

Maternal Knowledge Regarding Feeding Practices and its Effect on Occlusion of Primary Dentition in Children: A Cross-sectional Study

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ABSTRACT

Background: Infant feeding practices are an important factor influencing malocclusion in deciduous dentition, which can have long-lasting negative outcomes on oral health-related quality of life. Hence, knowledge, attitudes and cultural practices of mothers are vital in prevention of this.

Objective: The present study was carried out to assess the mother's knowledge about feeding practices and its influence on primary dentition.

Materials and methods: The current study was a cross-sectional study of 187 mothers of 3- to 5-year-old children identified with malocclusion, conducted in the pedodontics department of tertiary care teaching dental hospital in South India.

Results: Majority of the mothers were graduates (31.6%) or undergraduates or postgraduates (42.8%). The duration of breastfeeding was 0–3 months in 9.1%, 3–6 months in 23%, 6–12 months in 30.5%, and >12 months in 37.5%. Bottle-feeding was reported by 21.4%. Only 52.4% of the mothers were aware about caries, and 66.2% were aware of malocclusion. The prevalence of malocclusion was 63.6% in study population, and the prevalence of caries was 30.5%. The most common type of malocclusion was overjet seen in 20.9% of study subjects. The proportion of children with crowding, open bite, and crossbite was 17.1, 15, and 10.7%, respectively. There was a gradually increasing trend in malocclusion awareness with increasing educational status of the mother which was statistically not significant (p value = 0.119). The proportion of malocclusion was highest in children who received breastfeeding between 3 months and 6 months and was highest (69.8%) in children who received bottle-feeding for more than 12 months. None of the factors had shown a statistically significant association with malocclusion in study population.

Conclusion: The prevalence of malocclusion is high in children, and mothers' awareness regarding malocclusion is poor.

Clinical significance: There is a need to educate mothers about proper feeding practices to prevent dental malocclusion.

Keywords: Dentition, Feeding practices, Maternal knowledge, Occlusion.

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INTRODUCTION

The harmonious growth and development of the jaws is dependent upon the oral and the perioral musculature, that of lips, tongue, and cheeks, which not only directs the occlusal development but also influences the growth of the jaws. The suckling phenomenon during breastfeeding is a highly physiologic phenomenon that promotes better orofacial development.¹

World Health Organization recommends that exclusive breastfeeding for the first 6 months of life is essential to achieve optimal growth and development.² Optimal breastfeeding offers benefits like protection against gastrointestinal infection, influencing growth, and prevents the child from acquiring nonnutritive sucking (NNS) habits.³ On the contrary, inadequate breastfeeding is found to be detrimental not only to the psychological development, immunity, and overall health of the child⁴ but also to the craniofacial development.¹ Breastfeeding is considered to be a nutritive sucking habit that aids in preventing malocclusion in the primary dentition.^{5,6}

Evidence suggests that malocclusion in deciduous dentition is influenced by the combined effect of genetic and environmental factors, and the commonly identified environmental factor is changes in the feeding practices.^{7–9} Proper development of permanent dental arches essentially depends upon the foundation of deciduous dental arches. Nonnutritive sucking like use of pacifier, digit, or dummy sucking has often found to be an important etiologic factor in the development of posterior crossbites^{10,11} or non-mesial step malocclusion.^{12,13} It is worthwhile to consider

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that malocclusions have long-lasting negative outcomes on oral health-related quality of life especially in the social and emotional aspects of well-being.¹⁴

The knowledge, attitudes, and cultural practices of parents especially mothers seem to play an active role in the oral health of the preschool children who are totally dependent on them for dental care. Nonoptimal or sometimes harmful feeding habits, oral hygiene practices, and lack of awareness about the importance of maintaining a healthy primary dentition are highly prevalent among the mothers¹² especially in countries like India.¹⁵ But the adverse

effects of feeding practices on developing dentition have been a subject of controversy. Hence, the present study was carried out to assess the mother's knowledge about feeding practices and its influence on primary dentition.

MATERIALS AND METHODS

Study Design

The study was a cross-sectional study.

Study Population

The study has included 3- to 5-year-old children for assessment of dental malocclusion and their mothers to assess the knowledge regarding feeding practices and its impact on dental malocclusion.

Study Setting

The study was conducted in the pedodontics department of tertiary care teaching dental hospital in South India.

Sample Size

A total of 249 children were screened and 187 children were included in the final study.

Sampling Method

All the eligible study subjects were recruited into the study consecutively, hence no sampling was done.

Inclusion Criteria

- Full-term children were selected to ensure a healthy sample selection;
- Presence of normal number, size, and shape of teeth;
- Absence of any local/systemic condition.

Exclusion Criteria

- Mother's refusal to give the informed consent;
- Children with missing/malformed/supernumerary teeth;
- Children with large restorations and extensive carious lesions.

Ethical Issues

The study was approved by institutional human ethics committee. Informed written consent was taken from the parents of all the study participants. Confidentiality of the study participants was maintained throughout the study.

