International Journal of Dental Sciences
www.dentaljournal.in
E-ISSN: 2663-4708, P-ISSN: 2663-4694
Received: 03-07-2025; Accepted: 03-08-2025; Published: 18-08-2025
Volume 7, Issue 3, 2025, Page No. 48-51

Gynecologists' and pediatricians' awareness of nasoalveolar molding in newborns with cleft lip and palate

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Abstract

Objective: This study aimed to assess the knowledge and awareness levels of gynecologists and pediatricians in Gujarat, India, regarding nasoalveolar molding (NAM), a presurgical orthopedic intervention for newborns with cleft lip and/or palate (CLP).

Materials and Methods: A structured online questionnaire comprising 12 items was distributed to randomly selected gynecologists and pediatricians across Gujarat. The survey collected demographic data, clinical exposure to CLP, and specific knowledge about NAM. Descriptive and comparative statistics were used for analysis.

Results: Out of 104 respondents, 44.2% were pediatricians and 55.8% were gynecologists. Only 47.1% had heard of NAM or feeding plates, and just 30.1% knew its purpose. Merely 19.4% of the participants referred CLP patients for NAM therapy. The majority referred cases to plastic surgeons, while only 4.8% referred to pediatric dentists. Awareness was slightly higher among pediatricians, but the overall knowledge level remained low across both specialties.

Conclusion: Despite their critical roles in early detection and management, both pediatricians and gynecologists displayed inadequate awareness regarding NAM. Improved interprofessional education and integrated referral systems are essential for timely and effective CLP intervention.

Keywords: cleft lip and palate, nasoalveolar molding, pediatricians, gynecologists, awareness

Introduction

Non-syndromic cleft lip and/or palate (CL/P) represents one of the most frequent congenital craniofacial anomalies globally, with its etiology involving a complex interplay of genetic and environmental influences [1]. While CL/P can occur in isolation, over 275 syndromes have been identified that include orofacial clefts as a key feature, often stemming from genetic mutations, chromosomal abnormalities, or teratogenic exposures [2]. Facial development takes place between the 4th and 12th weeks of gestation, and failure of proper fusion during this critical period results in craniofacial clefts [3, 4].

Effective management of CL/P requires coordinated, multidisciplinary care involving pediatricians, obstetricians, surgeons, orthodontists, and other specialists. Nutrition poses an early challenge, often managed using feeding plates. Modifications to these appliances can approximate cleft segments and support nasal structure, enhancing facial outcomes [3]. Treatment commonly includes pre-surgical orthopedics, lip and palate repair, and management of associated anomalies [5, 7].

Nasoalveolar molding (NAM), introduced by Matsuo *et al* [8]. and refined by Grayson and Maull [9], leverages neonatal cartilage plasticity for improved outcomes [7]. Pediatricians play a critical role in early diagnosis and referral, as they are often the first to examine affected newborns [10]. This study assesses pediatricians' awareness of NAM and its application in CL/P care.

However, studies from Turkey and other nations suggest that awareness of NAM among non-dental clinicians is limited. Despite India's high CLP burden, no prior study had comprehensively evaluated NAM-related awareness among gynecologists and pediatricians in the country. This study fills that gap by assessing the knowledge levels of these professionals in Gujarat, India.

Materials and Methods

Study Design and Population

This cross-sectional survey was conducted across Gujarat, India. A total of 104 gynecologists and pediatricians participated voluntarily. The questionnaire was developed using Google Forms and contained 12 closed-ended questions based on prior validated formats. It covered demographic details, clinical exposure, and knowledge of NAM. Participants were recruited via email and WhatsApp networks of medical associations. Data were analyzed using descriptive statistics (percentages, frequencies) using MS Excel. Chi-square tests were used for comparison between groups.

Results

In the present study, a total of 104 participants actively responded to the survey with no dropouts observed. Among the 104 respondents, 62 were females (59.6%) and 42 were males (40.4%).

Table 1: Designation distribution of participants in the current survey

Designation	No. of Participants (%)
Gynecologists	58 (55.8%)
Pediatricians	46 (44.2%)

Regarding the professional designation, 58 (55.8%) participants were gynecologists, while 46 (44.2%) were pediatricians (Table 1). The majority of the participants (82.7%) reported working in government hospital setups, whereas only 17.3% were associated with private practice (Figure1). The experience levels of respondents ranged from 2 to over 18 years in their respective specialties.

