differences were not statistically significant ($p = 0.485$) (Table 1).

Genetic Evaluation

Invasive prenatal testing was not performed in 3 cases (12.0%), all of which involved lip-palate clefts. Normal invasive testing results were obtained in 21 cases (84.0%), including all lip and palate cleft cases and 73.3% of lip-palate clefts. One abnormal invasive test result (4.0%) was identified, occurring exclusively in the lip-palate cleft group. No significant association was found between prenatal cleft type and the results of invasive prenatal testing ($p = 0.332$) (Table 1).

Nationality Distribution

Regarding maternal nationality, 19 mothers (76.0%) were Portuguese, while 6 (24.0%) were migrants. All cases of isolated lip cleft and palate clefts occurred in Portuguese mothers, whereas 40.0% of lip-palate clefts were observed in migrant mothers; however, this difference did not reach statistical significance. Although all cases in migrant mothers corresponded to combined lip–palate clefts, the association between prenatal cleft type and maternal nationality did not reach statistical significance using the Pearson chi-square test ($p = 0.072$), probably due to small sample size and low expected cell counts (Table 1).

Postpartum Diagnosis

The agreement between prenatal diagnosis and postnatal classification of orofacial clefts was evaluated in 24 cases with complete postnatal data (Table 1; one child was not yet born when the data were collected). Prenatally diagnosed isolated lip clefts (n = 7) were confirmed postnatally in 5 cases (71.4%). All prenatally diagnosed isolated palate clefts (n = 3) were confirmed after birth. Among prenatally diagnosed combined lip-palate clefts (n = 14), postnatal diagnosis confirmed this classification in 11 cases (78.6%). A statistically significant association was observed between prenatal and postnatal cleft classification ($p = 0.001$). However, these findings should be interpreted with caution, as 77.8% of contingency table cells had expected counts below 5. Despite this limitation, the results suggest a moderate-to-high level of concordance between prenatal ultrasound diagnosis and postnatal classification of orofacial cleft type (Table 1).

Parental Perception of the Prenatal Surgical Consultation

Twenty-three parents responded, by telephone, to the parental perception questionnaire (Table 2). Within the initial sample of 25 pregnant women, only 23 children's parents were contacted because: a) one had outdated phone numbers and the other, the child was not yet born.

#1. Information Sharing, Communication, and Support	**1**	**2**	**3**	**4**	**5**
I received clear explanations about the medical–surgical condition					
I had the opportunity to be heard and to ask questions					
I received direct answers to my questions					
I felt welcomed by the healthcare professional					
The information was provided in a respectful and understandable manner					
I was given sufficient information to make my own decisions					
#2. Adequate Time					
I had enough time during the prenatal consultation					
The healthcare professional seemed rushed					
There was time to talk with me about the impact of the prenatal diagnosis					
#3. Accessibility / Approachability					
The healthcare professional was unfriendly to me					
The healthcare professional made me feel as if I was wasting his/her time					
I was afraid to ask questions to the healthcare professional					
#4. Guidance and Referrals					
I received guidance on postnatal care (feeding bottles/teats, etc.)					
I was informed about surgical treatment and follow-up					
I was referred to a specialized service					
I received educational materials (printed/digital)					
The prenatal counseling gave me a clearer and more positive understanding of the condition and its multidisciplinary follow-up					
#5. Emotional Impact					
The consultation helped to reduce my anxiety					
I felt prepared for the birth					
#6. Support and Respect					
The healthcare professional respected and supported me during pregnancy					
The healthcare professional respected my knowledge					
My decisions were respected by the healthcare professional					
The healthcare professional was patient to me					
The healthcare professional paid attention while I was speaking					

My concerns were taken into consideration					
I felt comfortable with the healthcare professional					
My values and beliefs were respected by the healthcare professional					
#7. Overall Assessment **(1 – Very poor; 2 – Poor; 3 – Fair; 4 – Good; 5 – Very good)**					
Overall quality of the prenatal surgical counseling received					

Table 2: Structured and validated questionnaire, adapted for the context of prenatal surgical counseling for orofacial clefts. Parents were asked to indicate their experience using the scale provided. Responses were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). For the overall assessment of counseling quality, the scale ranged from 1 (very poor) to 5 (very good).

