



## Study of Feeding Practices and Vaccination Status Effect on Growth and Illness in Children of 6months to 2years

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**Financial Support:** None declared

**Conflict of Interest:** None declared

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### How to cite this article:

Vora HD, Reddy DV, Prajapati VJ, Chaudhari HK. Study of Feeding Practices and Vaccination Status Effect on Growth and Illness in Children of 6months to 2years. Natl J Community Med 2017; 8(7):385-389.

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**Date of Submission:** 12-05-17

**Date of Acceptance:** 27-07-17

**Date of Publication:** 31-07-17

## ABSTRACT

**Introduction:** feeding practices and vaccination status are the major determinants of a child's growth and nutritional well-being.

**Objective:** is to identify the factors affecting the growth pattern and causing illnesses in children less than 2 years based on their feeding and vaccination practices.

**Methods:** This cross sectional observational study was conducted at the pediatrics outpatient department (OPD) attached to a tertiary care center, Shardaben Hospital, Smt.NHL Municipal Medical College, Ahmedabad, over a period of three months, September to November 2016. All written questionnaires were administered to the mother of the child aged 6 months to 2 years.

**Results:** Out of the 351 children in the study, 61.8% were exclusively breast fed up to 6 months. 12 (3.4%) were non vaccinated, 76(21.7%) partially vaccinated, 42(12%) were severely malnourished. Among those children who were not exclusively breast fed till 6m, had higher incidence of illnesses and severe malnutrition. From the 12(3.4%) children who were non vaccinated, 8(66.7%) had diarrhea, 3(25%) had pneumonia and 3(25%) severely malnourished.

**Conclusions:** This study shows with certainty that feeding and vaccination practices are some of the major determinants of a child's overall wellbeing.

**Key words:** Exclusive breastfeeding, complementary feeding, vaccination, malnutrition.

## INTRODUCTION

Proper feeding and immunization practices by a caregiver are necessary for the growth, development and the overall health of a child. There is sufficient evidence of cause effect for certain preventive interventions such as exclusive breastfeeding in the first six months in the prevention of diarrhea, pneumonia and neonatal sepsis; complementary feeding in preventing diarrhea, pneumonia, measles and malaria; and vitamin A in prevention of diarrhea<sup>1</sup>.

Malnutrition contributes globally to about 60% of under-five mortality per year, among which more than two-thirds are due to improper feeding practices<sup>2</sup>. An analysis showed that appropriate breast-

feeding and complementary feeding practices can alone prevent under-five deaths by 19%<sup>1</sup>. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life and the addition of complementary feeds from six months onwards, with continued breastfeeds till at least two years of age<sup>3, 4</sup>.

In spite of the many efforts by the government and the health care professionals in the form of information, education and training campaigns, the prevalence of proper feeding practices still remains low in our country. From under-five children in India, 43% are underweight and 48% are stunted due to chronic undernutrition. Only 25% of newborns were put to the breast within one hour of

birth and 46% are exclusively breastfed<sup>5</sup>. Multiple evidence based studies have shown the importance of human milk, concluding that feeding practices of an infant should be considered as a basic health issue and not a lifestyle choice<sup>6</sup>.

In a study of children under 2 years of age in Guinea-Bissau, Kristensen et al. (2000)<sup>7</sup> found immunization with Bacille Calmette Guerin (BCG) vaccine to be associated with lower mortality, but stated that oral polio vaccine (OPV) and diphtheria, tetanus, polio (DTP) vaccines were associated with higher mortality. Rotavirus is the single most important cause of severe diarrhoea in children globally causing more than half a million deaths among children under 5 years of age<sup>8</sup>. Similarly pneumococcal conjugate vaccines (PCVs) have been shown to be highly efficacious against serotype-specific invasive disease, chest radiograph-confirmed pneumonia, and otitis media (OM)<sup>9</sup>.

As there is a paucity of literature on the feeding practices and vaccination status effects in this region, the present study was undertaken to assess the feeding practices of mothers having children under-two years of age.

## MATERIALS AND METHODS

It is was across sectional observational study (designed as a questionnaire based survey) conducted at the pediatrics outpatient department (OPD) catering to children from birth to 18 years of age attached to a tertiary care center, Shardaben Hospital, Smt.NHL Municipal Medical College, located at Ahmedabad, Gujarat, India, over a period of three months from September 2016 to November 2016. All the mothers having children from 6 months to 2 years of age attending the OPD were interviewed after taking an informed oral consent. All children with known no nutritional, congenital or acquired reasons (e.g., congenital heart diseases, cerebral palsy, genetic disorders, and tuberculosis) of failure to thrive were excluded.

Qualifying criteria were that neither the mother nor the infant could have a medical condition at birth that would affect feeding. Infant-mother pairs were disqualified if the infant was reported to have a serious, long-term health problem that would affect feeding. Each questionnaire asked about such problems, and the reported problems were evaluated by the same doctor who performed this evaluation.

