

## Different feeding methods for cleft lip and palate-a systematic review

Feeding Methods for Cleft Lip and Palate

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**Aim:** Children born with cleft lip or palate usually face many difficulties in feeding. Therefore, proper feeding methods are necessary for those children. The aim of this review is to compare different feeding methods for CLP (cleft lip and palate) as well as evaluate the best method for them.

**Material and Method:** This study covered the articles between 2000 and 2020. Related articles were selected and discussed for further extraction of data.

**Results:** Use of syringe, paladai bottle and bottle which is squeezable was considered best before the surgery. While the suction method was considered the best after the surgery.

**Discussion:** The suction method could be appropriate for CLP children, but the result showed that alternative methods were considered well.

**Keywords**

Syringe Paladai, Bottle, Cleft Lip, Cleft Palate

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## Introduction

Cleft lip and palate (CLP) are inherited deformities, which can affect lip, palate, or both [1] causing errors in facial fusion development in embryo [2] due to modifications in the normal development of primary as well as the secondary palate [3]. These children experienced many difficulties including deficiency of nutrition, front teeth deformities, otitis media and change or delay in the development of speech. It is a very challenging process to feed the CLP children and in nursing, the most important task is to educate parents about successful feeding [4]. Type and severity of cleft are the bases for feeding complexity in CLP infants. At the start, gain in weight can be a problem for nutritional deficiency and based on gender, they can have different problems [5,6]. When these children face such problems, they cannot develop normally and failed to adopt the social behavior, so they became incapable of accepting different social behaviors. In children, the nutritional problem is a general behavioral problem (Ashby JM: Feeding therapy and techniques for children with cleft lip/palate. C 2011. Available at: <http://opensiuc.lib.siu.edu/cgi/viewcontent>), which is observed in 25–50% of healthy infants.

Feeding difficulty is the most frequently reported problem concerned with CLP. These include the absence of effective sucking because of the failure of proper negative pressure, choking and milk vomiting via nasal cavity due to defects in the palate and facial structure resulting in less intake of food [7]. Children with CP (Cleft palate) faced more difficulties in feeding [8]. As a consequence, these children have the poor status of nutrition compared to others and gain weight improperly [7,9]. Furthermore, these complications have negative impacts on children's development and growth [10]. Various methods are present to solve these problems in oral cleft infants. Supplementary feeding along with breastfeeding is advised for infants to overcome their nutritional value [11]. Surgery is required for many reasons, including feeding.

The major distress for parents is feeding, as their children were diagnosed with a cleft lip/palate [12]. At the start, monitoring infant nutrition and weight is the main priority [7]. Surgery is considered the early treatment for patients with CLP. For lip palate, surgery is advised by three months, and for palate cleft 9 or 12 months are recommended, as the chronology of the method needs some changes, which depend on the center [13]. It is also important for the children to have proper nutrition so they can bear the different factors of surgery such as stable weight gain without changing health and the ability to receive anesthesia safely [14]. It is predicted that after surgery, children will face fewer feeding problems because many oral structures will be repaired. After surgery (palatoplasty), suction is recommended instead of BF/bottle for 6 weeks. Several centers followed protocols in which nipples and bottles were forbidden for 30 days [15]. Generally used techniques to aid in oral feeding for CP and CL infants include oral facilitation, positioning, pacing and assisted fluid delivery and variations in the fluid viscosity.

Based on the available literature, the aim of this systematic review is to compare different feeding methods for children with cleft lip and palate and to evaluate the best feeding method for children before and after surgery.

## Material and Methods

### Search strategy

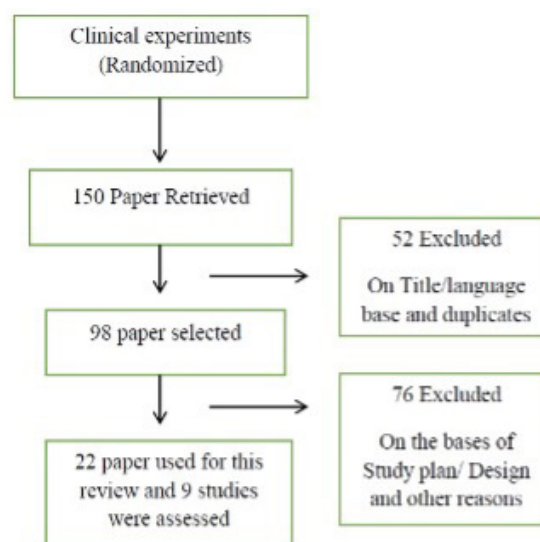
The search of the literature was carried out from 2000 to 2020. The search was executed in the PubMed/ Science Direct and Google Scholar databases because they contained most of the publications in this field. The search was conducted using the following Mesh terms: “Cleft palate; cleft lip; lip and palate cleft; feeding methods for cleft; feeding methods for lip and palate cleft”.

