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RESEARCH ARTICLE

ASSESSMENT OF INFANT AND YOUNG CHILD FEEDING PRACTICES AND NUTRITIONAL STATUS OF 0 TO 2 YEARS CHILDREN

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ABSTRACT

Background: Appropriate infant and young child feeding practices are essential for optimal growth, cognitive development and overall wellbeing in early vulnerable years of life. (WHO) World Health Organization recommends exclusive breast feeding up to six months, addition of complementary feeds after completion of six months onwards and continued breast feeding till two years of life. Apart from exclusive breast feeding initially, time of introduction, content and consistency of complementary feeds are critical for early nutrition. Inadequate and inappropriate (IYCF) practices lead to malnutrition, followed by growth retardation and fatal outcomes.

Methods: A cross sectional study was conducted at immunization OPD at Aundh civil hospital ,a tertiary care centre in Pune over a period of one month of September.63 mother with children of 0 to 2 years dyads were included in study .A pretested ,validated questionnaire adapted from BPNI IYCF questionnaire was used. Assessment of IYCF practices and nutritional status of children (length, weight and MUAC) was done. ICFI score (Infant Child Feeding Index) was used as a single indicator for complementary feeding practices in 6 to 24 months children. Length, weight were compared with Z score charts of WHO.

Result: 31 male and 32 participants of age 0 to 24 months were included in study.23 participants were of 0 to 6 months age and 40 participants in 6 to 24 months age group. Children delivered by caesarean were 26(41.3%).Children delivered in government setup were 26(41.3%). Prelacteal feed was given in 31(49.2%) of which honey was given in 5(7.9%) and formula milk was given in 23(36.9%) newborns .Initiation of breastfeeding within one hour was done in 28(44.4%) participants. Exclusive breastfeeding was done in 29 (44.4%) participants. Complementary food introduced at completion of 6 months in 34(85%) participants. Total number of bottle fed children was 3(4.8%). (IFCI) infant child feeding score of six was seen in 45% children. Assessment of children in study group had showed stunting in 6(9.5%) participants and wasting was seen in 7(11.11%) children.6 (9.5%) were underweight and moderate acute malnutrition was seen in 7(11.11%) children. Place of birth was statistically significant (p value <0.001) with respect to type of delivery, feed, early initiation of breast feeding and exclusive breastfeeding. An odd of early initiation of breastfeeding was 15 times greater in government hospital, and that of exclusive breastfeeding was 7 times greater in government hospital.

Conclusion: IYCF practices were found to be good in children delivered in government setup as compared to private setup. ICFI score did not found statistically significant with nutritional status of children in study group. Stunting was seen in 6(9.5%) children. Moderate acute malnutrition was seen in 7(11.11%) and 6(9.5%) were underweight and wasting was seen in 7(11.11%) children.

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INTRODUCTION

Appropriate Infant and young child feeding (IYCF) practices are essential for optimal growth, cognitive development and overall well being in early vulnerable years of life.

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Malnutrition contributes to about 60% of under five mortality worldwide annually and over two thirds of these are due to inappropriate feeding practices. An analysis showed that appropriate breast feeding and complementary feeding practices can alone prevent under five deaths by 19%. The world Health organization (WHO) recommends exclusive breast feeding up to 6 months and the addition of complementary feeds from six months onwards with continued breast feeding till at least two years of life. Apart from

exclusive breast feeding initially, time of introduction, content and consistency of complementary feeds are critical for early nutrition (Lakshman *et al*.). The early introduction of complementary feeds before age of 6 months can lead to displacement of breast milk and increased risk of infections as the babies are physiologically immature. Similarly inadequate and inappropriate complementary feeding with unhygienic practices leads to recurrent and persistent infections and malnutrition which is followed by growth retardation, immunodeficiency and eventually fatal outcomes. This is a concern for Indian scenario, where previous studies have suggested inability to maintain exclusive breast feeding and late introduction of complementary feeds. Breast feeding, though is a natural act, it is a behavior that needs to be learned. Mother and other caregivers need active assistance for optimum breast feeding practice. The Global strategy for infant and young child feeding describes the essential interventions to promote, protect and support exclusive breast feeding (Pai *et al*., 1999). Multiple efforts are being done to improve feeding practices in Children. WHO and United Nations Children's fund (UNICEF) launched the Baby – Friendly Hospital initiative in 1992, integrated management of Childhood Illness (IMCI) in mid – 1990 s, and IYCF in 2002 which stress the importance of breast feeding. All these programs have been adopted by India since the last one to two decades to promote appropriate feeding practices in children under – five years. Appropriate breast feeding and complementary feeding practices depend on knowledge and support from the family, community and health care system. Inadequate knowledge about feeding practices is an equally important determinant of malnutrition, as is the lack of adequate and hygienic food.

