



Screening for Emotional and Psychosocial Disorders in Children and Adolescents with Craniofacial Anomalies

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ABSTRACT:

Background: Children with abnormal facial appearance often face social prejudice. Numerous studies have demonstrated that these facial disfiguring conditions may lead to psychosocial and emotional problems, including high levels of social anxiety, social avoidance, and reduced quality of life.

Objective: To screen for emotional and psychosocial disorders in children and adolescents presenting craniofacial anomalies.

Method: The Pediatric Symptom Checklist (PSC) was filled up by both sexes children and adolescents undergoing follow-up at a specialized craniofacial anomalies treatment center in Cascavel City, Paraná, Brazil. In this study, a cutoff score of ≥ 28 points was adopted, a situation considered positive, identifying individuals at risk for mental disorders and indicating the need for referral to mental health care professional. Furthermore, the variables body mass index (BMI) and age also were analyzed.

Result: 52 questionnaires were filled up, five (9.6%) were discarded by incomplete data, 47 (90.3%) were analyzed. The sample comprised 25 (53.2%) male and 22 (46.8%) female, aged from 6 to 16 years (mean: 9.8 years old). According to body mass index (BMI) classification, 32 (68%) participants were of normal weight, 12 (25.5%) were underweight, one (2.12%) was overweight, and two (4.2%) were classified as obese. There was association between BMI and trend to mental disorders ($p = 0.007$). In contrast, no relationship was observed with age ($p = 0.055$) and sex ($p = 0.173$) among children and adolescents with craniofacial anomalies.

Conclusion: Children with overweight or obesity exhibit a higher likelihood of mental disorders when presenting with craniofacial anomalies.

Key-words: child, adolescent, questionnaire, craniofacial anomalies, cleft lip-palate, mental disorders.

I. INTRODUCTION

Research indicates that mental disorders in childhood, in addition to compromising overall functioning, tend to follow a persistent course and often remain undiagnosed and inadequately treated. Such conditions are associated with adverse life outcomes, including substance use, involvement in criminal activities, unemployment, premature mortality, difficulties in parenting, and an increased risk of mental disorders in adulthood¹. Recent studies further indicate that children and adolescents with chronic illnesses face additional challenges, such as exposure to social discrimination and, consequently, greater vulnerability to the development of emotional disorders, with craniofacial malformations standing out among these conditions, as they are frequently associated with difficulties in social adaptation and emotional, and behavioral manifestations². Therefore, identifying the prevalence of mental disorders in childhood, as well as vulnerability and protective factors, is essential to guide health policies, optimize resource allocation, and improve prevention and treatment strategies¹. Evidence from the literature indicates that such conditions may result in multiple psychosocial impairments, including high levels of anxiety, social avoidance behaviors, and a consequent reduction in quality of life³.



Craniofacial anomalies, including cleft lip and cleft palate, constitute relatively common congenital malformations characterized by osseous and soft tissue defects of the face, which may compromise multiple facial functions⁴.

Among the various validated instruments for screening of emotional and behavioral disorders in children and adolescents are the Pediatric Symptom Checklist (PSC), the Strengths and Difficulties Questionnaire (SDQ), and the Adverse Childhood Experiences-Questionnaire (ACE-Q), among others. Although these tools are not diagnostic, they allow for the identification of potential cases of mental disorders in this population⁵.

The objective of this study was to conduct a screening for emotional and psychosocial disorders in children and adolescents with craniofacial malformations.

II. METHOD

This was a cross-sectional, descriptive, and observational study carried out at the Center for Care and Research in Craniofacial Anomalies of a university hospital in the municipality of Cascavel, PR, Brazil, conducted from June 2024 to December 2025. After signing Informed Consent Form was obtained from parents or legal guardians for participants under 12 years of age, and written Informed Assent Form was also obtained from those older than this age, the Pediatric Symptom Checklist (PSC) was filled up by all voluntary participants diagnosed with craniofacial malformations according to the International Classification of Diseases (ICD-11): cleft lip, cleft palate, cleft lip and palate, as well as other congenital malformations of the skull and face. In addition to the PSC score, the following variables were analyzed: age, sex, and body mass index (BMI).

