

# Screening for Communication Delay among children between 6-24 months with Cleft Lip and Cleft Palate using Infant Toddler Checklist

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## Abstract

**INTRODUCTION:** One of the most common congenital craniofacial defects in children is cleft lip and palate. Numerous challenges, including early feeding difficulties, nutritional problems, aberrant speech development, dental abnormalities, and hearing loss, are frequently present in them. Studies have revealed that kids with cleft lip and palate have delayed expressive language, which is demonstrated by their slower rate of sound and word acquisition with limited vocabulary.

**METHODOLOGY:** A cross sectional survey was carried on 50 children with cleft deformity. Using google forms, a survey questionnaire was prepared using the Infant Toddler Checklist (ITC) assessing the communication skills of the children. Additional information was gathered about the family structure, number of languages, nuclear/joint family and the use of mobile phones. General physical examination and a growth evaluation were done.

**RESULTS:** Among 50 children in the study, 30 children had normal total score corresponding to the age of the child whereas 20 children (40%) had low scores for the age of the child. 32% of children had a concern communication composite score, 30% of children had a concern expressive speech composite score whereas 38% of children had a concern symbolic composite score.

**CONCLUSION:** Communication and language deficits are present in children with orofacial clefts. A comprehensive screening tool for communication delays in children between the ages of 6 and 24 months is called the ITC. Children who score positively on the screen or who have concerns on the ITC require additional testing for communication difficulties as well as an autism-specific screen.

**Keywords:** Orofacial clefts; Communication delay; Language delay; Mobile devices.

## INTRODUCTION

Cleft lip and cleft palate are one of common congenital craniofacial anomalies in children. Babies are born with isolated cleft lip, isolated cleft palate, or with both cleft lip and cleft palate. These defects arise in about 1·7/1000 live born babies, with ethnic and geographic variations (1).

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The etiology of craniofacial anomalies is thought to be multi-factorial, with both genetic and environmental factors playing an equally important role. Children with cleft lip and palate often demonstrate multiple problems such as early feeding difficulties, nutritional issues, developmental delays, abnormal speech development, dental, and orthodontic abnormalities, and hearing loss (2). Several reports have shown that children with cleft lip and palate have delayed expressive language, evidenced by the slower acquisition of sounds and words and a restricted number of sounds in early infancy (3,4). Communication delay is one of the serious issues faced by children with craniofacial abnormalities, which can affect their behavioral development, social interactions, and general quality of life. Communication and language disorders are also related to problems in adulthood, such as difficulties in peer relationships, low academic achievement and poor mental health. Hence, early screening of communication delays and provision of proper multidisciplinary care for these children along with the counseling of their parents is essential.

The Infant Toddler Checklist (ITC) was developed for early identification of children between 6–24 months, who are at risk of developing communication impairment. Scoring provides recommendations for monitoring and referral for early identification and early intervention. The Infant Toddler checklist is also used for the detection of a range of developmental concerns; including language delay, global developmental delay, and autism spectrum disorder (ASD) (5). In this study, we aim to assess communication skills among children with cleft lip and palate between 6-24 months and to assess the socio-demographic features among the families.

**METHODOLOGY**

Type of study- Prospective cohort study

Study participants- Children admitted with cleft lip and/or cleft palate in the Smile train project

Total number of participants- 50 children

Period of study – March 2022 to October 2022

Research tool-Infant Toddler Checklist

After getting IRB approval from the institutional ethics committee all children of age 6 months to 24 months admitted with cleft lip and palate were included in the study. Their detailed history including development history, demographic pattern, family history, and socioeconomic details was obtained. Additional history regarding type of family whether nuclear or joint family, number of languages spoken at home, and use of mobile and other devices among the children was obtained. A general physical examination and growth assessment was performed. The Infant-Toddler Checklist questionnaire containing 24 items was administered to the mother or caregiver. The Infant-Toddler Checklist has 7 language predictors with 24 items pertaining to emotion and eye gaze, use of communication, use of gestures, use of sounds, use of words, understanding of words, and use of objects. The language predictors are indicators of later language development. Correlation between the communication with socio-demographic and statistical analysis was done. The 24 questions range from 2 to 4 points within each of the 7 clusters and a score of 0 is given if the item is not checked, 1 point for an item checked sometimes and points for items checked often. A total score of 57 is divided among the communication composite with 26 points, the expressive speech composite has 14 points and the symbolic composite has 17 possible points.

Statistical analysis was calculated using SPSS software. Frequencies and percentages were calculated for qualitative data.

**RESULTS**

The study participants included 50 children between 6-24 months with craniofacial anomalies cleft lip and/or cleft palate.