However in spite of all the efforts as information, education, or training campaigns, the prevalence of proper feeding practices remains low. India hosts more than one – third of the world's children who are wasted. From under five children in India, 43% are underweight and 48% are stunted, due to chronic malnutrition. Only 25% of newborns were put to the breast within one hour of birth and 46% are exclusively breastfed. (http://whqlibdoc.who.int/pu blications/2009/97 89241597494_eng.pdf; http://www.pedia triconcall.com/Jo urnal/Article/Full Text.aspx?artid=265&ty pe=J&tid=&imgid= &reportid=150&tbltype=#) Multiple factors are responsible for this slow improvement in nutritional health indicators in India. According to World Bank Report, India's Integrated Child Development Services (ICDS) needs to undergo significant changes address the current malnutrition crisis in India. Adequate data in Pune city is not available about Infant Young Child Feeding practices that's why the present study is undertaken to assess the feeding practices of mothers having children of 0 – 2 yrs. of age and nutritional status of children in same age group.

MATERIALS AND METHODS

Study Design: A Cross sectional study was conducted involving 63 mother children dyads.

Study setting and participant: The study was conducted in Immunization OPD of Aundh Civil Hospital., Pune, and Maharashtra from 1st September 2017 to 30 September 2017. Children of 0 to 2 years age group visiting Immunization OPD of Aundh civil hospital.

Sample size: Prevalence of exclusive breast feeding is 52.1% by NFHS 4 data of India urban area.

Formula used for Sample Size- $4PQ/ d^2$

- P = Prevalence (52%) = 0.52
- Q = 1- P = (0.48)
- d = Margin of error (13%) = 0.13
  = 4*0.52*0.48/0.0169 = 59.07.
  Sample Size= 60.

In this study sample size was 63.

Sampling technique: Convenient, purposive sampling method was used which is non probability sampling.

Inclusion Criteria: 0-24 month's children and mothers visiting Immunisation OPD Aundh Civil Hospital.

Exclusion Criteria: HIV positive babies and mothers will be excluded as AFASS criteria is predecided before delivery.

Data Collection: Questionnaire A pretested, validated, semi structured questionnaire adapted from standardized BPNI infant young child feeding questionnaire was used for data collection. Sociodemographic characters like parent's age, education, family type, income per month were added. Parent's education, occupation and monthly income were classified according to updated Kuppuswamy scale. Children under two years of age were assessed and mothers were interviewed for IYCF practices.

Weight: Weight was recorded using digital weighing scale nearest to 0.1kg. Before each and every recording setting of the digital weighing scale was done to 0.00.Children who can stand were weighed in standing position and those who cannot stand were weighed in lying position.

Length: Length was used using infantometer nearest to 0.1 cm. Before measuring length shoes were removed. Height for age was compared and classified with WHO growth reference data. Degree of nutritional status was computed using Z score classification of weight for age, height for age and weight for height of WHO reference data and classified as normal (Median+/-2SD), stunted between -2SD to -3SD and less than –3SD severe stunted. Same is applicable to underweight and wasting.

MUAC (Mid Upper Arm Circumference): Mid upper arm circumference of each and every child was taken, that is both below 6 months and above 6 months age of children. MUAC measured on left arm. Left hand of the child was folded in elbow in right angle, close to abdomen. Two points were marked, one on the tip of acromion process (shoulder) and another on tip of olecranon (elbow).Length were measured in between these two points and a midpoint was marked. MUAC tape is used to measure the circumference at this point. Depending on the MUAC nutritional status was classified as SAM (Severe Acute Malnutrition): MUAC less than 11.5cm (Red zone of MUAC tape). MAM (Moderate Acute Malnutrition): MUAC between 11.5 TO 12.5 cm. (Yellow zone of MUAC tape). Normal: MUAC more than 12.5cm. (Green color zone of MUAC tape)

