Published in final edited form as:

Plast Reconstr Surg. 2014 June ; 133(6): 828e–834e. doi:10.1097/PRS.0000000000000221.

Examining Factors Associated with Oral Health-Related Quality of Life for Youth with Cleft

Hillary L. Broder, PhD, MEd^a, Maureen Wilson-Genderson, PhD^b, Lacey Sischo, PhD^a, and Robert G. Norman, PhD^c

^aNew York University College of Dentistry Department of Comprehensive Care 380 2nd Avenue, Suite 301 New York, NY 10010

^bVirginia Commonwealth University School of Medicine Department of Social and Behavioral Health 830 E. Main Street Richmond, VA 23219

^cNew York University College of Dentistry Department of Epidemiology and Health Promotion 250 Park Ave South, 6th Floor New York, NY 10003

Abstract

Background—Patient-reported quality of life (QoL) outcomes in cleft lip and palate treatment are critical as we advance evidence-based care. To date, scant data exist analyzing cleft treatment from the patients' perspective. The purpose of this manuscript is to examine the interrelationship among variables associated with oral health-related quality of life (OHRQoL) among youth with cleft.

Methods—As part of an ongoing longitudinal study among school-aged youth with cleft, clinical evaluations and research questionnaire packets were completed prior to a determination of surgical recommendation status (baseline). Participants completed the Child Oral Health Impact Profile (COHIP), a validated OHRQoL measure for children with cleft, as part of their clinical appointments. During the participants' baseline clinical evaluations, plastic surgeons determined whether surgical interventions were recommended within the year (the expert determination of such represents a greater degree of current clinical need). General linear models (GLM) incorporating surgical recommendation, gender, and age were fit for each COHIP subscale and for the total COHIP. Significant interaction terms were evaluated for their effect on the COHIP subscale.

Results—Baseline assessments were obtained from 1,200 participants ($\bar{x}$ =11.8 years; 57% male). GLM analysis showed that participants with a surgical recommendation had lower QoL on all but the Self-Esteem subscale compared to those without a surgical recommendation ($p<0.002$). Two subscales had statistically significant age-gender interactions ($p<0.003$), while another subscale had a statistically significant surgery by gender interaction term ($p=0.027$).

Corresponding Author: Hillary L. Broder 380 2nd Avenue, Suite 301 New York, NY 10010-5615 212-998-9806
hillary.broder@nyu.edu.

All authors declare no conflict of interest.

Statement of Author Role/Participation:

Hillary L. Broder participated in concept formation and manuscript preparation. Maureen Wilson-Genderson and Robert G. Norman participated in data analysis and manuscript preparation. Lacey Sischo participated in manuscript preparation.

Conclusions—Overall, youth currently recommended for surgery had lower OHRQoL scores on the COHIP Total scale than those with no surgical recommendation; older females had lower QoL scores than males.

Introduction

Since cleft lip and palate (CLP) is the second most common birth defect [1] and the most common congenital craniofacial anomaly [2, 3], understanding oral health-related quality of life (OHRQoL) in children with cleft is extremely important. OHRQoL, a multidimensional construct, includes how the patient feels about his/her condition and how it is affecting his/her overall well-being. Given the core quality of life (QoL) issues in this patient population (e.g., eating, talking, facial appearance, bone growth), as well as our professional responsibility to report patient outcomes measurements, interest in this area is paramount. In fact, health related quality of life (HRQoL) measures are used in almost every area of patient care [4]. For example, the Child Oral Health Impact Profile (COHIP), a patient-oriented OHRQoL assessment, was validated for children ages 7-18 with oral health conditions, including CLP [5]. The COHIP, which has undergone vigorous validation and reliability studies [6], has been used in several QoL studies among people with varying oral health needs. QoL data, like that obtained using the COHIP, are a key determinant in evaluating health status among children seeking care for chronic conditions such as cleft. Further, the COHIP is currently being used in an NIH-supported, six center study to measure OHRQoL outcomes following secondary surgical procedures like lip/nose revisions.

Habilitation for cleft begins in infancy and often lasts into young adulthood. While primary surgical interventions are completed in early childhood, children with cleft experience assessments and treatments that focus on tooth development, speech, and facial appearance throughout their school-age years until the habilitation process is complete. Treatment often includes secondary surgical procedures aimed at improving functional and/or aesthetic outcomes related to physical and socio-emotional well-being. In fact, surgeons' rationale for secondary cleft surgical recommendations is often associated with improving patients' QoL. Yet, little is known about the OHRQoL of these youth as they go through the cleft habilitation process in general and the impact of secondary surgeries on OHRQoL in particular.