### Selection criteria

Papers, which compared different methods of feeding recommended for cleft children with the level of evidence 1b to 4 as proposed by the American Speech-Language-Hearing Association (ASHA) were included in this review. Those studies that described syndromes linked with CLP were excluded. For further integration, a manual search was conducted in chosen papers.

### Data analysis

The authors reviewed the articles to assess whether they meet the criteria or not. Then they read the full articles for extraction of data. The chosen data were then discussed by the authors.



**Figure 1.** Illustrate the search process

## Results

Initially, related articles were searched. Various articles were excluded on the basis of abstract and title because they were not comparing the different feeding methods of CLP children. After discussion by the authors, 9 studies were selected for this systematic review. These studies discussed the different conditions of feeding and linked methods. The characteristics of different feeding methods included were: methods which required BF and suction, do not require suction cup, feeding route alteration i.e., nasogastric tube, paladai, syringe and spoon and the attributes/parameters that were assessed in these studies were: performance of feeding, complication and time of feeding, growth and nutritional gain, volume and acceptance of ingested food, fistula presence and related complications, pain, analgesia, duration of stay in hospital and costs. Although breastfeeding is encouraged for CLP children, most of them did not perform well with bottle feeding and BF before surgery.

**Table 1.** Comparison of different feeding methods in CLP children

Author	LE	N	Age group	Cleft Type	Feeding method	Parameters assessed	Results
Assuncao et al, 2005 [20]	1b	23/22	3-13 months	Lip cleft	Spoon vs. Bottle and spoon	Intake calories, Anthropometrics, complication of wounds clinical analysis tests	Feeding with spoon and bottle showed better performance
Kent and Martin, 2009 [24]	3b	34/34	6-12 months	Palate	Bottle vs. Feeding tube	Pain, Feeding duration of hospital stay	Bottle: rejection of more food, prolonged and frequent feeding Tube: less duration of stay in hospital and lower analgesia need
Kim, 2009 [27]	1b	42/40	4-25 months	Palate	Cup, spoon and syringe vs. bottle	Sedation use, ingestion, Complications, weight gain	Both groups showed similar results. Bottle group had more intake on sixth day
Ize-Iyamu and Saheeb, 2011 [17]	1b	38/19	0-14 weeks	Palate	Spoon and cup vs. syringe	Feeding time, efficiency, gain in weight	Syringe had short feeding time and higher food volume and increase in weight gain.
Augsornwan et al., 2013 [21]	1b	96/96	3-6 months	Lip	Bottle/BF vs. syringe/spoon	Complications, satisfaction of parents	Alike results, parents more satisfied with BF/bottle
Hughes et al., 2013 [25]	1b	18/23	5-10 months	Involving the palate	OF vs. Tube	Pain, intravenous fluids, enteral feeding	OF group need more intravenous fluid while bottle group had high feeding volume
Trettene et al., 2013 [16]	4	88/88	11-18 months	Involving the palate	Spoon vs. Cup	Positioning, escape, volume accepted, choking, coughing feedingtime, caregiver safety	Less escape of food by using spoon and high volume received
Ravi et al., 2015 [18]	3b	50/50/50	2-12 months	Lip and palate	Bottle vs. Paladai vs. spoon	Anthropometrics, pattern of weight gain pattern	Before surgery paladai showed better performance while after surgery three groups showed improvements
Madhoun et al., 2020 [28]	---	---	8-14 months	Palate/Lip and palate	Bottle/BF	-----	The CL children were mostly successful in feeding through breast. Those with CP faced difficulties due to lack of suction

## Discussion

It has been reported that using a syringe for feeding is easy, practical, spent less time, less vomit and cause significant gain in weight [17]. Ravi et al. used a less known, alternative technique method, in which effects of different feeding methods i.e., with bottle, spoon and paladai on the pattern of weight gain were compared. Children fed with paladai showed greater improvements [18]. Though paladai use is not common, those studies are important which evaluate less common methods because these techniques ease the intake of food and energy-efficient for CLP children [19]. Similarly, a study compared the spoon vs. bottle and spoon and exhibited very similar results. The group which use spoon and bottle showed better result and group that use spoon faced discomfort [20]. When syringe/spoon was compared with bottle/BF, although they represented similar results but parents showed more satisfaction with bottle/BF [21]. The methods that did not use suction caused irritation which lead to tearful and restless. Suction is very important [22] and create bonding between child and mother and also develop oral motor skills [23]. A study said that those children fed via the nasogastric tube were more stable and they discharged from the hospital earlier. Parents were more satisfied while the other group which fed by using bottle showed rejection in feeding and prolonged and frequent feeding [24]. After surgery, the tube can damage the repair and may cause pain [25]. A study reported that the use of a spoon presented best as it showed less escape and more acceptance of food [16]. Another benefit with spoon feeding is that it provides high contraction of the muscle and oral stimulation as compared to use of cup [26].

## Conclusion

After surgery, the appropriate method of feeding for the children who have cleft lip/palate is suction. However, in some cases the alternative techniques e.g., syringe, bottle and paladai may be performed well. However, more studies are required for feeding methods before surgery.

## Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

## Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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## Conflict of interest

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