The questionnaire results indicate high satisfaction among participants regarding prenatal counseling, communication, and medical support (all: median of 5, IQR 5-5). Respondents reported receiving clear explanations, being listened to, and obtaining direct answers, with information provided in a respectful and understandable manner (all: median of 5, IQR 5-5). Appointment duration was generally adequate (all: median of 5, IQR 5-5), and negative experiences, such as feeling rushed or encountering medical antipathy, were minimal (all: median of 1, IQR 1-1). Participants also felt well-prepared for postnatal care, surgical treatment, and multidisciplinary follow-up, with educational materials provided (all: median of 5, IQR 5-5), High scores were reported for reducing parental anxiety, preparing for birth, and respecting parental knowledge, decisions, and beliefs (all: median of 5, IQR 5-5). Spearman correlation analyses were conducted to examine associations among maternal characteristics, counseling variables, and outcomes (Table 3).

Association analyzed	ρ	*p* value
Maternal age vs. Gestational age at diagnosis	-0.45	0.024
Guidance on postnatal care vs. Greater preparation for birth	0.55	0.006
Information on surgical treatment and follow-up vs. Greater preparation for birth	0.55	0.006
A clearer and more positive view of the disease and multidisciplinary follow-up vs. Greater preparation for birth	0.55	0.006
Adequate consultation time vs. Addressing the impact of prenatal diagnosis	0.665	< 0.001
Respect and medical support for the pregnant woman vs. Quality of prenatal surgical counselling	0.691	< 0.001
Provision of sufficient information vs. Reduced parental anxiety	0.796	< 0.001
Overall quality of prenatal surgical counseling vs. reduced parental anxiety	0.999	< 0.001

Table 3: Associations analyzed using the parental perception questionnaire, using Spearman's rank-order correlation. The table includes the variables analyzed, the correlation coefficients (ρ), and the corresponding *p* values.

Maternal age showed a moderate negative correlation with gestational age at diagnosis ($\rho = -0.450$, $p = 0.024$), indicating that older mothers tended to receive the prenatal diagnosis earlier. Measures related to birth preparation were strongly positively correlated with guidance on postnatal care, information on surgical treatment and follow-up, and a clearer and more positive understanding of the disease combined with multidisciplinary follow-up (all $\rho = 0.550$, $p = 0.006$). Adequate appointment duration was also strongly positively correlated with addressing the impact of prenatal diagnosis ($\rho = 0.665$, $p < 0.001$), and respect and medical support for the pregnant woman showed a strong positive correlation with the quality of prenatal surgical counseling ($\rho = 0.691$, $p < 0.001$). Provision of sufficient information was very strongly positively correlated with reduced parental anxiety ($\rho = 0.796$, $p < 0.001$), while overall quality of care exhibited an extremely strong positive correlation with reduced parental anxiety ($\rho = 0.999$, $p < 0.001$).

Neonatal and Perinatal Outcomes by Cleft Type

Gender distribution, gestational age at birth, the mode of delivery, the weight for gestational age and Apgar scores at 1, 5, and 10 minutes showed no significant differences (Table 4). Obstetric complications occurred in 25% of cases overall, and neonatal malformations diagnosed postnatally were reported in 33.3% of infants, with no significant differences among cleft types. Namely, in addition to orofacial clefts, eight newborns had other malformations, including ventriculomegaly, bilateral clubfoot, unilateral preauricular appendage, balanical hypospadias, sacrococcygeal dimple, pelvicalyceal dilatation, undescended testis, and Pierre Robin sequence. However, syndromic appearance was significantly more common in the palate cleft group (60.0%, $p = 0.012$). Postpartum complications, length of stay in the neonatal intensive care unit, and total hospitalization duration were similar among groups (Table 4). In fact, neonatal complications included transient hypoxemia, supplemental oxygen therapy, jaundice requiring phototherapy, choking, and, in one case, suspected neonatal seizures. Regarding feeding at discharge, breastfeeding rates varied by cleft type. Exclusive breastfeeding was most frequent in the lip cleft group (42.6%), while infants with palate or lip–palate clefts were more likely to receive mixed feeding methods. No significant differences were observed overall.