Data Collection Tools

The data were collected in a structured proforma, which has documented details regarding the sociodemographic parameters, knowledge- and attitude-related parameters, and dental occlusion pattern by clinical examination.

Study Procedure

After obtaining the informed written consent, mothers were administered the questionnaire to elicit all the relevant information mentioned above. Examination in children was carried out to assess occlusion of teeth, including open bite, crossbite, overjet increase, crowding, and caries status.

Statistical Analysis

A descriptive analysis of all the parameters was done using mean and standard deviation for quantitative variables, frequency, and

proportion for categorical variables. The presence of malocclusion was the primary outcome variable; the presence of caries was the secondary outcome variable. Maternal knowledge and sociodemographic parameters were considered as explanatory variables. The association between the explanatory and outcome variables was done by cross tabulation and comparison of proportions using chi-square test. A *p* value of <0.05 was considered as statistically significant. IBM SPSS version 22 was used for the statistical analysis.

RESULTS

A total of 187 children were included in the study. The educational status of the mothers up to 12th standard was 25.7%, 31.6% undergraduates, and 42.8% were postgraduates. Out of 187 children, 9.1% were breastfed 0 to 3 months, 23% from 3 to 6 months, and 30.5% from 6 to 12 months. A total of 37.5% of the study participants' breastfed their baby for more than 12 months. A total of 21.4% of the women reported nil bottle-feed and 78.6% reported bottle-feed (Table 1).

A total of 52.4% of the mothers were aware about caries and 66.2% of the mothers were aware of malocclusion (Table 2).

The prevalence of malocclusion was 63.6% in study population, and the prevalence of caries was 30.5% (Table 3).

The most common type of malocclusion was overjet seen in 20.9% of study subjects. The proportion of children with crowding, open bite, and crossbite were 17.1, 15, and 10.7%, respectively (Table 4).

The proportion of mothers with awareness about caries was at par (55.9%) in undergraduate and postgraduate mothers (55%),

Table 1: Descriptive analysis of baseline parameters in study population

| Parameter | Frequency | Percentage |
|---------------------------|-----------|------------|
| Educational qualification | | |
| Up to 12th standard | 48 | 25.7 |
| Undergraduate | 59 | 31.6 |
| Postgraduate | 80 | 42.8 |
| Breastfeeding | | |
| 0 to 3 months | 17 | 9.1 |
| 3 to 6 months | 43 | 23.0 |
| 6 to 12 months | 57 | 30.5 |
| >12 months | 70 | 37.5 |
| Bottle-feeding | | |
| 0 to 3 months | 5 | 2.7 |
| 3 to 6 months | 16 | 8.6 |
| 6 to 12 months | 30 | 16.0 |
| >12 months | 96 | 51.3 |
| No bottle | 40 | 21.4 |

Table 2: Awareness about caries and malocclusion

| Parameter | Frequency | Percentage |
|------------------------------|-----------|------------|
| Awareness about caries | | |
| Yes | 98 | 52.4 |
| No | 89 | 47.6 |
| Awareness about malocclusion | | |
| Yes | 124 | 66.3 |
| No | 63 | 33.7 |

Table 3: Prevalence of malocclusion and caries among children

| Parameter | Frequency | Percentage |
|-------------------------|-----------|------------|
| Alteration of occlusion | | |
| Yes | 119 | 63.6 |
| No | 68 | 36.4 |
| Caries | | |
| Yes | 57 | 30.5 |
| No | 130 | 69.5 |

Table 4: Types of malocclusion in study population

| Type of malocclusion | Frequency | Percentage |
|----------------------|-----------|------------|
| Overjet | 39 | 20.9 |
| Crowding | 32 | 17.1 |
| Open bite | 28 | 15.0 |
| Crossbite | 20 | 10.7 |
| No alteration | 68 | 36.4 |

Table 5: Association between educational qualification and awareness about caries and malocclusion

| Awareness | Yes (%) | No (%) | Chi-square | p value |
|------------------------------|-----------|-----------|------------|---------|
| Awareness about caries | | | | |
| Up to 12th standard | 21 (43.8) | 27 (56.3) | 1.952 | 0.377 |
| Undergraduate | 33 (55.9) | 26 (44.1) | | |
| Postgraduate | 44 (55.0) | 36 (45.0) | | |
| Awareness about malocclusion | | | | |
| Up to 12th standard | 27 (56.3) | 21 (43.8) | 4.252 | 0.119 |
| Undergraduate | 38 (64.4) | 21 (35.6) | | |
| Postgraduate | 59 (73.8) | 21 (26.3) | | |

while it was 43.8% in mothers whose educational level was up to 12th standard (Table 5). The association between the educational status and caries awareness was statistically not significant (p value = 0.377). There was a gradually increasing trend in malocclusion awareness with increasing educational status of the mother from 56.3% in mother studied up to 12th standard to 73.8% in mothers who were postgraduates. This increasing trend was also statistically not significant (p value = 0.119).