Little is also known about age and gender differences in OHRQoL for youth receiving clinical care for oral-facial anomalies. There is evidence from other areas of research to suggest the need to examine possible differences in OHRQoL associated with age and gender for these youth. For example, gender differences in body image are known to exist [7] and vary along the adolescent developmental trajectory [8]. Examining these characteristics in tandem with current clinical status will provide important information which can help alert clinicians to potentially heightened vulnerability and inform future research in this area. This study uses the COHIP to compare the OHRQoL of youth with cleft who are currently recommended for secondary surgery with those who are not and examines the associations between OHRQoL and age and gender.

Methods

The sample consists of 1200 school-aged English- or Spanish-speaking youth ages 7-19 with cleft who are followed for care at one of six well-established and geographically diverse cleft/craniofacial centers: Children's Healthcare of Atlanta (CHOA), Children's Hospital of Philadelphia (CHOP), Lancaster Cleft Palate Clinic (LCP), New York University (NYU), University of Illinois at Chicago (UIC), and University of North Carolina-Chapel Hill (UNC). The sites' catchment areas include both rural and urban locations. As per IRB-approved protocols, data were collected between December 2009 and March 2011 at the children's regularly-scheduled clinic visits with youth completing the COHIP packet and caregivers providing demographic information. All participants completed written informed consent and assent as per IRB regulations. The recruitment response rate across centers averaged 90% (range: 78-95%).

Data collected from the surgeon included a rating of the extent of the defect of the nose and the extent of the defect of the lip. Both were reported on the same response scale (0 = no difference, 1 = mild, 2 = moderate, 3 = severe difference). Data collected from the clinical record also included whether the multi-disciplinary team determining care (as per ACPA parameters [9]) recommended surgery for the patient within the next year.

The COHIP is a 34-item, self-report OHRQoL measure with five discrete subscales: *Oral Health* (varied/specific oral symptoms); *Functional Well-being* (ability to carry out specific functional tasks like eating); *Socio-Emotional Well-being* (peer interactions and mood states); *School/Environment* (tasks associated with the school environment); and *Self-esteem* (positive feelings about oneself). It uses a 5-point Likert scale with higher scores indicating better QoL. The COHIP has been shown to have excellent scale (Cronbach's alpha coefficient = 0.91) and test-retest (ICC = 0.84) reliability, and both discriminant and concurrent validity have been supported [5, 10]. It has also been translated into multiple languages, including Spanish, French, Korean, Dutch, etc., and has been used in a variety of research applications, including epidemiological and outcomes studies [11, 12]. See Table 1 for the COHIP items.

Analysis

The dataset analyzed represents baseline data collected prior to a determination of surgical recommendation status from an ongoing longitudinal study of QoL in youth with cleft. Participants completed the COHIP, which was scored according to standard scoring criteria, including a minimum number of item responses (generally 75%) for each scale to be calculated. Demographic characteristics, along with diagnosis and surgeon's severity rating of nose and lip, for the sample were summarized with mean/standard deviation or frequency/percent as appropriate in relation to the data type. Comparison of age and severity of nose and lip between those subjects recommended for surgery and those not recommended for surgery was performed by independent samples T test. The distributions of gender, diagnosis, and race were compared between these two groups using Pearson's Chi Square test. For each subscale and the total scale, a general linear model (GLM) was fit using gender, age, and surgical recommendation as main effects and including all two-way

interaction terms. Type III sums of squares were used to generate significance values. A multiple comparison adjustment was performed across scales (GLMs). For the 5 subscales plus total score a Bonferroni adjusted significance value of 0.00833 was used within each GLM. For significant interaction terms involving age, an appropriate subsequent analysis was conducted using either simple effects when both factors of the interaction term were nominal or separate linear regressions within each level of nominal variables in order to determine the nature of the effect. If a significant interaction term containing an effect was found, the main effect for that variable was not interpreted in keeping with standard practice. All GLM models were then re-run to include the surgeon's rating of the severity of nose defect and (separately) the surgeon's rating of the severity of lip defect. There was a significant main effect for nose and lip severity for Socio-Emotional, Self-esteem and Total COHIP and a significant main effect for lip severity for Oral Symptoms and Functional Well-being. Inclusion of these severity ratings did not alter the magnitude or substantive interpretation of the other effects in the GLM models. For sake of parsimony, severity ratings were not retained in the models. All scoring and analysis was performed using SAS 9.3 (Cary, NC).