Variable	Total Results (n = 24; 100%)	Lip cleft (n = 7; 29.2%)	Palate cleft (n = 5; 20.8%)	Lip-palate cleft (n = 12; 50%)	*p* value
Gender					N.S.
Male sex (n) (%)	18 (75.0%)	5 (71.4%)	2 (40.0%)	11 (91.7)	
Gestational age at birth (weeks) (median; Q1-Q3)	39 (38.0-39.8)	39 (38.0-40.0)	39 (38.5-39.5)	38 (38.0-39.8)	N.S.
Mode of delivery (n) (%)					N.S.
Spontaneous vaginal delivery	8 (33.3%)	1 (14.3%)	3 (60.0%)	4 (33.3%)	
Instrumental vaginal delivery (vacuum/forceps)	7 (29.2%)	1 (14.3%)	2 (40.0%)	4 (33.3%)	
Caesarean delivery	9 (37.5%)	5 (71.4%)	0 (0.0%)	4 (33.3%)	
Weight for gestational age (n) (%)					N.S
Small	6 (25.0%)	2 (28.6%)	2 (40.0%)	2 (16.7%)	
Appropriate	17 (70.8%)	5 (71.4%)	3 (60.0%)	9 (75.0%)	
Large	1 (4.2%)	0 (0.0%)	0 (0.0%)	1 (8.3%)	
Apgar score ($1^{st}/5^{th}/10^{th}$ min) (median)	9/10/10	9/10/10	9/10/10	9/10/10	N.S.
Obstetric complications (n) (%)	6 (25%)	3 (42.9%)	0 (0.0%)	3 (25.0%)	N.S.

Neonatal malformations diagnosed postnatally (n) (%)	8 (33.3%)	1 (14.3%)	2 (40.0%)	5 (41.7%)	N.S.
Syndromic appearance (n) (%)	4 (16.7%)	0 (0.0%)	3 (60.0%)	1 (8.3%)	0.012
Postpartum complications (n) (%)	8 (33.3%)	2 (28.6%)	3 (60.0%)	3 (25.0%)	N.S.
Neonatal Intensive Care Unit stay (days) (median; Q1-Q3)	0 (0.0-2.8)	0 (0.0-1.0)	0 (0.0-10.5)	0 (0.0-2.3)	N.S.
Total hospitalization duration (days) (median; Q1–Q3)	3 (2.0-4.8)	3 (2.0-4.0)	3 (2.0-16.0)	3.5 (2.0-5.0)	N.S.
Feeding at discharge (n) (%)					N.S.
Breast milk (direct breastfeeding)	6 (25%)	3 (42.9%)	1 (20.0%)	2 (16.7%)	
Breast milk (adapted nipple/ bottle-fed)	3 (12.5%)	0 (0.0%)	1 (20.0%)	2 (16.7%)	
Formula milk (adapted nipple/bottle-fed)	5 (20.8%)	2 (28.6%)	0 (0.0%)	3 (25.0%)	
Formula milk (nasogastric tube)	1 (4.2%)	0 (0.0%)	1 (20.0%)	0 (0.0%)	
Mixed feeding (adapted nipple/bottle-fed)	9 (37.5%)	2 (28.6%)	2 (40.0%)	5 (41.7%)	

N.S., not significant.