ICFI Score (Infant Child Feeding Index): A single parameter used in children in age group 6 months to 24 months. Breast feeding, meal frequency and dietary diversity. A score of 6 is a good score. Children in 6 to 24 months divided in 6 to 8 months, 9 to 11 months and 12 to 24 months. Breastfeeding was scored as 2 in 6 months to 11 months and 1 in 12 months to 24 months. Meal diversity is scored 1 and 2 scores in 6 months to 24 months. Meal frequency scored as 1 or 2 in six months to 11 months and scored as 1, 2 or 3 in 12 to 24 months. (http://whqlibdoc.who.int/publications/2009/9789241597494_eng.pdf)

Data Analysis: All data collected was entered in Microsoft excel 2007 and analyzed in Statistical Package for Social Sciences (SPSS) using version 23 software for descriptive and inferential statistics.

RESULTS AND DISCUSSION

Male and female children were 31 and 32 respectively. Study group children were divided in to 0 to 6, 7and 8 months, 9-11 months and 12 to 24 months according to their nutritional requirements. According to NFHS 4 data 88.7% are institutional births of which 46.2% births in public facility.

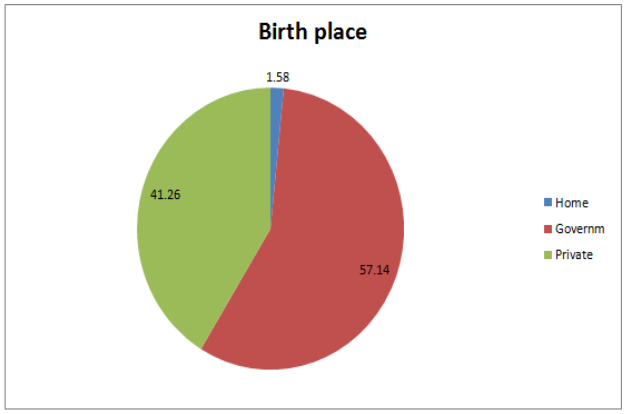

Fig 1. Distribution of Birth Place of Children

Table 1. Age and Gender distribution of 0 to 2 years children

S.No	Variables	N	%
1	0-6 months	23	36.5
	7-8 months	7	11.1
	9-11 months	17	27
	12-24 months	16	25.4
2	Gender		
	Male	31	49.2
	Female	32	50.8

Table 2. Distribution of type of delivery

Type of Delivery	n	%
Normal	37	58.7
LSCS	26	41.3

Type of delivery, LSCS has close relation with introduction of prelacteal feed mostly formula milk. LSCS is major barrier in exclusive breastfeeding. Percentage of normal delivery (58.7) correlates with percentage of exclusive breast feeding which is 52% in urban area.

Table 3. IYCF Practices: Prelacteal feed distribution

Prelacteal given	n	%
Yes	31	49.2
No	32	50.8

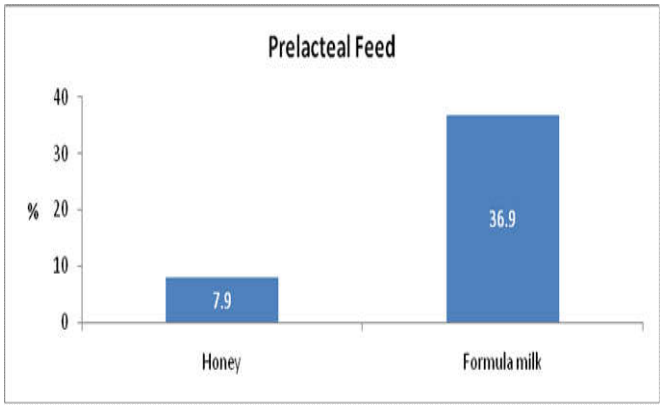

Figure 2. Distribution of type of prelacteal feed

Table 4. Distribution of time of initiation of breastfeeding after birth in children

Initiation of breastfeeding	n	%
Within 1 hour	28	44.4
Within 1 – 4 hours	16	25.4
Within 4 – 12 hours	3	4.8
After 24 hrs.	16	25.4