Results

The description of the sample of 1200 participants is provided in Table 2. The table is oriented around the recommendation for surgery as this is one of the major interests of the study. There was no significant difference in age between the two recommendation groups (recommended for surgery within 1 year versus not recommended for surgery) ($T=-1.59$, $df=1198$, $p=0.112$). There was no significant difference in gender distribution between the groups ($\chi^2=0.073$, $df=1$, $p=0.787$). As expected, however, there was a significant difference in diagnosis ($\chi^2=38.053$, $df=1$, $p<0.0001$) with a greater percentage of youth with cleft lip and palate in the surgical recommendation group than in the surgery not recommended group. There was also a higher rating by the surgeons for both nose ($T=5.96$, $df=1177$, $p<0.0001$) and lip ($T=6.50$, $df=1177$, $p<0.0001$) severity for patients recommended for surgery. Finally, there was also a significant difference in racial distribution between the groups ($\chi^2=13.134$, $df=3$, $p=0.004$) with a greater proportion of minorities recommended for surgery (38% versus 29%).

Table 3 shows the summary results of the GLMs for each subscale and the Total COHIP scale. The Oral Symptoms subscale showed a statistically significant effect of surgical recommendation. Those with a surgical recommendation had lower mean scores (24.4 ± 6.4) on the Oral Symptoms subscale than those without a recommendation (25.8 ± 6.4). No significant effects of age, gender, or interactions among the factors were found. The Functional Well-being subscale showed a statistically significant effect for surgical recommendation such that those with a surgical recommendation had lower mean scores (17.2 ± 4.6) on the Functional Well-being subscale than those without (18.3 ± 4.5). No significant effects of age, gender, or interactions among the factors were found.

For the Socio-Emotional Well-being subscale, once again a statistically significant effect of surgical recommendation was found (21.8 ± 7.6 for those with a surgical recommendation compared to 24.4 ± 7.0 for those without). Unlike the previous subscales, a significant

interaction term for age by gender was observed. Post-hoc analyses show that the reduction in score for each additional year of age is greater (-0.68) in females than in males (-0.25); in other words, while Socio-Emotional Well-being scores for both males and females decrease as they age, the decrease is larger for girls than for boys. In light of the significant interaction involving age and gender, the main effect of age cannot be fully interpreted even though it is statistically significant.

For the School/Environmental subscale, there were significant effects for surgical recommendation, with post hoc analyses showing that those with a surgical recommendation have lower mean School/Environment scores (13.0 ± 3.0) than those without (13.6 ± 2.8). Additionally, an age by gender interaction was found indicating that females have a significant reduction in their score on this subscale of -0.14 per year of age while males have no difference in score with age. According to this finding, girls' (but not boys') School/Environmental scores decrease as they age. For the Self-esteem subscale, there was a statistically significant main effect for gender such that males had lower scores on this subscale (16.7 ± 4.6) than females (17.2 ± 4.5).

Finally, for the Total COHIP score there were statistically significant main effects for surgical recommendation and age. Post hoc analysis showed that the surgical recommendation group had a lower mean score (93.2 ± 19.0) than those subjects not recommended for surgery (99.0 ± 18.3); there was also a reduction of -0.73 Total score points per year of age.

Discussion

In this study of 1,200 youth with cleft, those youth for whom surgery was recommended within one year had significantly lower QoL on the Total COHIP and each COHIP subscale, except Self-Esteem, than those without such a recommendation. The results of the GLM analyses in terms of the significance of surgical recommendation are quantitatively similar to the results obtained with simple independent samples T tests. However, difference in age and gender may have influenced the simpler result. So, in addition to looking at differences only in terms of surgical recommendation, we also evaluated the effect of demographics in terms of age and gender. Two COHIP subscales (Socio-Emotional Well-being and School/Environment) reveal an age by gender interaction, which means females have greater reductions in score with increasing age than males. One possible interpretation of this is that gender differences in body image peak during early to mid-adolescence [13]. Thus, higher levels of body image dissatisfaction coupled with increased appearance anxiety related to their cleft [14, 15] might help explain lower QoL in females as they age compared to males. During adolescence, issues related to attractiveness, peer acceptance, and identity formation are especially salient for both the general and cleft populations [16]. Those individuals with cleft, however, have to cope with facial difference in addition to typical adolescent concerns regarding facial attractiveness and social acceptance. While research suggests that "the majority of children and adults with CLP do not appear to experience major psychosocial problems" [17], our results indicate that females' OHRQoL decreases with age while males' QoL does not. This finding supports research on gender differences among adolescents [18]. It is important to note that for those scales with significant age by gender interaction terms,

it is not possible to “adjust” for age using the usual ANCOVA technique as the existence of the interaction indicates that the effect of age on outcome differs between males and females. Thus, no one regression slope can characterize the relationship for all participants.