Table 4: Neonatal and perinatal outcomes by cleft type. This table presents neonatal and perinatal outcomes stratified by cleft type (lip cleft, palate cleft, lip-palate cleft). Variables include demographic, clinical, and obstetric characteristics, as well as neonatal outcomes, feeding practices, and hospitalization data. Values are presented as number and percentage (n, %) for categorical variables and median with interquartile range (Q1–Q3) for continuous variables. Percentages are calculated based on the total number of cases in each cleft type category. Statistical analysis was performed as described in the Methods section.

Surgical Interventions and Postnatal Follow-up

Chi-square analyses were conducted to examine the associations between postnatal diagnosis type (lip cleft, palate cleft, lip-palate cleft) and surgical interventions or multidisciplinary follow-up (Table 5).

Variable	Total Results (n = 24; 100%)	Lip cleft (n = 7; 29.2%)	Palate cleft (n = 5; 20.8%)	Lip-palate cleft (n = 12; 50.0%)	*p* value
Cheiloplasty Surgery (n) (%)					**< 0.001**
Not performed	5 (20.8%)	0 (0.0%)	5 (100.0%)	0 (0.0%)	
Performed	16 (66.7%)	5 (71.4%)	0 (0%)	11 (91.7%)	
Awaiting	2 (8.3%)	2 (28.6%)	0 (0%)	0 (0.0%)	
Private follow-up	1 (4.2%)	0 (0.0%)	0 (0%)	1 (8.3%)	
Age at cheiloplasty (months) (median; Q1-Q3)	3.3 (3.0-3.6) (n=16)	3.3 (3.0-3.7) (n=5)	N.A.	3.4 (2.8-3.7) (n=11)	
Palatoplasty Surgery (n) (%)					0.006
Not performed	7 (41.7%)	7 (100%)	0 (0%)	0 (0%)	
Performed	10 (37.5%)	0 (0%)	2 (40.0%)	8 (66.7%)	
Awaiting	6 (25.0%)	0 (0%)	3 (60.0%)	3 (24.9%)	
Private follow-up	1 (4.2%)	0 (0%)	0 (0%)	1 (8%)	
Age at palatoplasty (months) (median; Q1-Q3)	12.9 (12.4-13.9) (n=10)	N.A.	12.3 (N.A.) (n=2)	13.1 (12.5-14.0) (n=8)	
Multidisciplinary hospital follow-up (n) (%)					0.056
Not performed	4 (16.7%)	3 (42.9%)	0 (0%)	1 (8.3%)	
Performed	17 (70.8%)	3 (42.9%)	4 (80.0%)	10 (83.3%)	
Private follow-up	1 (4.2%)	0 (0%)	1 (20.0%)	1 (8.3%)	
Awaiting	1 (4.2%)	1 (14.3%)	0 (0%)	0 (0%)	

N.A., not applicable

Table 5: Surgical interventions and postnatal follow-up by cleft type. Variables include the performance status of surgeries, timing, and type of follow-up. Values for categorical variables are presented as number of cases and percentage (n, %). Continuous variables are presented as median with interquartile range (Q1-Q3). Percentages are calculated relative to the total number of cases in each cleft type. Statistical analysis was performed as described in the Methods section.

As expected, a cross-tabulation showed that cheiloplasty performance varied by cleft type. The Pearson Chi-square test indicated a statistically significant association between postnatal diagnosis type and cheiloplasty surgery ($p < 0.001$). Also, cross-tabulation revealed that palatoplasty performance also differed by cleft type. Pearson Chi-square analysis showed a significant association ($p = 0.006$), indicating a trend across diagnosis categories. About multidisciplinary follow-up at the hospital, the cross-tabulation suggested variation in follow-up across cleft types, suggesting a possible association, although the Pearson chi-square test did not reach statistical significance ($p = 0.056$).

Weight Evolution by Cleft Type

Weight evolution did not differ significantly among cleft types (Table 6).