The prevalence of malocclusion was highest (72.9%) in children with mothers' educational status up to 12th standard. In the other two groups, the prevalence was similar at 61.3% (Table 6). There was no statistically significant association between awareness level and the proportion of malocclusion. The proportion of malocclusion was highest in children who received breastfeeding between 3 months and 6 months and was highest (69.8%) in children who received bottle-feeding for more than 12 months. None of the factors had shown a statistically significant association with malocclusion in study population.

DISCUSSION

Breastfeeding is the ideal mode of feeding for newborns and infants. It delivers infants with all of the nutrients needed. The antibodies in breast milk offer protection from common childhood diseases such as diarrhea and pneumonia.^{16,17} When the duration of breastfeeding is reduced, it may result in child indulging in NNS habits as they can soothe the infant, pacify their teething discomforts, and may even relax them during stressful events.

Table 6: Factors influencing malocclusion

| Explanatory parameter | Alteration of occlusion | | Chi-square | p value |
|------------------------------|-------------------------|-----------|------------|---------|
| | Yes (%) | No (%) | | |
| Educational qualification | | | | |
| Up to 12 standard | 35 (72.9) | 13 (27.1) | 2.458 | 0.293 |
| Undergraduate | 49 (61.3) | 31 (38.8) | | |
| Postgraduate | 49 (61.3) | 31 (38.8) | | |
| Awareness about caries | | | | |
| Yes | 69 (70.4) | 29 (29.6) | 4.080 | 0.031 |
| No | 50 (56.2) | 39 (43.8) | | |
| Awareness about malocclusion | | | | |
| Yes | 81 (65.3) | 43 (34.7) | 0.452 | 0.303 |
| No | 38 (60.3) | 25 (39.7) | | |
| Breastfeeding | | | | |
| 0 to 3 months | 11 (64.7) | 6 (35.3) | 2.209 | 0.530 |
| 3 to 6 months | 30 (69.8) | 13 (30.2) | | |
| 6 to 12 months | 38 (66.7) | 19 (33.3) | | |
| >12 months | 40 (57.1) | 30 (42.9) | | |
| Bottle-feeding | | | | |
| 0 to 3 months | 2 (40.0) | 3 (60.0) | 6.121 | 0.190 |
| 3 to 6 months | 10 (62.5) | 6 (37.5) | | |
| 6 to 12 months | 20 (66.7) | 10 (33.3) | | |
| >12 months | 67 (69.8) | 29 (30.2) | | |
| No bottle | 20 (50.0) | 20 (50.0) | | |

Such practices can lead to disturbances in orofacial equilibrium, which has been associated with various malocclusions.¹⁸

About 32% of the mothers reported that breastfeeding was done for a maximum of 6 months. In their study of 5- to 6-year-old children, Agarwal et al.,¹⁹ reported that NNS habits like digit sucking, dummy, or pacifier sucking to be significantly higher among those breastfed for less than 6 months. They further inferred that children who had breastfeeding <6 months had fourfold increased risk of developing posterior crossbite when compared with those with ≥6 months breastfeeding.

About 51% of the children in the present study have been bottle-fed for at least 12 months. Prolonged bottle-feeding has been found to increase the risk in the development of non-mesial step malocclusion.¹² Evidence seems to be mixed regarding the effect of prolonged breastfeeding on deciduous dentition, with some studies reporting an increased tendency of open bite and posterior crossbite,^{20,21} while others pointing to the protective effect of breastfeeding beyond 12 months.²²⁻²⁴ However, in their systematic review, Hermont et al.,⁹ inferred that overall breastfeeding can offer protection against malocclusion or favor normal occlusion.

Our study found the prevalence of malocclusion to be 63.6% in study population. A lower prevalence was reported in the studies by Lopez Del Valle et al.¹⁸ (42.8%), with the prevalence of crowding to be 17.1%: open bite being 15% and crossbite to be 10.7%.

Regarding the awareness of mothers, there was higher awareness among the mothers with higher educational status regarding malocclusion. However, awareness to malocclusion was more than dental caries. It needs no further emphasis to say that parents, particularly the mothers, are directly responsible to the dental health of their offspring in preventing oral diseases, and hence, awareness about the feeding practices, caring for primary

dentition, should be regularly provided to them through outreach activities.

It should be noted that inherent to the limitation of a cross-sectional design of the study, recall bias in the form of accuracy in reporting breastfeeding or bottle-feeding status may not be accurate, and hence, inferring the effect of causation is not warranted. However, despite the weak evidence concerning the association between the duration of bottle-feeding and malocclusion in the primary dentition, it seems judicious to interrupt this habit as soon as possible until further evidence is obtained.⁹

The American Academy of Pediatrics recommends parents to encourage their infants aged 1 year to be weaned using cups instead of a bottle in order to avoid early childhood caries.²⁵

CONCLUSION

The findings of the study revealed that feeding patterns were not associated with prevalence of malocclusion. Mothers in the study had basic knowledge on feeding practices and its association with caries and malocclusion. However, their theoretical knowledge has not been fully reflected in the way they cared for their children's teeth. Longitudinal studies assessing the relationship between malocclusion and different feeding methods considering the phenotypes of parents and their children would provide useful data on the perception of etiology of analyzed malocclusion.

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