The questionnaire administered to the mother collected information on the general characteristics of the participants and their children, knowledge, attitude and practices on early initiation of breastfeeding, exclusive breastfeeding for up to six

months and introduction of complementary feeding based on the mother's recall memory. It consisted of 23 questions on feeding practices and morbidities of children (diarrhea and acute respiratory illnesses/pneumonia).

The weight and length of the children were measured using a digital weighing scale and an infantometer respectively and weight forage classification was used to estimate the nutritional status of children using the z-score cut-off point of the WHO Global Database on Child Growth and Malnutrition which uses a Z-score cut-off point of <-2 SD to classify low weight-for-age, low height-for-age and low weight-for-height as moderate and severe undernutrition, and <-3 SD to define severe undernutrition<sup>10</sup>.

According to WHO definitions of infant feeding terms 2002:<sup>11</sup>

**Exclusive breastfeeding:** Breastfeeding while giving no other food or liquid, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

**Complementary food:** Any food, whether manufactured or locally prepared, suitable as a complement to breast milk or to infant formula, when either becomes insufficient to satisfy the nutritional requirements of the infant. Any child not taking feed as mentioned above was regarded as having inadequate complementary feeding.

The questionnaire was in English but the interviews were conducted in local language (Gujarati/Hindi) as per the guardian's convenience. The OPD runs between 9:00 a.m. and 12:30 p.m. and between 2:00 p.m. and 4:00 p.m. Interviews were conducted between 10 a.m. and 12:00 p.m. and each interview took approximately 15 to 25 minutes to finish. Data entered in Microsoft excel and analyzed by using SPSS software version 20.

## RESULTS

A total of 351 eligible mothers participated in the study. All the 351(100%) mothers reported having put their infants to the breast. The majority of them (59.8%) (Table 1) reported to have started breastfeeding within the first hour after delivery. There was a significantly higher proportion of children who were exclusively breastfed up to six months (61.8%) (Table 1). The study showed that mothers were generally aware of the concept of exclusive breastfeeding and most of them had a positive perception about it. The main barrier to practicing EBF was that the caregiver feared that mothers may not have adequate breast milk and would need to introduce other feeds early.

**Table 1: Scoiao demographic profile of study participants**

Socio-demographic variables	Children(%)
Children in the study	351
Boys	232 (66.1)
Girls	119 (33.9)
Exclusively breast fed till 6 months	217 (61.8)
Children with adequate CF	175 (49.8)
Non vaccinated	12 (3.4)
Partially vaccinated	76 (21.7)
Completely vaccinated	263 (78.3)
Starting BF within 1 <sup>st</sup> hour of life	210 (59.8)
-1 to -3SD (Mild - Moderate Malnutrition)	257 (73.2)
>-3SD (Severe Malnutrition)	42 (12)

CF=Complementary feeding; BF= Breast feeding

Out of a total of 351 children, 175(49.8%) (Table 1) had adequate complementary feeding. Complementary feeding was started by the mothers or caregivers either based on information received from a doctor or based on some signs like crying a lot, an increase in appetite and wanting to breast-

feed more often than usual. The most commonly introduced complementary food at six months was dal water and biscuits. Fruits, commonly bananas and oranges, were mentioned as being common complementary foods that were given to children.

Severe malnutrition, not starting breastfeeding within 1st hour of birth and non-completion of vaccination were associated with increased diarrhea episodes.

The Chi square test of significance showed statistically significant correlation with p value <0.05 between those children with partially or non-vaccinated states, with inadequate complementary feeding and diarrhea (Table 2). Also the test showed highly significant p values <0.005 for correlation between children who were not exclusively breast fed till 6 months and had illnesses and severe malnutrition and those were non vaccinated/received inadequate malnutrition and had severe malnutrition (Table 3).

**Table 2: Variables associated with illness**

Variables	Diarrhea (n=128)	Pneumonia (n=24)	Total (n=351)	p value-Diarrhea	P value-Pneumonia
<b>Breast Feeding</b>					
Exclusive BF till 6 m	45 (35.1)	7 (29.1)	217 (61.8)	<0.001	<0.001
Exclusive BF <6m	83 (64.8)	17 (70.8)	134 (38.2)		
<b>Vaccine status</b>					
Non vaccinated	8 (6.2)	3 (12.5)	12 (3.4)	<0.05	<0.01
Partially vaccinated	64 (50)	12 (50)	76 (21.7)		
Complete vaccinated	56 (43.8)	9 (37.5)	263 (74.9)		
<b>Adequacy of BF</b>					
Adequate	36 (28.1)	9 (37.5)	175 (49.9)	<0.05	<0.01
Inadequate	92 (71.9)	15 (62.5)	176 (50.1)		