Finally, even though some have argued that a dearth of patient-reported outcomes measures for children with cleft currently exists [3, 19], our study further indicates that the COHIP is an appropriate measure of OHRQoL for children with CLP. The COHIP is unique in two ways: 1) it is a condition-specific instrument that uses both positive and negative constructs to measure OHRQoL, and 2) it was validated with a diverse sample of children, including children with cleft [5]. Using a condition-specific measure like the COHIP instead of a generic instrument is advantageous because it is “focused on a specific condition, oral health, and appears to have increased sensitivity to treatment effects,” which ultimately increases patient responsiveness [10, 20]. Further, the COHIP allows for comparisons with other groups that have an oral-facial difference (e.g., patients with burns or those with functional defects only). In sum, during this time of evidence-based care, the COHIP is a psychometrically sound analytic tool that is able to evaluate treatment efficacy in relation to OHRQoL.

One issue with a study of 1200 subjects is that it may be considered over-powered and as a result small, clinically irrelevant effects might be statistically detected. Certainly some of the differences are quite small, but others are not. For example, the age by gender interaction for the Socio-Emotional scale of the COHIP (which showed $-0.68/\text{year}$ for females and $-0.25/\text{year}$ for males) is a difference of 4.3 in 10 years on a scale that ranges from 0-28 (or a 15% difference in score from age alone). Regarding the age-interaction effects, while such results are inconclusive, there may be significant implications for the timing of surgery, which is critical for this population who receives ongoing care. Future longitudinal analyses will permit examining the impact of surgical interventions on QoL. These analyses may also be able to identify optimal times for certain types of plastic surgery interventions (e.g., lip/nose revisions, secondary palate repairs) on QoL outcomes.

One limitation of the present findings concerns the fact that a surgeon's “recommendation for surgery” is not a fully “objective” outcome. When seeing a patient, the plastic surgeon not only assesses the physical disability/difference(s) (e.g., malocclusion, bad scar, asymmetric lip/nose) but also the patient's perceptions (QoL) regarding said physical difference. All of these factors, as well as the individual surgeon's confidence in “making a significant difference” surgically and his/her comfort with the possible success of the procedure, all go into the decision to “recommend surgery”. A second limitation of the current results is that we are unable to predict who or what happens as a result of surgery. However, this study provides the foundation for future outcomes that will provide key evidence-based data for patients considering secondary revisions. It is extremely important for clinicians to fully recognize that multiple factors may be associated with current QoL status and that responses to surgery may differ by gender, age, or type and number of previous procedures. This study highlights the importance of ascertaining QoL assessments prospectively to clearly measure the subjective perceptions of the patients and their caregivers.

Our findings underscore that OHRQoL varies by surgical recommendation such that youth with cleft who are recommended for surgery have lower OHRQoL than their non-surgical counterparts. Future research should examine the effect of surgery on OHRQoL and determine if having surgery can indeed improve adolescents' OHRQoL. At this time when health metrics are in place, evidence-based care is salient to our success in treating patients—not merely millimeters of tissue or bone—but whether the patient reports an improved sense of well-being. To put this into context, given the importance of verbal communication and facial attractiveness in this culture, the changes associated with secondary surgery reflect our value system and likely should not be considered elective.

In closing, it should be noted that a shortened, validated version of the COHIP consisting of 19 questions also exists [21] (see Table 1 for items). The COHIP-SF19 will enable more centers to assess OHRQoL as it is a self-administered measure that can be completed in less than 10 minutes. Such a brief measure may be extremely useful to quantify outcomes in patients undergoing plastic surgery for functional and/or aesthetic defects pertaining to the teeth, mouth or face.