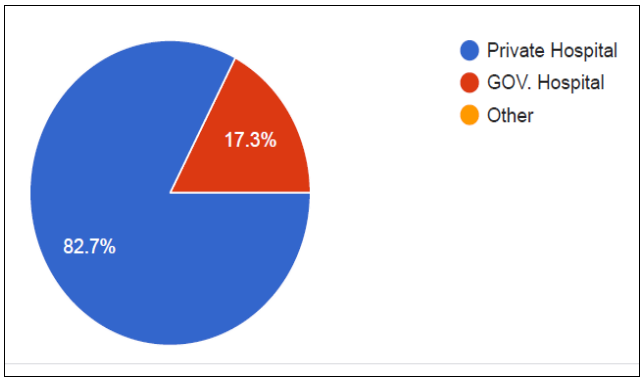

Fig 1: When participants were asked whether they had encountered newborns with cleft lip and palate (CLP) during their clinical practice, 21.2% reported they had never seen such cases, while 52.9% stated they had attended to 5–10 or more CLP newborns (Figure 2).

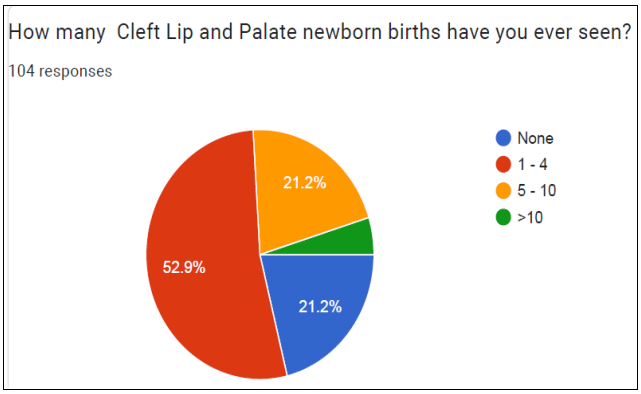

Fig 2: When inquired about prior awareness of orthopedic applications such as nasoalveolar molding (NAM) used in presurgical treatment of CLP, 47.1% of participants responded affirmatively, whereas 52.9% had never heard of it (Figure 3).

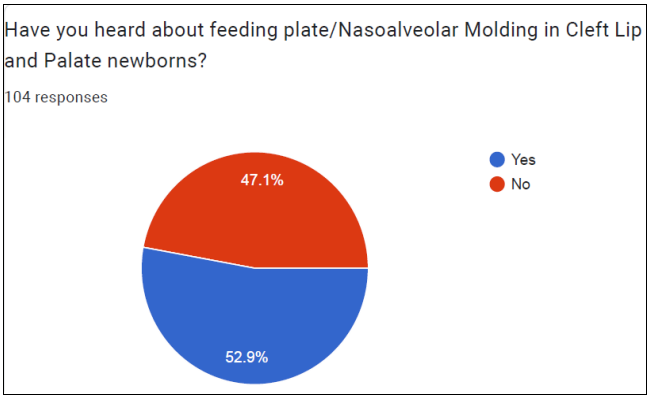

Fig 3: Regarding the knowledge of the purpose of NAM, only 52.9% of participants correctly understood its indication in cleft treatment, and the remaining 47.1% either did not know or misunderstood its function (Figure 4).

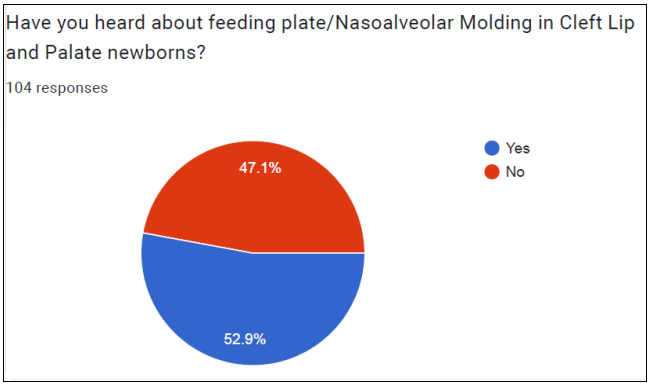

Fig 4: On being asked about their knowledge of who performs NAM, 77.9% were unaware of the responsible healthcare specialist (Figure 5).