Variables	Total Results	Lip cleft	Palate cleft	Lip-palate cleft	*p* value
Weight evolution (n) (%)					N.S.
Birth percentile (median; Q1-Q3) (n=24; n=7; n=5; n=12)	29.5 (9.8-56.8) (n = 24)	30 (5.0-60.0) (n = 7)	18 (2.0-28.5) (n = 5)	47.5 (13.0-63.8) (n = 12)	
Pre-cheiloplasty percentile or 3-month percentile (median; Q1-Q3)	30 (21.0-57.5) (n = 17)	31 (25.0-68.5) (n = 5)	56.5 (16.0-N.A.) (n = 2)	28.5 (21.0-54.0) (n = 10)	
6-month percentile (median; Q1-Q3)	32.5 (21.3-40.3) (n = 16)	30 (10.8-42.5) (n = 4)	61 (34.0-N.A.) (n = 2)	32 (21.0-38.0) (n = 10)	
9-month percentile (median; Q1-Q3)	31 (15.5-63.5) (n = 13)	30 (14.0-N.A.) (n = 3)	19 (N.A.) (n = 1)	31 (14.0-63.5) (n = 9)	
Pre-palatoplasty percentile or 12-month percentile (median; Q1-Q3)	27 (9.8-59.0) (n = 10)	46 (9.0-N.A.) (n = 2)	27 (N.A.) (n = 1)	27 (10.0-59.0) (n = 7)	
18-month percentile (median; Q1-Q3)	44 (17.5-71.0) (n = 9)	45.5 (13.0; N.A.) (n = 2)	22 (N.A.) (n = 1)	53 (31.8-70.8) (n = 5)	
24-month percentile (median; Q1-Q3)	62 (33.0-85.0) (n = 7)	58.5 (33.0; N.A.) (n = 2)	36 (N.A.) (n = 1)	73.5 (16.3-91.0) (n = 4)	

N.A., not applicable; N.S., not significant.

Table 6: Weight Evolution by Cleft Type. Data are presented as median (Q1-Q3) or n (%) as indicated. The table summarizes weight evolution in children according to cleft type (lip cleft, palate cleft, lip-palate cleft) at various time points: at birth, pre-cheiloplasty or 3 months, at 6 months, at 9 months, pre-palatoplasty or 12 months, at 18 months, and at 24 months. Sample sizes for each time point and cleft type are provided. Statistical analysis was performed as described in the Methods section.

Median birth percentiles were 29.5 overall, with higher median percentiles in the lip-palate cleft group (percentile 47.5) and lower in the palate cleft group (percentile 18.0). Before cheiloplasty, the median percentile was 30.0 overall, with the palate cleft group showing higher values (percentile 56.5) compared to the lip-palate cleft group (percentile 28.5). After cheiloplasty, at 6 months, the overall median percentile was 32.5, remaining relatively stable across groups. At 9 months, the median percentile was 31.0, with similar trends among lip and lip-palate cleft types. Before palatoplasty, the median percentile for the small subset of patients was 27.0 overall. By 18 months, the median weight percentile increased to 44.0 overall, with the highest median in the lip–palate cleft group (percentile 53.0). At 24 months, the overall median percentile was 62.0, again with higher values in the lip-palate cleft group (percentile 73.5) and lower in the palate cleft group (percentile 36.0).

