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# Assessment of the quality of life of children with congenital cleft lip and palate and associated dental diseases

Tetiana O. Timokhina<sup>1</sup>, Olena V. Anoprienko<sup>2</sup>, Anastasiia Y. Tokarchuk<sup>2</sup>,  
Kateryna L. Yurtschenko<sup>2</sup>, Bohdan M. Melnyk<sup>1</sup>

<sup>1</sup>DEPARTMENT OF DENTAL THERAPY, BOGOMOLETS NATIONAL MEDICAL UNIVERSITY, KYIV, UKRAINE

<sup>2</sup>NATIONAL SPECIALIZED CHILDREN'S HOSPITAL "OKHMATDYT", KYIV, UKRAINE

## ABSTRACT

**Aim:** To evaluate of the quality of life in children with cleft lip and palate and concomitant diseases of the tissues of the oral cavity.

**Materials and Methods:** 66 children with cleft lip and palate and concomitant diseases of the oral cavity tissues participated in the research. In this study was made a dental examination, study of quality of life together with socialization and social adaptation according to T. Dembo and S. Rubinstein self-worth assessment technique modified by A. Prikhozhan; assessment of emotional state according to the NADS method; assessment of O.Chaban Quality of Life Scale Method.

**Results:** Children with cleft lip and palate at the younger age had higher indicators of their health assessment. The older children have a higher self-confidence index, which may indicate the complication of the process of socialization of the studied group of older children. There was a strong connection between children's perception of their appearance and the level of self-esteem. There is a strong statistically significant difference between the research group and the control group according to the quality of life assessment scale. This may indicate that children with clefts are more cared for by adults and parents and they feel more protected, which allows them to maintain a high standard of living.

**Conclusions:** Was noted by us a strong relationship between the level of self-esteem and quality of life: the level of quality of life positively affects the child's self-esteem at all levels.

**KEY WORDS:** congenital non-unions, emotional state, quality of life, social adaptation, self-perception

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## INTRODUCTION

Congenital cleft upper lip and/or palate (CL/P) is the most common congenital craniofacial anomaly. In a review study conducted by Salari et al., in 2022 the prevalence of CL/P per 1000 live births was 0.45. CL/P are among the most severe malformations of the maxillofacial area, leading to significant functional (functions such as hearing, phonation, mastication, swallowing, and breathing) and aesthetic disturbances [1]. The prevalence of cleft palate varies significantly in European countries with a prevalence of 1/1000 among newborns in Europe. [2]. Thus, in recent years, in Ukraine we can observe increase frequency newborn children with CL/P [3]. Given into consideration the high prevalence of CL/P, it is needed preventive measures to reduce the number of patients, as well as diagnostic and treatment programs in order to reduce the effects of this disorder in children.

CL/P takes the second place in the structure of antenatal development shafts and is associated with a wide range of dental abnormalities [4]. A visible orofacial defect can affect oral health-related quality of life (OHRQoL). OHRQoL in this regard, it is relevant to study different aspects of the quality of life in patients of different age groups and with different types of CL/P, as well as the frequency and reasons for changes in HRQoL. However, the CL/P-specific health

concepts of individuals with CL/P measured to date have only been classified into the HRQoL conceptual framework under the following categories: physical, psychological, and social health, which focuses on examining physical functioning, and also on the psychological and social well-being of a person [5]. Aesthetic and functional disorders, as well as various dental anomalies that occur with CL/P both before and after restorative interventions, limit a person's communication, suppress his awareness of his own physical inferiority and lead to mental disorders, mainly depressive [5].

Children with CL/P are at increased risk of developing dental problems such as caries and gingivitis [6]. The teeth on the cleft side had a high level of gingivitis. Shallow gingival recessions often occurred around the central incisor on the cleft side [7]. Previous studies have reported a high prevalence of caries and bleeding gums because they are at high risk of poor oral hygiene compared to their non-CL/P peers [8]. Due to unfavorable changes in anatomical and morphological structures, patients with CL/P and alveolar cleft often accumulate dental plaque in the oral cavity [9]. In addition, most patients with CL/P undergo fixed orthodontic therapy, which limits oral hygiene, which increases the risk of dental and periodontal diseases [10].

Limited orofacial dysfunction may account for the impact on eating in children with CL/P, as suggested by A.L. Sundell and A. Marcusson (2019) [11]. Also, children with CL/P are prone to velopharyngeal dysfunction, which leads to speech problems [12]. The emotional component is closely related to psychological problems, which include self-esteem, appearance, and family support [13]. In addition, when analyzing the emotional aspect, children with CL/P report anxiety and fear, frequent conflicts in the family compared to their peers without CL/P [14].