Table 1 Frequencies and percentages of Socio demographic factors

Variables		Frequency	Percent
Sex	Female	28	56.0
	Male	22	44.0
Father's education	Graduate	14	28.0
	High school certificate	29	58.0
	Illiterate	1	2.0
	Intermediate or diploma	5	10.0
	Profession or Honours	1	2.0
Father's occupation	Clerks	5	10.0
	Craft & Related Trade Workers	6	12.0
	Elementary Occupation	4	8.0

	Plant & Machine Operators and Assemblers	1	2.0
	Professionals	6	12.0
	Skilled Agricultural & Fishery Workers	21	42.0
	Technicians and Associate Professionals	7	14.0
Mother's education	Graduate	11	22.0
	High school certificate	32	64.0
	Intermediate or diploma	7	14.0
Mother's occupation	Clerks	2	4.0
	Elementary Occupation	1	2.0
	Legislators, Senior Officials & Managers	1	2.0
	Professionals	4	8.0
	Skilled Agricultural & Fishery Workers	12	24.0
	Technicians and Associate Professionals	4	8.0
	Unemployed	26	52.0
Total monthly income of the family	>Rs.1,26,360	5	10.0
	≤Rs.6323	3	6.0
	Rs.16327 - Rs.18949	16	32.0
	Rs.18,953 - Rs.31,589	11	22.0
	Rs.31,591 - Rs.47,262	7	14.0
	Rs.47,266 - Rs.63,178	2	4.0
	Rs.63,182 - Rs.1,26,356	5	12.0
Defect in cleft lip or cleft palate	Both	17	34.0
	Cleft lip	14	28.0
	Cleft palate	19	38.0
Type of family	Joint family	10	20.0
	Nuclear family	34	68.0
	Third generation family	6	12.0
Total number of family members	>5	12	24.0
	2	1	2.0
	3	21	42.0
	4	16	32.0
Number of languages spoken	1.0	36	72.0
	2.0	14	28.0
Dysmorphism/ Syndromic presentation	dysmorphic features	0	0
	no dysmorphism	50	100

Table 1 shows the frequencies and percentages of demographic factors and other variables.

Among 50 participants in the study, 56% were girls and 44% were boys. The percentage of children with cleft lip and cleft palate was 34% while 28% had isolated cleft lip and 38% had an isolated cleft palate. 28% of fathers in the study were graduates, 58% studied up to high school, 2% were illiterate, and 10% of fathers studied till their diploma. Father’s occupation revealed that 10% of them were clerks,

12% were craft and related trade workers, and 2% were plant and machine operators and assemblers. 12% were professionals, 42% were skilled, and 14% were technicians. 11% of mothers were educated till graduate level, 64% had high school education, 14% were intermediate or diploma while 52% of mothers were unemployed. 68% of children belonged to nuclear families and in 72% households, single language was spoken as seen in table no. 1.

Table 2 Distribution of usage of devices

Variables		Frequency	Percent
Does the child use any devices	No	28	56.0
	Yes	22	44.0
If yes how many hours each week	1-3 hours	13	26.0
	3-6 hours	7	14.0
	6-9 hours	2	4.0
	No	28	56.0
Does the child watch television	No	18	36.0
	Yes	32	64.0
If yes how many hours per day	1-3 hours	19	38.0
	3-6 hours	11	22.0
	6-9 hours	1	2.0
	more than 9 hours	1	2.0
	No	18	36.0

Among 50 children 44% used the devices. It was seen that 26% used devices for 1-3 hours, 14% used 3-6 hours, and 4% used 6-9 hours. 64% of children watch television. 36%

watch 1-3 hours, 22% watch 3-6 hours, 2% watch 6-9 hours, and 2% watch more than 9 hours as seen in table no. 2.

Table 3 Infant Toddler checklist scores

INFANT TODDLER CHECKLIST	Children with normal score	Children with concern score
Total no. of children (n=50)	30 (60%)	20 (40%)
Communication Composite: Emotion and use of eye gaze Use of communication Use of gestures	34 (68%)	16 (32%)
Expressive speech composite: Use of sounds Use of words	35 (70%)	15(30%)
Symbolic composite: Understanding of words Use of objects	31 (62%)	19(38%)

Among 50 children in the study, 30 children had normal total score corresponding to the age of the child whereas 20 children (40%) had low scores for the age of the child. 68% of children had a normal communication composite score, 70% of children had a normal expressive speech composite score whereas 62% of children had a normal symbolic

composite score as seen in table no 3.