Acknowledgments

This research was supported by NIH/NIDCR grant #DE018729 (H. Broder, PI). We thank the research team members at our six study sites: Children's Healthcare of Atlanta (John Riski, PI), Children's Hospital of Philadelphia (Canice Crerand, PI), Lancaster Cleft Palate Clinic (Ross Long, PI), New York University Langone Medical Center (Barry Grayson and Stephen Warren, PIs), University of Illinois at Chicago (Janine Rosenberg, PI), and University of North Carolina-Chapel Hill (Margot Stein, PI). We also greatly appreciate the children and caregivers for their willingness to participate.

References

1. Parker SE, Mai CT, Canfield MA, Rickard R, Wang Y, Meyer RE, et al. Updated National Birth Prevalence Estimates for Selected Birth Defects in the United States, 2004-2006. *Birth Defects Research Part a-Clinical and Molecular Teratology*. 2010; 88(12):1008–1016.
2. Dixon MJ, Marazita ML, Beaty TH, Murray JC. Cleft lip and palate: understanding genetic and environmental influences. *Nature Reviews Genetics*. 2011; 12(3):167–178.
3. Klassen AF, Tsangaris E, Forrest CR, Wong KWY, Pusic AL, Cano SJ, et al. Quality of life of children treated for cleft lip and/or palate: A systematic review. *Journal of Plastic Reconstructive and Aesthetic Surgery*. 2012; 65(5):547–557.
4. Patrick DL, Topolski TD, Edwards TC, Aspinall CL, Kapp-Simon KA, Rumsey NJ, et al. Measuring the quality of life of youth with facial differences. *Cleft Palate-Craniofacial Journal*. 2007; 44(5):538–47. [PubMed: 17760483]
5. Broder HL, Wilson-Genderson M. Reliability and convergent and discriminant validity of the Child Oral Health Impact Profile (COHIP Child's version). *Community Dent Oral Epidemiol*. 2007; 35(Suppl 1):20–31. [PubMed: 17615047]
6. Broder HL, McGrath C, Cisneros GJ. Questionnaire development: face validity and item impact testing of the Child Oral Health Impact Profile. *Community Dent Oral Epidemiol*. 2007; 35(Suppl 1):8–19. [PubMed: 17615046]
7. Feragen KB, Kvale IL, Rumsey N, Borge AIH. Adolescents with and without a facial difference: The role of friendships and social acceptance in perceptions of appearance and emotional resilience. *Body Image*. 2010; 7(4):271–279. [PubMed: 20541483]
8. Rumsey N, Harcourt D. Body image and disfigurement: issues and interventions. *Body Image*. 2004; 1(1):83–97. [PubMed: 18089143]

9. American Cleft Palate Association. Parameters for the evaluation and treatment of patients with cleft lip/palate or other craniofacial anomalies. *Cleft Palate Craniofac J.* 1993; 30(Suppl 1) Revised Edition--November 2009.
10. Dunlow N, Phillips C, Broder HL. Concurrent validity of the COHIP. *Community Dentistry and Oral Epidemiology.* 2007; 35(Suppl 1):41–9. [PubMed: 17615049]
11. Ahn YS, Kim HY, Hong SM, Patton LL, Kim JH, Noh HJ. Validation of a Korean version of the Child Oral Health Impact Profile (COHIP) among 8- to 15-year-old school children. *International Journal of Paediatric Dentistry.* 2012; 22(4):292–301. [PubMed: 22092665]
12. Slade GD, Reisine ST. The child oral health impact profile: current status and future directions. *Community Dent Oral Epidemiol.* 2007; 35(Suppl 1):50–3. [PubMed: 17615050]
13. Feingold A, Mazzella R. Gender differences in body image are increasing. *Psychological Science.* 1998; 9(3):190–195.
14. Broder HL, Smith FB, Strauss RP. Effects of Visible and Invisible Orofacial Defects on Self-Perception and Adjustment across Developmental Eras and Gender. *Cleft Palate-Craniofacial Journal.* 1994; 31(6):429–436. [PubMed: 7833334]
15. Kapp-Simon KA. Psychological interventions for the adolescent with cleft lip and palate. *Psychological Interventions.* 1995; 32(2):104–108.
16. Kapp-Simon KA, Simon DJ, Kristovich S. Self-perception, social skills, adjustment, and inhibition in young adolescents with craniofacial anomalies. *Cleft Palate Craniofac J.* 1992; 29(4):352–6. [PubMed: 1643066]
17. Hunt O, Burden D, Hepper P, Johnston C. The psychosocial effects of cleft lip and palate: a systematic review. *European Journal of Orthodontics.* 2005; 27(3):274–285. [PubMed: 15947228]
18. Eiser C, Morse R. Can parents rate their child's health-related quality of life? Results of a systematic review. *Qual Life Res.* 2001; 10(4):347–57.
19. 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. *Plastic and Reconstructive Surgery.* 2011; 128(5):518e–526e. [PubMed: 21788843]
20. Broder HL, Norman RG, Sischo L, Wilson-Genderson M. Evaluation of the similarities and differences in response patterns to the Pediatric Quality of Life Inventory and the Child Oral Health Impact Scores among youth with cleft. *Qual Life Res.* 2013
21. Broder HL, Wilson-Genderson M, Sischo L. Reliability and validity testing for the Child Oral Health Impact Profile-Reduced (COHIP-SF 19). *Journal of Public Health Dentistry.* 2012; 72(4): 302–12. [PubMed: 22536873]