Despite the comprehensive treatment that patients with CL/P receive, they still have lower OHRQoL, especially physical pain and psychological discomfort. At the same time, taking care of the condition of the oral cavity, which is a common practice, are motivational factors to maintain a long and complex regimen of oral care [15].

It is important to assess the quality of life among individuals who were born with congenital cleft lip and palate throughout their lives. Oral health has a significant impact on the HRQoL of this patient group. This may be because in addition to congenital cleft lip and palate, they also often have dental caries and bleeding gums. Inclusion of qualitative assessments of treatment efficacy and satisfaction with care among this patient cohort may be valuable. There is a need for individualized monitoring and prioritization of oral care, as HRQoL can be achieved with quality care. Implementation of standardized prevention and control programs aimed at education, motivation and responsibility will contribute to the improvement of oral health in children with congenital cleft lip and palate. Psychological support for cleft children and their families should be an integral part of care to reduce the stigma commonly associated with congenital cleft lip and palate.

## AIM

The aim of the study was to conduct a study of the quality of life in children with cleft lip and palate and concomitant diseases of the tissues of the oral cavity, to consider the issue of socialization and social adaptation of children with cleft lip and palate.

## MATERIALS AND METHODS

66 children with cleft lip and palate and concomitant diseases of the oral cavity tissues participated in the research, they were patients from the Department of Plastic and Reconstructive Microsurgery at National Specialized Children's Hospital "OKHMATDYT" (Kyiv, Ukraine) aged from 8 to 18 years old. Divided by gender: 42 - boys, 24 - girls. Patients were also divided by age into 2 groups: 8-11 years old - 26 people, 12-18 years old - 40 people. A comparison group was also formed, which included children with chronic somatic pathology in the number of 67 children aged from 12 to 18 years, who underwent treatment at the Okhmatdyt National Medical Center of the Ministry of Health of Ukraine. In this study was made a dental examination together with diagnostic study of children with cleft lip and palate, study of quality of life together with socialization and social adaptation. The

study of socialization and social adaptation of children and adolescents of the subjects was considered through the self-perception of the subjects in society, namely according to T. Dembo and S. Rubinstein self-worth assessment technique modified by A. Prikhozhan; assessment of emotional state according to the NADS method; assessment of O. Chaban Quality of Life Scale Method. Data were analyzed with the statistical package IBM SPSS Statistics Base (version 22) and EZR. All results were considered statistically significant at a value of  $p < 0.05$ . Quantitative data are presented as mean (M)  $\pm$  standard deviation (SD), unless otherwise stated. The normality of the data distribution was checked using the Shapiro-Wilk test.

## RESULTS

All patients in the research group had caries incidence with clinical changes in the periodontal tissues. During the dental examination, the triad was observed - adentia, overcompleteness of the dentition, retention of teeth is a negative effect on the functions of speech, chewing, swallowing, and breathing. The patients' parents and the patients themselves noted complaints of bad breath, accumulation of dental plaque, toothache, bleeding gums, and changes in the mucous membrane of the oral cavity.

Analysis of the results of self-assessment according to the method of T. Dembo and S. Rubinstein, which has such sub-scales as: health, abilities, character, self-confidence, relationship with peers, relationships in the family. Were obtained the following indicators: a direct correlation was observed between the age of the child and assessment of state of health, the older the children - the lower the health assessment index (children 8-11 years old - 8.18, older children 12-18 years old 7.42). A direct correlation between age and self-confidence was also noted, as example, children aged 8-11 had a higher self-confidence index - 8.38, than older children aged 12-18 - 7.28. (Table 1).

There is a statistically significant difference between age and self-esteem according to the Dembo-Rubinstein method, namely in the sub-scales: "Character" (strong), "Health" (weak), "Self-confidence" (moderate) "Beauty, appearance" (strong).

Also, age and general levels of self-esteem has a strong statistically significant difference according to the analysis: (in the age group 8-11 the average score is 84.54, in the age group 12-18 - 75.63). According to the sub-scale "Character" it is observed: in the age group of 8-11 years the average level of self-esteem is higher (average 8.08) than in the age group 12-18 (average 6.85). According to the sub-scale "Self-confidence" it is observed: in the age group of 8-11 years the average level of self-esteem is higher (average 8.38) than in the age group 12-18 (average 7.28). According to the sub-scale "Health" it is observed: in the age group of 8-11 years the average level of self-esteem is higher (average 8.18) than in the age group 12-18 (average 7.42). According to the sub-scale "Beauty, appearance" it is observed: in the age group of 8-11 years old the average level of self-esteem is higher (average 8.96) than in the age group 12-18 (average 7.15).