**DISCUSSION:**

Optimal management of children with orofacial cleft disorders requires dedicated and coordinated effort by a

team of specialists from multiple disciplines for an excellent outcome. Children with orofacial clefts usually have multiple co-morbidities such as feeding issues leading to nutritional deficiencies, developmental delay, speech impairment, and recurrent respiratory infections which affect the outcome.

According to a study published, the overall incidence of distribution of cleft lip is 15%, cleft palate is 40% whereas both cleft lip and palate occur in 45% of affected children. (6) In the present study it was observed that 28% of children had an isolated cleft lip, 38% had an isolated cleft palate whereas 34% had a cleft lip and palate. Syndromic or non-syndromic occurrence may be associated with cleft lip and palate. Over 300 syndromes are known to be associated with orofacial clefts like Treacher-Collins syndrome and Waardenburg syndrome. (6) None of the children in our study had features of a syndromic presentation.

According to earlier reports, children with cleft lip and palate exhibit early language delay which is both receptive and expressive in nature. Children with cleft palate experience the abnormal nasal resonance of sound, atypical consonant production, and articulation defects. In a study from South India on communication delay in children with cleft lip and palate, it was observed that 43% of the 129 study participants had abnormalities in articulation and resonance, 12% had articulation deviations, 3% had abnormalities in resonance and 3% had delayed language development. (7)

According to a study published in Sweden children with non-syndromic cleft lip and palate have a higher risk of language disorders, intellectual disability as well as neurodevelopmental issues like increased risk of autistic spectrum disorder (8). In another study conducted on 893 children with a mean age of 18.7 months, 22.4 % of parents reported mobile media device use which was about 15.7 minutes every day. The results from this study revealed that use of smartphone usage was significantly associated with expressive speech delay in children. (9) Following the Covid-19 pandemic there is increased usage of mobile devices among children of all ages.

In the present study, the Infant Toddler checklist was selected to screen the children with oro-facial clefts for communication delay among children between 6 to 24 months. The self-administered questionnaire was filled out by the parent of the child and the total score was calculated. This simple checklist can be filled out within 5 to 10 minutes. The checklist is designed to identify different aspects of development in infants and toddlers. Since many behaviors that develop before a baby learns to talk may indicate language delay, this checklist was administered to parent of the child between 6 to 24 months age. Some of the items on checklist identify gestures like "Does your child nod his/her head to indicate yes?" and other items check understanding "When you call your child's name, does he/she respond by looking or turning towards you?" As a communication screener, the ITC identifies children with

any type of communication delays, including ASD. In the present study it was seen that 60% of children had normal total scores while 40% children had total scores which were below cutoff score and were concerning. In a Swedish study conducted on 679 children between ages of 16-20 months, children were screened for communication difficulties by using ITC. (10) Children who had a positive screen with score of concern were referred for detailed assessment.

In a study by Wetherby et al. (2004), 3021 children from a general population sample were screened with the ITC between 6 and 24 months and children performing in the bottom 10th percentile on the ITC were invited for a communication evaluation using the CSBS DP Behavior Sample during the second year of life. Their results suggest that the ITC has high sensitivity and specificity (both 88.9%) for catching toddlers at risk for ASD and other developmental delays. (11)

In the present study Communication Composite score was below the cutoff score and was of concern in 32% children, expressive speech composite score below cutoff score was in 30% subjects whereas symbolic composite score below cutoff score in 38% study participants. A child should be referred for an evaluation if the Communication Composite, Symbolic composite or Total Score are in the concern range. A child should be monitored closely if Expressive Speech Composite is in the concern range and should be referred for an evaluation if in the concern range on second checklist completed 3 months later.

There are several other variables that affect language and communication delay. 68% children were from nuclear family and only 20% lived in a joint family. 585 of fathers had high school certificate while 64% mothers had high school education. It was observed that 72% children were from family where a single language was spoken. Regarding use of smart-phone and media, 44% children used to devices, while 31% children watched television. It was noted that 38% children watched television for 1-3 hours daily while 26% children used mobile devices for 1-3 hours per week. The recent policy statement by the American Academy of Pediatrics "Media and Young Minds" recommended to discourage screen media in children younger than 18 months (except video chatting) and in children aged between 18 to 24 months use of solo media to be avoided.

Children who have scores in concern range in ITC on any Composite score or the Total score may have specific language impairment, hearing impairment, more general development delays, autism spectrum disorder, or with further development may only have speech impairments or may catch up.

## CONCLUSION:

Orofacial clefts in children are associated with many morbidities including communication and language delays. The Infant Toddler Checklist is a broadband screen for

communication delay among children between 6 to 24 months. Children with a positive screen or concerns on the ITC need further evaluation for communication impairments as well as Autism -specific screen.

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