Table 1

Child Oral Health Impact Profile original and Short Form (++) indicates items retained in short form)

Oral Symptoms
++Had pain in your teeth/toothache.
Been breathing through your mouth or snoring.
++Had discolored teeth or spots on your teeth.
++Had crooked teeth or spaces between your teeth.
Had sores or sore spots in or around your mouth.
++Had bad breath.
++Had bleeding gums.
Had food sticking in or between your teeth.
Had pain or sensitivity in teeth with hot or cold things.
Had dry mouth or lips.
Functional Well-being
Had trouble biting off or chewing foods such as apple, carrot or firm meat.
++Had difficulty eating foods you would like to eat
++Had trouble sleeping ¹
++Had difficulty saying certain words
Had people have difficulty understanding what you were saying.
++Had difficulty keeping your teeth clean
Social-Emotional Well-being¹
++Been unhappy or sad
++Felt worried or anxious
++Avoided smiling or laughing with other children
++Felt that you look different
++Been worried about what other people think about your...
Felt shy or withdrawn
++Been teased, bullied or called names by other children
Been upset or uncomfortable with being asked questions about your...

<u>School/Environment</u> [/]	
++Missed School for any reason	
Had difficulty paying attention in school	
++Not wanted to speak/read out loud in class	
Not wanted to go to school	
<u>Self-Esteem</u> [/]	
++Been confident	
++Felt that you were attractive (good looking)	
I have good teeth.	
I feel good about myself.	
When I am older, I believe (think) that I will have good teeth.	
When I am older, I believe (think) that I will have good health.	
[/] Questions finish with "because of your teeth, mouth, or face".	

Table 2

Description of Study Sample

	Age	Gender	Diagnosis	Race	Severity of Nose Defect	Severity of Lip Defect
Surgery Recommended (n=434)	11.8±3.3	M 246 (57%) F 188 (43%)	CPO 60 (14%) CLP 374 (86%)	African American 50 (12%) Asian 57 (13%) White 269 (62%) Other 58 (13%)	1.25±.84	1.18±.76
Surgery Not Recommended (n=766)	11.5±3.0	M 428 (56%) F 338 (44%)	CPO 227 (30%) CLP 539 (70%)	African American 78 (10%) Asian 60 (8%) White 544 (71%) Other 84 (11%)	.95±.85	.88±.78
Total (n=1200)	11.6±3.1	M 674 (56%) F 526 (44%)	CPO 287 (24%) CLP 913 (76%)	African American 128 (11%) Asian 117 (10%) White 813 (68%) Other 142 (12%)	1.06±.86	.99±.79

CPO = Cleft Palate Only

CLP = Cleft Lip and Palate

Table 3

COHIP – p values of main and interaction effects from GLM for each subscale.

COHIP Subscales	N	Gender p	Age p	Surgery p	Surgery by Gender p	Age by Surgery p	Age By Gender p
Oral Symptoms	1185	0.434	0.017	0.001	0.189	0.449	0.964
Functional Well-being	1189	0.887	0.931	0.001	0.577	0.662	0.188
Socio-Emotional Well-being	1188	0.035	0.001	0.001	0.050	0.215	0.002
School /Environmental	1188	0.912	0.542	0.002	0.883	0.156	0.003
Self-Esteem	1186	0.006	0.130	0.313	0.027	0.347	0.264
TOTAL COHIP	1190	0.932	0.003	0.001	0.061	0.593	0.029