For BMI calculation, body weight was measured with the participant wearing light clothing, using a weight electronic scale (Líder® model P-300C, series 31403, year of manufacture: 2014, Brazil), and height was measured with the subject barefoot using a wall-mounted stadiometer (Balmak®, model EST-223, year of manufacture: 2020, Brazil). BMI was calculated using the Quetelet index (weight in kilograms divided by height in meters squared – kg/m²). The interpretation of values followed the criteria proposed by the World Health Organization (WHO) Child Growth Standards (2006), using age- and sex-specific growth charts. BMI was classified according to the Z-score as follows: severe thinness ($Z < -3$), thinness ($Z \geq -3$ and < -2), normal

weight ($Z \geq -2$ and $\leq +1$), overweight ($Z > +1$ and $\leq +2$), obesity ($Z > +2$ and $\leq +3$), and severe obesity ($Z > +3$).

For the assessment of emotional and psychosocial symptoms, the Brazilian version of the Pediatric Symptom Checklist (PSC) was used⁶. The instrument was completed by legal guardians for participants younger than 12 years of age and by the adolescents themselves for those aged 12 years or older. The PSC consists of a 35-item questionnaire designed to assess, based on the perception of parents or caregivers or the adolescent when cognitively able, behavioral and emotional development aspects of children and adolescents. Responses are recorded on a frequency scale, with the options “never” (0 points), “sometimes” (1 point), and “often” (2 points). It is a screening tool, not intended for diagnostic purposes, that assists in identifying signs suggestive of possible emotional and psychosocial disorders, including attention difficulties, symptoms of anxiety and depression, impulsivity, aggressiveness, and hyperactivity. In this study, a cutoff score of ≥ 28 was adopted, above which the participant was considered eligible for evaluation by a mental health professional.

Statistical analysis was performed using Stata/SE software, version 14.1 (StataCorp LP, USA, 2020). For age description, the mean, median, minimum, and maximum values, as well as the standard deviation, were calculated. Frequencies and percentages were used to summarize qualitative variables. For comparison between the PSC classification groups, normal (negative) and abnormal (positive), in relation to age, the independent samples Student's t test was used. To assess the association between sex, BMI, and the presence of cleft lip, cleft palate, or both with PSC scores, the chi-square test was used. To evaluate the joint association of these variables with the PSC assessment outcome, a logistic regression model was fitted. The p-values less than 0.05 were considered indicative of statistical significance.

Participants who presented an incomplete questionnaire, absence of a confirmed diagnosis, noncompliance with the age range defined in the protocol, or cognitive impairment that precluded completion of the instrument were excluded from the study.

This research was approved by the Institutional Review Board of the State University of Western Paraná, Cascavel campus, PR, under approval number 6.860.551/2024.



III. RESULT

A total of 52 questionnaires were administered, of which five (9.6%) were excluded for meeting one or more of the exclusion criteria; therefore, the final sample consisted of 47 participants.

Regarding the age of the participants, it ranged from 6 to 16 years, and increasing age was associated with a higher likelihood of a positive PSC result. Concerning sex differences, the majority of positive cases were male, and in relation to body mass index (BMI), a trend toward

an increase in positive cases was observed as BMI increased. In the analysis of craniofacial malformations, the most common conditions were cleft lip and palate and their variants. The remaining conditions (such as Möebius syndrome, facial asymmetries and facial paralysis, hypertelorism, velocardiofacial syndrome, microtia, and auditory canal atresia) comprised the remainder of the participants. Table 1 shows the relationship between the studied variables and PSC scores.

Table 1. Relationship between PSC score and age, gender and BMI.