**Table 1.** Statistical analysis by age

Method	Age (mean)		Statistical probability (Welch ANOVA p)
	8-11	12-18	
Dembo-Rubinstein's self-assessment method:			
Character	8.08	6.85	0.008
Health	8.18	7.42	0.083
Self-confidence	8.38	7.28	0.031
Mind, ability	8.12	7.65	0.303
Beauty, appearance	8.96	7.15	0.001
Relationships in the family	9.00	8.38	0.131
Relationships with peers	8.62	8.30	0.461
The level of self-esteem	84.54	75.63	0.004
Chaban Quality of Life Scale	22.92	20.40	0.007
HADS A	5.50	5.75	0.759
HADS D	3.23	4.70	0.025

**Table 2.** Statistical analysis by gender

Method	Gender (mean)		Statistical probability (Welch ANOVA p)
	Male	Female	
Dembo-Rubinstein's self-assessment method:			
Character	7.36	7.29	0.904
Health	7.60	7.96	0.435
Self-confidence	7.67	7.79	0.837
Mind, ability	7.43	8.54	0.013
Beauty, appearance	7.55	8.42	0.132
Relationships in the family	8.31	9.17	0.041
Relationships with peers	8.33	8.58	0.602
The level of self-esteem	76.93	83.00	0.103
Chaban Quality of Life Scale	21.07	21.26	0.434
HADS A	5.44	5.96	0.660
HADS D	4.40	3.93	0.346

There is a strong statistically significant difference between age and quality of life assessment (Chaban Quality of Life Scale): in the age group of 8-11 years, the average level of self-esteem is higher (average 22.92) than in the age group 12-18 (average 20.40). Table 2.

There is a statistically significant difference between gender and self-esteem according to the Dembo-Rubinstein method, namely in the sub-scales: "Abilities" (moderate), "Relationships in the family" (moderate). (Table II) According to the "Abilities" sub-scale, it is observed as: the average level of self-esteem of the studied children and adolescent

boys is lower (average 7.43) than in girls (average 8.54). According to the sub-scale "Relationships in the family", the average level of self-esteem of the studied boys is lower (average 8.31) than in girls (average 9.17).

There is no statistically significant difference in the degree of severity and by age and gender. (Table 3. Table 4)

An analysis was conducted between the level of self-esteem and the quality of life of the comparison group of children. With a high statistical probability, there is a correlation between the level of quality of life (Chaban Quality of Life Scale) and the level of self-esteem according to the Dembo-

**Table 3.** Statistical analysis of the severity of anxiety/depression by age

Method	Age (%)		Statistical probability (chi-squared test)
	8-11	12-18	
HADS A			0.955
There are no reliable signs of anxiety	73.1%	70.0%	
Subclinical level of anxiety	23.1%	25.0%	
Clinical level of anxiety	3.8%	5.0%	
HADS D			0.284
There are no reliable signs of depression	96.2%	85.0%	
Subclinical level of depression	3.8%	7.5%	
Clinical level of depression	0.0%	7.5%	

*There is no statistically significant difference*

**Table 4.** Statistical analysis of the severity of anxiety/depression by gender

Method	Gender (%)		Statistical probability (chi-squared test)
	M	F	
HADS A			0.989
There are no reliable signs of anxiety	71.4%	70.8%	
Subclinical level of anxiety	23.8%	25.0%	
Clinical level of anxiety	4.8%	4.2%	
HADS D			0.840
There are no reliable signs of depression	90.5%	87.5%	
Subclinical level of depression	4.8%	8.3%	
Clinical level of depression	4.8%	4.2%	

Rubinstein method of self-esteem diagnosis subscales shown: "Character" (weak correlation); "Health" (moderate correlation); "Self-confidence" (moderate correlation); "Beauty, appearance" (moderate correlation); "Relationship with peers" (moderate correlation); "Level of self-esteem" (strong correlation) in the direction: better quality of life - better self-esteem. Therefore, it can be assumed that the level of quality of life has a positive effect on the child's self-esteem at all levels.