BF= Breast feeding; Figure in the parenthesis indicate percentage

**Table 3: Variables associated with nutrition**

Variables	Normal (n=150)	Mild-moderate Malnutrition (n=171)	Severe malnutrition (n=30)	Total (n=351)	P value
<b>Breast Feeding</b>					
Exclusive bf till 6 m	128 (85.3)	83 (48.5)	6 (20)	217 (61.8)	<0.001
Exclusive bf <6m	22 (14.7)	88 (51.4)	24 (80)	134 (38.2)	
<b>Vaccine status</b>					
Non vaccinated	0	9 (5)	3 (10)	12 (3.4)	<0.01
Partially vaccinated	18 (12)	39 (22.8)	19 (63.3)	76 (21.7)	
Complete vaccinated	132 (88)	123 (71.9)	8 (26.7)	263 (74.9)	
<b>Adequacy</b>					
Adequate	117 (78.0)	56 (32.7)	2 (6.7)	175 (49.1)	<0.001
Inadequate	33 (22.0)	115 (67.2)	28 (93.3)	176 (50.9)	

BF= Breast feeding; Figure in the parenthesis indicate percentage

## DISCUSSION

Exclusive breastfeeding and early initiation of breastfeeding are two of the most important factors affecting breastfeeding practices infants younger than 6 months of age<sup>12</sup>. In the present study 59.8% of the children received breastfeeding within one

hour of birth. Similarly a study done at Karamsad<sup>13</sup>, Gujarat showed that 57.5% of mothers initiated breast feeding within one hour of delivery. However, the National Family Health Survey (NFHS-3) 2005-2006 estimates are lower for India and Gujarat being 23.5% and 25.4%, respectively<sup>14</sup>. The higher percentage found in our study can be attributed to

the repeated education of mother and relatives regarding the need for early initiation of breast feeding during twice daily postnatal ward rounds. Discrepancies from other Indian studies can be due to regional and cultural differences. Delayed initiation of breastfeeding has been recognized as a risk factor for neonatal mortality and according to a previous study, an estimated 22% of neonatal deaths could be prevented if breastfeeding was started within the first hour after birth.<sup>15</sup>

Exclusive breastfeeding during the first 6 months and therefore timely introduction of complementary feeding have many proven advantages to both the mother and the child and are therefore the prime focus in infant feeding promotional activities. In our study we observed 61.8% of the infants exclusively breastfed till complete six months. All these children who were exclusively breast fed till 6 months had lesser rates of illnesses and severe malnutrition which was a significant finding in our study. Similar rates were observed by Nimbalkar et al. (55.9%).<sup>16</sup> Last NFHS-3 data showed that from 6th month onwards 55.8% and 57.7% of infants received complementary feeding in India and Gujarat, respectively. An estimated 10% to 15% of under-five deaths in resource poor countries could be prevented if 90% of babies were exclusively breastfed for the first 6 months.<sup>1</sup>

The current rates of proper feeding practices are still well below the guidelines for Infant and Young Child Feeding. Late initiation of breastfeeding, nonexclusive breastfeeding and bottle-feeding are still prevailing. Antenatal counseling, hospital delivery, and training of grass root workers are being conducted in the IYCF to improve child feeding practices with no expected outcome. There is an alarming need of a prospective educational intervention study or new innovative practices to achieve the optimum feeding practices in children under the age of five years.

Some mothers had a perception that introducing the baby to solid feeds needed to be preceded by a period of first feeding the baby on dal water. This meal is usually not enriched with other foods. The complementary foods do not meet with the recommended standards by the IYCF. Only 49.8% of children aged six-twenty three months were fed in accordance to IYCF practice minimum standard<sup>17</sup>. Those children who had adequate complementary feeding in our study showed lesser incidence of illnesses (28.1% and 37.5% of diarrhea and pneumonia respectively) (Table 2) and severe form of malnutrition (6.7%) (Table 3).

Children who had been partially or non-vaccinated were major contribution in this study for malnutrition and illnesses majorly pneumonia (62.5%).

Adherence to the recommended feeding practices by the children caretakers has beneficial effect on the growth of the infant and young child.

## CONCLUSION

This study concluded that children who were not exclusively breast fed, had inadequate complementary feeding and not vaccinated had higher incidence of illness and significant malnutrition when compared with children with proper feeding practices and complete vaccination status.

Although breast feeding is a universal practice, early introduction of top feeds, giving water to breast fed babies and late introduction of semisolids are common problems in infant feeding practices which significantly contributes to malnutrition.

Mothers need to be educated during antenatal and every other opportunity regarding exclusive breast feeding, adequate complementary feeding and need for complete immunization.

The global strategy on infant and child feeding adopted by World Health Assembly in 2002 is most appropriate in our situation for adequate growth and development of young children. Knowing that most of the mothers will breastfeed and have heard about appropriate breastfeeding practice, is important in the development of sustainable strategies required to improve feeding practices and thus nutritional status of children.

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