Age					
PSC*	n	Mean	S-D**	p value	
Negative	34	8.8	3.1		
Positive	13	10.8	3.2	0.055	
Gender					
PSC	Female		Male		p value
	n	%	n	%	
Negative	18	81.8%	16	64.0%	0.173
Positive	4	18.2%	9	36.0%	
Total	22	100.0%	25	100.0%	
BMI					
PSC	Normal		Overweight		p value
	n	%	n	%	
Negative	27	84.4%	7	46.7%	0.007
Positive	5	15.6%	8	53.3%	
Total	32	100.0%	15	100.0%	
Craniofacial anomaly					
PSC	Cleftlipandpalate		Others		p value
	n	%	n	%	
Negative	23	69.7%	11	78.6%	0.534
Positive	10	30.3%	3	21.4%	
Total	33	100.0%	14	100.0%	

*PSC: Pediatric Symptom Checklist; **S-D: Standard Deviation.

IV. DISCUSSION

Since the first results of the Global Burden of Disease Study (GBD), published in the 1990s, consistent evidence has shown that mental disorders rank among the leading causes of the global burden of disease and that their onset occurs predominantly in childhood and adolescence, with a peak around 14 years of age. Considering their high chronicity and association with adverse life outcomes, the recognition and early identification

of these disorders through systematic screening strategies are essential to reduce individual, social, and economic impacts⁷.

Although no statistically significant association was found in this study between age distribution and the tendency toward mental disorders, the mean age of participants with a positive PSC result was lower than that described in the literature. Population-based studies indicate that the prevalence of mental disorders tends to



increase throughout adolescence, with higher rates observed in older age groups⁸. The difference observed in this study may be related to the specific characteristics of the sample, composed of children and adolescents with craniofacial malformations, a condition that may anticipate the onset of emotional and psychosocial difficulties due to early exposure to stigmatization, prolonged treatments, and repeated healthcare procedures⁹.

In this study, no association was observed between sex and the tendency toward the development of psychopathologies; however, studies demonstrate that female adolescents exhibit higher levels of concern and body image disturbances, as well as lower satisfaction with facial appearance, when compared with male adolescents. Furthermore, due to sociocultural pressures related to beauty standards, young individuals with craniofacial deformities are more vulnerable to social stigmatization and body image disturbances, particularly among females^{3,9}.

Evidence from the literature demonstrates that excess weight in children and adolescents is associated with impairments in mental health, with an impact on emotional well-being and behavior. It is also noteworthy that the presence of chronic conditions, such as obesity, is associated with a higher prevalence of mental disorders. In agreement with these findings, the present study identified an association between excess weight and a tendency toward an increased prevalence of positive PSC results as BMI increased^{10,11,12}.

Regarding the craniofacial malformations analyzed, the group with cleft lip and palate presented the highest PSC scores; however, no significant association was observed. Additionally, this was the most frequently identified craniofacial anomaly in the analyzed group. Results from different studies indicate that cleft lip and palate is associated with an increased occurrence of psychosocial problems, including externalizing manifestations, such as conduct disorder, and internalizing manifestations, such as depressive and anxious symptoms, low self-esteem, as well as a decline in quality of life^{13,14}. Added to this is the recurrent exposure to social stressors, such as public curiosity and differential treatment in social interactions. Moreover, children with craniofacial anomalies frequently exhibit concern about their appearance, as well as social anxiety, as they are often stereotyped as less capable and less attractive, thereby affecting their quality of life^{3,13}.

This study presented some limitations, among which the reduced sample size, the specificity of the evaluated population (composed of patients with craniofacial anomalies), the

screening nature of the PSC rather than a diagnostic instrument, and the single-center design stand out. These aspects may restrict both the generalizability of the findings and the statistical power of the analyses, thereby limiting the identification of significant associations.

V. CONCLUSION

In this study, individuals with craniofacial malformations and excess weight presented a higher risk of emotional and psychosocial disorders, highlighting the importance of a comprehensive and multidisciplinary approach for these cases. In this context, future studies with larger samples are necessary to confirm the relationship between overweight and mental disorders, especially in populations with craniofacial malformations, and to support the improvement of care strategies. Therefore, pediatricians should be attentive to the emotional and psychosocial adjustment difficulties of the child and their family, performing regular screening of cognitive and psychological development, as well as academic performance. The identification of these vulnerabilities enables timely early interventions and appropriate referrals, aiming to minimize future impacts.

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