With a low statistical probability, there is a weak correlation between the level of quality of life (Chaban Quality of Life Scale) and the level of anxiety (HADS A) in the direction: a better level of quality of life - a lower level of anxiety. (Table 5). With a high statistical probability, there is moderate correlation between the level of quality of life (Chaban Quality of Life Scale) and the level of depression (HADS D) in the direction: better level of quality of life - lower level of depression. (Table 5).

Statistical analysis using the Spearman coefficient revealed: with a moderate statistical probability, there

is a weak correlation between the level of anxiety (HADS A) and the level of self-esteem according to the Dembo-Rubinstein method of self-esteem diagnosis according to the subscale: "Relationships with peers" (moderate correlation) in the direction: a higher level of anxiety - lower level of self-esteem.

With a high statistical probability, there is a correlation between the level of depression (HADS D) and the level of self-esteem according to the Dembo-Rubinstein method of self-esteem diagnosis according to the subscales: "Health" (weak correlation); "Self-confidence" (weak correlation); "Abilities" (moderate correlation); "Relationships in the family" (weak correlation); "Relationship with peers" (weak correlation); "Level of self-esteem" (moderate correlation) in the direction: a higher level of depression - a lower level of self-esteem.

With a moderate statistical probability, there is a correlation between the level of depression (HADS D) and the level of self-esteem according to the Dembo-Rubinstein self-esteem diagnostic method according to the subscale:



**Table 5.** Correlation of self-esteem according to the Dembo-Rubinstein scale with the level of anxiety, depression (HADS)

Method	HADS A		HADS D	
	Spearman coefficient $\rho$ (rho)	Statistical probability (p-value)	Spearman coefficient $\rho$ (rho)	Statistical probability (p-value)
Dembo-Rubinstein's self-assessment method:				
Character	-0.049	0.696	-0.287	0.020
Health	-0.175	0.160	-0.337	0.006
Self-confidence	-0.085	0.496	-0.363	0.003
Abilities	-0.124	0.322	-0.416	<0.001
Beauty, appearance	0.062	0.619	-0.198	0.111
Relationships in the family	-0.069	0.582	-0.370	0.002
Relationships with peers	-0.310	0.011	-0.371	0.002
The level of self-esteem	-0.156	0.212	-0.505	<0.001

**Table 6.** Comparison with the comparison group (full group)

Method	Group		Statistical probability (Welch ANOVA p)
	Research	Comparison	
Dembo-Rubinstein's self-assessment method:			
Character	7.33	7.50	0.586
Health	7.73	8.13	0.186
Self-confidence	7.71	7.67	0.822
Abilities	7.83	7.67	0.577
Beauty, appearance	7.86	7.53	0.378
Relationships in the family	8.62	8.18	0.162
Relationships with peers	8.42	7.95	0.134
Chaban Quality of Life Scale	21.39	18.90	<0.001
HADS A	5.65	6.00	0.573
HADS D	4.12	4.52	0.488

"Character" (weak correlation) in the direction: higher level of depression - lower level of self-esteem.

There is a strong statistically significant difference between the research and the comparison groups on the quality of life assessment scale: the research group have a higher average score (21.39) than the comparison group (18.92). (Table 6).

There is a strong statistically significant difference between the research group and the comparison group on the quality of life assessment scale. In the research group: 30.3% have a very high level of quality of life, 50.0% have a high level of quality of life, 18.2% have an average level of quality of life, and 1.5% have a low level of quality of life.

In the comparison group – 13.3% have a very high level of quality of life, 40.0% a high level of quality of life, 45.0% an average level of quality of life, 1.7% a low level of quality of life.

Therefore, it can be assumed that the research group has a higher level of quality of life (Table 7).

There is a moderate statistically significant difference between the research group and the comparison group (8-11 years old) on the subscale "Beauty, appearance": the research group has a higher average score (8.96) than the comparison group of patients (7.87)(Table 8).