Discussion

In this cohort of prenatally diagnosed orofacial clefts, maternal age, family history, and gestational age at diagnosis did not differ significantly among cleft types, consistent with the multifactorial etiology involving genetic and environmental factors [2,3,12,13]. Over the past five years, 64 new cases of orofacial clefts were identified at initial plastic surgery appointments; however, only 37.5% (n = 25) was previously referred for surgical counseling at our hospital (*data not shown*). Among the remaining 39 cases, 66.7% (n = 26) lacked a prenatal ultrasound diagnosis of orofacial cleft (*data not shown*). Prenatal ultrasound detected most clefts at a median gestational age of 22 weeks, with significant concordance between prenatal and postnatal classification (p = 0.001), particularly for palate clefts, which contrasts with some previous reports [7,8]. Factors such as advances in imaging, examiner experience, and classification criteria may explain these differences. Genetic evaluation revealed mostly normal results (84.0%), with only one syndromic case, highlighting the relevance of genetic counselling [9,12]. This reinforces the importance of genetic counseling and the potential contribution of syndromic associations in the management of orofacial clefts [9,12]. The study population was predominantly of Portuguese nationality (76.0%), with a geographically dispersed distribution (*data not shown*). In fact, geographic variation in the prevalence and distribution of lip and/or palate clefts subtypes has been reported, suggesting that genetic diversity, environmental exposures, healthcare access, and sociodemographic factors may influence the frequency of specific cleft types [13-17]. Parental perception of prenatal surgical counseling was overwhelmingly positive, with high scores for clarity, respect, multidisciplinary guidance, and reduced anxiety. Correlation analyses confirmed associations between counseling quality and improved parental adaptation and preparedness (ρ = 0.691–0.999, $p < 0.001$). These findings support previous evidence that structured, empathetic prenatal counseling improves parental emotional adaptation and preparedness [8,10,18]. Neonatal outcomes were consistent with published literature, namely, gestational age at birth, mode of delivery, Apgar scores, and weight-for-gestational age did not differ significantly among cleft types. Syndromic appearance was significantly more common in the palate cleft group (75.0%, p = 0.012), and postoperative feeding practices varied according to cleft type, with exclusive breastfeeding most frequent in the lip cleft group [19-22]. No significant differences in weight evolution were observed between cleft subtypes during first 24 months of life, although children with lip-palate clefts had higher median percentiles at 18-24 months, reflecting effective multidisciplinary nutritional and surgical care [20,22]. Surgical management followed expected patterns. Namely, cheiloplasty and palatoplasty showed significant differences among cleft types (respectively, $p < 0.001$ and p = 0.006), as expected. Multidisciplinary hospital follow-up in our hospital was performed in 70.8% of cases, although the Pearson chi-square test did not reach statistical significance between cleft types (p = 0.056). Multidisciplinary hospital follow-up reflects the complexity of cleft care, which often requires coordinated input from surgeons, speech therapists, orthodontists, and other specialists. Established protocols in specialized centers recommend multidisciplinary assessment to optimize functional and aesthetic outcomes. The remaining 29.2% of patients may not have received follow-up in our hospital due to logistical, socioeconomic, or access-related barriers.

Limitations

Limitations include the small sample size, particularly by cleft subtype, and the single-center design, which may affect generalizability. Also, variability in ultrasound technique and operator experience could influence diagnostic accuracy, especially for isolated palate clefts. Recall bias may have influenced parental recollection of prenatal counseling experiences. Parents may tend to provide favorable responses regarding healthcare professionals. Findings may not be generalizable to other institutions with different counseling models.

Clinical Relevance

The findings support the value of comprehensive prenatal diagnosis and counseling, highlighting that early and clear communication, respect for parental concerns, and multidisciplinary planning was associated with lower reported parental anxiety, improve preparedness for postnatal care, and enhance engagement with the care pathway. Prenatal detection of orofacial clefts allows for early multidisciplinary planning, including nutritional support, surgical scheduling, and genetic evaluation, which can optimize neonatal outcomes and streamline care. Additionally, the weight evolution data reinforce the need for specialized feeding support, particularly in infants with palatal involvement, to ensure adequate growth. Finally, these results contribute to evidence-based counseling and care strategies in cleft care programs, emphasizing patient-centered communication and tailored multidisciplinary follow-up.

Conclusions

These results highlight the importance of early, structured prenatal counseling, multidisciplinary follow-up, and individualized surgical planning for children with orofacial clefts. They also reinforce that parental perception of care and emotional support is a critical component in optimizing outcomes for both infants and families.

Declarations and Statements

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Author Contributions

All authors contributed to the study conception and design. Data preparation, collection, and analysis were performed by Ana Burgeiro, Liliana Santos and Vanda Conceição. The first draft of the manuscript was written by Ana Burgeiro, and all authors provided feedback on previous versions. All authors read and approved the final manuscript.

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