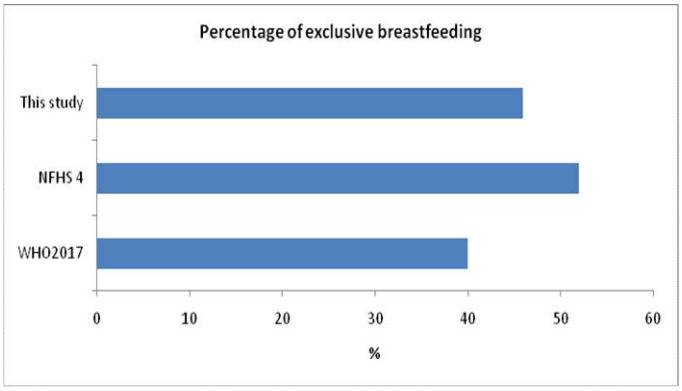

Figure 3. Exclusive Breast Feeding

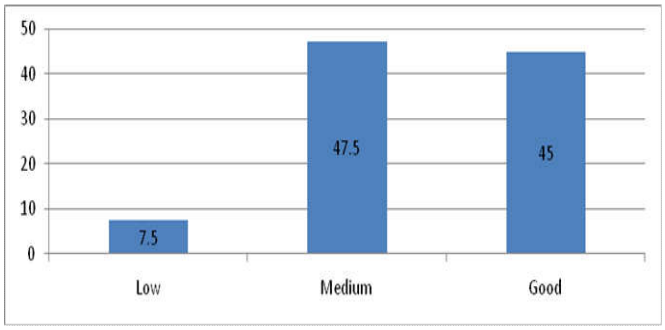

Figure 4. IFCI SCORE distribution among 6 to 24 months children

Table 5. Good IYCF practices in study group

Age of children	Feeding practices	n	%
0 to 24 months	Exclusive breastfeeding	29	46
6 to 24 months	IFCI score 6	18	45

Table 6. Anthropometric Assessment of Children of 0 to 24 months

Length for age	n	%
Normal	57	90.5
Stunted	4	6.3
Severe Stunting	2	3.2
Weight for Age	n	%
Normal	55	87.3
Underweight	5	7.9
Severe Underweight	1	1.6
Overweight	1	1.6
MUAC	N	%
MAM	7	11.1
Normal	52	82.5
Lenghth for Weight	N	%
Normal	56	87.3
Wasting	5	7.9
Severe Wasting	2	3.2

Introduction of prelacteal feed is a major barrier of exclusive breastfeeding. Percentage of exclusive breast feeding by NFHS 4 data is 52% and percentage of not giving prelacteal feed is 50.8% in this study. Honey is given by relatives and formula milk is suggested by medical staff as doctors and staff of hospital. Percentage of giving honey is 7.9% which is much lower than formula milk (36.9%). Early initiation is first component of IYCF practices. Breast crawl is advised in babies who have immediate cry, normal breathing just after delivery. When initiation is delayed, chances of giving prelacteal feeding are high. Percentage of early initiation within one hour is 44.4% and percentage of exclusive breastfeeding is 46% in this study. By NFHS 4 data 52.1% exclusively breastfed, this study shows 46% exclusively breastfed and WHO 2017-40% exclusively breastfed. IFCI sco re 4 and 5 graded as medium, 2 and 3 as low and 6 as good score. Low scoring children are 7.5%. Medium and good scoring children are 47.5% and 45% respectively. Odds of early initiation of breastfeeding was 15 times greater (OR =15.89, CI=3.39 to 74.58) in children delivered in government hospital, and that of exclusive breastfeeding was 7 times greater in children delivered in government hospital. Initiation of breastfeeding is significantly associated with introduction of prelacteal feed and exclusive breastfeeding ($p<0.02$). Type of delivery is found statistically significant with introduction of prelacteal feed, formula milk, early initiation and exclusive breastfeeding. Odds of exclusive breast feeding is 7 times high in normal delivered children.(OR= 7.75, CI= 2.37 to 25.38)

DISCUSSION

Nutrition is one of the important social determinants of health. In last few years, Maharashtra state had make significant progress in reducing maternal mortality and infant mortality. Nutritional status of population is reflected by Global Hunger Index. Three parameters are computed for global hunger index, these are proportion of underweight children, under five mortality and under nutrition in population. Maharashtra has poor rank in Indian state hunger index. In October 2017 report Maharashtra had rank of 100 which is very poor. Maharashtra is improving by different programs .MAA program focus on infant and young child feeding practices. Improper IYCF practices are causative of malnutrition. So to improve global hunger index improvement in nutritional status of children is important. Good IYCF practices help in reducing malnutrition. Sociodemographic characters play an important role in nutritional status of children according to study by Rajlakshmi in 2011.