There is also a strong statistically significant difference between the research group and the control group (8-11

**Table 7.** Assessments of the quality of life

Method	Group, %		Statistical probability (chi-squared test)
	Research	Control	
HADS A			0.456
There are no reliable signs of anxiety	71.2%	70.0%	
Subclinical level of anxiety	24.2%	20.0%	
Clinical level of anxiety	4.5%	10.0%	
HADS D			0.372
There are no reliable signs of depression	89.4%	81.7%	
Subclinical level of depression	6.1%	13.3%	
Clinical level of depression	4.5%	5.0%	
Chaban Quality of Life Scale			0.007
very high	30.3%	13.3%	
high	50.0%	40.0%	
medium	18.2%	45.0%	
low	1.5%	1.7%	

**Table 8.** Comparison with the comparison group (8-11 years):

Method	Group		Statistical probability (Welch ANOVA p)
	Research	Comparison	
Dembo-Rubinstein's self-assessment method:			
Character	8.08	7.78	0.472
Health	8.19	8.39	0.643
Self-confidence	8.38	7.83	0.234
Abilities	8.12	7.74	0.429
Beauty, appearance	8.96	7.87	0.016
Relationships in the family	9.00	8.83	0.657
Relationships with peers	8.62	7.91	0.125
Chaban Quality of Life Scale	22.92	18.83	<0.001
HADS A	5.50	5.74	0.798
HADS D	3.23	3.78	0.432

years old) on the scale "Assessment of the quality of life": the research group has a higher average score (22.92) than the control group (18.83). (Table 9).

There is a strong statistically significant difference between the research group and the control group (8-11 years old) according to the quality of life assessment scale: in the research group: 42.3% have a very high level of quality of life, 57.7% have a high level of quality of life. In the

control group - 8.7% have a very high level of quality of life, 43.5% have a high level of quality of life, and 47.8% have an average level of quality of life.

Therefore, it can be assumed that the research group (8-11 years old) has a higher level of quality of life.

There is no statistically significant difference on all scales between the research and the comparison groups (12-18 years). (Table 10, Table 11).



**Table 9.** Comparison with the control group, assessment of quality of life and emotional state

Method	Group, %		Statistical probability (chi-squared test)
	Research	Control	
HADS A			0.833
There are no reliable signs of anxiety	73.1%	65.2%	
Subclinical level of anxiety	23.1%	30.4%	
Clinical level of anxiety	3.8%	4.3%	
HADS D			0.480
There are no reliable signs of depression	96.2%	91.3%	
Subclinical level of depression	3.8%	8.7%	
Clinical level of depression	0.0%	0.0%	
Chaban Quality of Life Scale			<0.001
very high	42.3%	8.7%	
high	57.7%	43.5%	
medium	0.0%	47.8%	
low	0.0%	0.0%	

**Table 10.** Comparison with the control group (12-18 years old)

Method	Group		Statistical probability (Welch ANOVA p)
	Research	Control	
Dembo-Rubinstein's self-assessment method:			
Character	6.85	7.32	0.252
Health	7.42	7.97	0.190
Self-confidence	7.28	7.57	0.547
Abilities	7.65	7.62	0.941
Beauty, appearance	7.15	7.32	0.736
Relationships in the family	8.38	7.78	0.175
Relationships with peers	8.30	7.97	0.452
Chaban Quality of Life Scale	20.40	18.95	0.158
HADS A	5.75	6.16	0.619
HADS D	4.70	4.97	0.735

## DISCUSSION

M. Leopoldo-Rodado et al. (2021) assessed HRQoL in 4- to 7-year-old children treated with CL/P (n=171) compared to healthy controls (n=186). HRQoL in children was assessed using the Kiddy-KINDL and COHIP-14 questionnaires, and in parents - using the KINDL-p. Kiddy-KINDL total scores and parameter estimates showed similar values between children with CL/P and controls, except for the parameter "self-esteem." A comparison of the Kiddy-KINDL and KINDL-p showed a total score (82.11 vs. 80.44, respectively). The

CL/P group showed significantly worse values for the COHIP-14 total score (10.53 vs. 5.01, respectively) in all parameters [16].

D. Locker introduced the concept of OHRQoL in 1988. The OHRQoL questionnaire, OHIP-49, was developed to measure oral indicators that can affect people's daily activities [17]. Later was also presented a shorter version (OHIP-14) [18]. The OHIP-14 is a useful tool for assessing OHRQoL in various patient populations, including individuals born with CL/P. Thus, T. Kortelainen assessed general and oral

**Table 11.** Comparison of emotional state (HADS A/ HADS D)

Method	Group, %		Statistical probability (chi-squared test)
	Research	Control	
HADS A			0.240
There are no reliable signs of anxiety	70.0%	73.0%	
Subclinical level of anxiety	25.0%	13.5%	
Clinical level of anxiety	5.0%	13.5%	
HADS D			0.480
There are no reliable signs of depression	85.0%	75.7%	
Subclinical level of depression	7.5%	16.2%	
Clinical level of depression	7.5%	8.1%	
Chaban Quality of Life Scale			0.669
very high	22.5%	16.2%	
high	45%	37.8%	
medium	30%	43.2%	
low	2.5%	2.7%	

symptoms, functional limitations, emotional and social well-being were lower among patients with CL/P than among schoolchildren without CL/P (mean scores: 55.5 vs. 15.0; 11.9 vs. 5.1; 14.0 versus 2.8; 12.6 versus 2.9, respectively). That is, the authors found significantly lower OHRQoL among children with CL/P than among their peers without gaps in OHIP-14 scores [19].