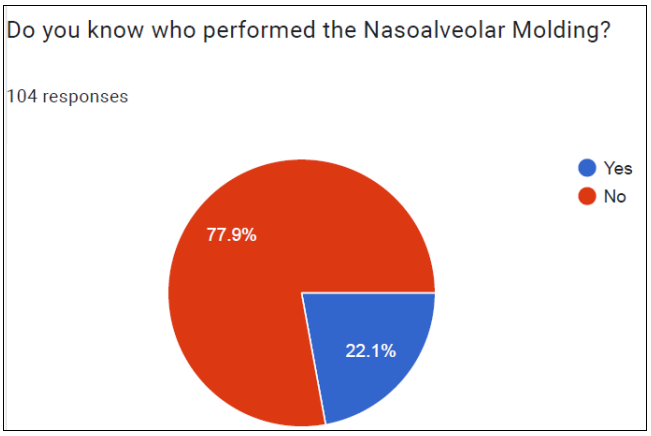

Fig 5: When asked about referral behavior, only 19.2% of participants reported referring CLP newborns for NAM therapy. Most participants (45.2%) indicated that they referred such cases to plastic surgeons, while only 19.2% referred to pediatric dentists (Figure 6).

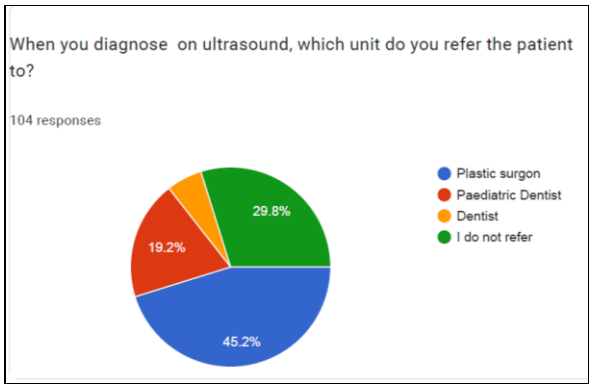

Fig 7

Discussion

Cleft lip and/or palate (CL/P) is one of the most common congenital craniofacial anomalies, affecting approximately 1 in every 700 live births worldwide [11, 12]. Effective management of CL/P requires a multidisciplinary approach involving pediatricians, gynecologists, plastic surgeons, orthodontists, and pediatric dentists. Among these, pediatricians and gynecologists play a pivotal role in early diagnosis, parental guidance, and timely referral especially in the newborn period, when interventions like nasoalveolar molding (NAM) are most effective [13].

NAM is a pre-surgical orthopedic appliance developed to align the alveolar and nasal segments before surgical repair. Introduced by Grayson and Maull [9], and based on earlier work by McNeil [14], NAM utilizes the plasticity of neonatal cartilage, which is enhanced by maternal estrogen levels during the early postnatal period [15]. Clinical benefits of NAM include narrowing of the cleft, improved nasal symmetry, minimized surgical scarring, and in many cases, reduced need for future surgical revisions [16].

Our study assessed awareness of NAM among 104 medical professionals, of which 44.2% were pediatricians and 55.8% gynecologists. Most participants (82.7%) worked in government hospitals. While a significant portion (52.9%) had encountered more than 10 CL/P births in their practice, only 46.2% reported awareness of pre-surgical orthopedic interventions. Specifically, just 47.1% had heard of NAM, and only 24% understood its purpose. Furthermore, only 22.1% could correctly identify the specialist responsible for NAM therapy, reflecting a clear gap in professional knowledge.

Even more concerning is the fact that 73.8% of participants had never referred a single case for NAM within a year, and only 38.8% reported ever referring a patient for this procedure. Referral preferences further highlight the disconnect, with most directing CL/P cases to plastic surgeons (45.2%), followed by pediatric dentists (29.8%) and general dentists (19.2%). A small percentage (5.8%) did not refer at all, despite early referral being essential for successful NAM application and optimal surgical outcomes.

Previous literature supports these findings. A study by Adebola *et al.* revealed that in Africa, NAM was underutilized by most non-orthodontic specialists, including pediatricians, general surgeons, and anesthetists [17]. Indira *et al* [18]. similarly noted that pediatricians seldom referred newborns for pediatric dental care immediately after CL/P diagnosis, indicating a broader systemic gap in interdisciplinary coordination.

Given the clear clinical benefits of NAM and the critical time window for its application, improving awareness among pediatricians and gynecologists is essential. These professionals are often the first to examine and counsel parents of newborns with CL/P. Their knowledge, or lack thereof, directly influences whether a child receives early and effective intervention.

In conclusion, although NAM is an effective and widely recognized pre-surgical intervention, this study highlights significant gaps in awareness and referral practices among pediatricians and gynecologists. Strengthening training, updating curricula, and promoting interdisciplinary communication are crucial to ensuring comprehensive care for CL/P patients [15].

Conclusion

Despite regular exposure to CLP cases, gynecologists and pediatricians in Gujarat display inadequate awareness about NAM therapy. Educational outreach, interdisciplinary workshops, and integration of dental professionals into neonatal care teams are urgently needed. Strengthening these areas could lead to timely referrals, improved surgical outcomes, and better long-term prognosis for affected children.

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