Mother's age, education play important role in decision making. By NFHS-4 data women literacy is 81.4% which is less as compared to literacy rate of 92.1 of present study. Mother's age below 19 years is a causative factor for low birth weight and low birth weight can lead to malnutrition. Women married before 18 years is 17.4% by NFHS-4 data which differ from this study. In present study less than 19 years is 1.6% which is due to limitation of sample size. 92.1% mothers are unemployed which denote poor decision making.(1)23.8% from low income group in present study. Low income group is at risk for morbid conditions concluded in 2011 study by Rajlakshmi (Lakshman *et al*.). In present study single was home delivery attended by skilled health person, 41.3% private hospital deliveries and 57.1% delivered in government set up. Data of NFHS-4 shows 3% home deliveries, 46.2% in public facility.58.7%had normal delivery in this study and 41.3%delivered by Caesarean section.NFHS-4 shows urban population delivered in private health facility 44.8% and caesarean in government facility is 19.9%.Caesarean section in private facility is more than double than government facility.

A study in Delhi shows 90% institutional deliveries, 84.2% normal deliveries and 13.3% instrumental and Caesarean section (13). In this study 12.7% were low birth weight which is one of the cause of malnutrition but not found statistically significant. Prelacteal feed is common barrier for exclusive breast feeding. Honey is given by cultural beliefs. Formula milk is suggested by health workers as ANM, pediatricians and gynecologists. Prelacteal was given by 49.2%. in this study. Initiation within one hour after birth is an important indicator of IYCF practices.42.8% urban population of India-NFHS-4 started feeding within one hour after birth which is comparable with present study 44.4% and also with a study in Delhi which shows initiation of breastfeeding within 1 hour after birth 43.3%.(13,14). Exclusive breast feeding is another important indicator for good IYCF practices. In present study 46% were exclusively breast fed. A study in Delhi 51.3% was exclusively breastfed which is higher than this study. Normal delivery percentage is 90% that is related to high percentage of exclusive breastfeed (Pai *et al*., 1999). In this study 46% used homemade food.2.5% mothers were using watery food. Nutrient dense and semisolid complementary food is indicated by WHO.NFHS 4 data 2015-16 states that 48.8% urban in 6 to 8 months receive semisolid food. (Myatt *et al*.) this study 3% infants were bottle feed.Stunting was seen in 6.3% and 3.2% were severe stunted. In present study 7.9% children were underweight and 1.6% severe underweight and 1.6%was overweight. NFHS-4 data shows 29.3% stunted, 24.9% wasted, 9.5% severely wasted and 30.7% underweight. But this is data for children below 5 years of age. Most of the data is available for under three or under five and not for two years. 11.1% are MAM categorized in this study. A study in Mumbai by Neha Lohia *et al*. relates to this study as in that study also there was no significant difference between mean Z scores for WLZ, WAZ, LAZ and MUACZ in low and high categories. (Meshram *et al*., 2017).

Strengths of study

In this study assessment of both IYCF practices and nutritional status of children done. Total 63 mother child dyads were assessed. Mid upper arm circumference is measured 6 months onwards. In this study MUAC was measured in 0 to 24 months, 23 children in 0 to 6 months group and 40 in 6 to 24 months group .IFCI score was used as a single indicator of

IYCF practices which is useful in small studies. Limitations. This study carried out at Aundh Civil Hospital and it included children from mothers who are health conscious coming to the hospital for immunization. Sample size was not large enough when it came to finding the proportions for children's of different age groups and socioeconomic classes. Hence a small sample size and selection bias due to clinic based study is the limitations.

Conclusion

Mothers who delivered at government facility follow good IYCF practices as initiation within one hour, exclusive breast feeding for 6 months. Introduction of complementary feed at 6 months is followed by most of mothers irrespective of place of delivery. Babies delivered at private hospital have more chance to get formula milk contributing to a major barrier of breast feeding. IYCF practices at government hospital is followed as hospital staff, doctors get training of IYCF, MAA(Mother's Absolute Affection) and they implement this. ICFI score is not statistically significant with nutritional status of children. Exclusive breastfeeding up to 6 months is critical as compared to complementary feeding in 6 to 24 months age group. Place of delivery is decided by patient and relatives and type of delivery is decided by gynecologist. Irrespective of place of delivery and type of delivery, initiation of breastfeeding should be done as early as possible after birth.

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