OHRQoL in children and adolescents can be assessed using two different approaches: children can directly report their own perceptions or parents can assess their child's OHRQoL. At the same time, parents' perceptions of their children's OHRQoL are not accurate enough to detect problems with OHRQoL in an individual child aged 7 to 17 years, and therefore only such an OHRQoL assessment cannot be recommended for individuals in this age group [20]. For example, the assessment of the Child Perception Questionnaire 11-14 (CPQ(11-14)) and the Parent Perception Questionnaire (PPQ) of their child's oral health. Moreover, children's CPQ scores (11-14) are more strongly related to OHRQoL than their parents' PPQ scores, especially in the areas of social and emotional well-being [21]. Similarly, children with CL/P also have a greater impact on OHRQoL compared to children with other dental conditions [22].

Evidence confirms the feasibility of using the Early Childhood Oral Health Impact Scale (ECOHis) for preschool children, while age is a key factor among other recommended instruments for schoolchildren and adolescents. The Child-OIDP examines the frequency and severity of oral exposures experienced during the past 3 months using a 3-point scale [23]. According to S. Karki et al. (2021) children with both cleft lip and palate had lower OHRQoL than the rest. The same applies to patients who have a high level of dental

caries. The prevalence of caries ranged from 8 to 35% (n = 41) [24]. This is fully consistent with a systematic review reporting that eating, speech and emotional well-being are the most significant OHRQoL parameters among children and adolescents with CL/P [25].

## CONCLUSIONS

The patients' parents and the patients themselves of research group noted complaints of bad breath, accumulation of dental plaque, toothache, bleeding gums, and changes in the mucous membrane of the oral cavity. Children with cleft lip and palate at the younger age of 8-11 years had higher indicators of their health assessment. The older the children have the lower indicators of their health assessment (children 8-11 years old - 8.18, older children 12-18 7.42 years old.). Also, children aged 8-11 years had a higher self-confidence index - 8.38 than older children aged 12-18 years - 7.28, which may indicate the complication of the process of socialization of the studied group of older children. There was a strong connection between children's perception of their appearance and the level of self-esteem. The studied group did not have a high level of evaluation of their appearance, which also affected the level of self-esteem and the process of socialization.

There is a strong statistically significant difference between the research group and the control group according to the quality of life assessment scale. In the research group: 30.3% have a very high level of quality of life, 50.0% have a high level of quality of life, 18.2% - an average level of quality of life, 1.5% have a low level of quality of life. In the comparison group - 13.3% have a very high level of quality of life, 40.0% - a high level of quality of life, 45.0%

- an average level of quality of life, 1.7% - a low level of quality of life. This may indicate that children with clefts are more cared for by adults and parents and they feel more protected, which allows them to maintain a high standard of living. The parents of the children of the research group had a high parental potential, which had a positive effect on determining the high quality of life of the children.

Was noted by us a strong relationship between the level of self-esteem and quality of life: the level of quality of life positively affects the child's self-esteem at all levels: a better level of quality of life - better self-esteem. In addition, a high standard of living has a positive effect on the emotional state of children with a cleft: a better level of quality of life means a lower level of anxiety and depression.

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### CONFLICT OF INTEREST

The Authors declare no conflict of interest

### CORRESPONDING AUTHOR

**Tetiana O. Timokhina**

Bogomolets National Medical University

1 Zoologichna st., 03057 Kyiv, Ukraine

e-mail: tanyatimokhina@gmail.com

### ORCID AND CONTRIBUTIONSHIP

Tetiana O. Timokhina: 0000-0002-0220-0220 **A B C D F**

Olena V. Anoprienko: 0009-0009-8646-0940 **E F**

Anastasiia Y. Tokarchuk: 0009-0009-3086-2916 **C**

Kateryna L. Yurtschenko: 0009-0001-3623-6598 **C**

Bohdan M. Melnyk: 0000-0003-2232-8181 **A**

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**A** – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis, **D** – Writing the article, **E** – Critical review, **F** – Final approval of the article

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