



## “PREDICTORS OF MORBIDITY PROFILE AND FEEDING PRACTICES OF CHILDREN LESS THAN 24 MONTHS OF AGE: A COMMUNITY BASED STUDY IN A SLUM AREA OF KOLKATA”

### Community Medicine

\*Dr Bijit Biswas Junior Resident in Department of PSM, AIHH&PH, Kolkata. \* Corresponding Author

Dr Aparajita Dasgupta Director Professor and Head of the Department of P.S.M., AIHH&PH, Kolkata.

### ABSTRACT

**Background:** The feeding practices and illness during initial years of childhood are of critical importance for the growth and development of children.

**Objectives:** The current study was conducted to find out the predictors of morbidity profile and feeding practices of children less than 24 months of age.

**Methods:** The study was conducted from July-September 2016 among 124 children aged less than 24 months in a slum area of Kolkata.

**Results:** Only 66[53.2%] had satisfactory current feeding practices and whereas 60[48.4%] were suffering from any morbidity and under nutrition. In multivariable logistic regression child age, mothers educational level and per capita income were significantly associated with satisfactory current feeding practices whereas predictors of morbidity were birth order, mothers educational level, no colostrum feeding and unsatisfactory current feeding practices.

**Conclusion:** Current feeding practices of the study participants were not at all satisfactory, there was high burden of morbidity which requires intervention.

### KEYWORDS

feeding practices, morbidity profile, predictors, under nutrition

#### Introduction:

First 2 years of life is critical in terms of one's physical mental and social development. Optimal infant and young child feeding practices give a child best possible start of life. It not only ensures adequate nutrition but also boosts immunity thus helps in preventing various morbidities.<sup>[1,2]</sup>

A malnourished child is vulnerable to various morbidities which at times may have fatal outcome. High rates of infection have detrimental effect on a child's growth and development. It had been seen that an undernourished child may have cognitive impairment, growth retardation, and compromised educational achievement and less economically productive in later course of life. Worldwide, more than 170 million children do not have the opportunity to reach their full potential because of poor nutrition in the earliest months of their life.<sup>[3-5]</sup>

India is home for 112.8 million under 5 children of which 60 million are underweight. More than half of all deaths in young children are attributable to under nutrition.<sup>[1]</sup>

World Health Organization [WHO] and UNICEF have developed the global strategy for Infant and Young Child Feeding [IYCF] with recommendations of continued breastfeeding till 2 years with 6 months of exclusive breastfeeding, or feeding with appropriate iron-rich foods if not breastfed, feeding solid or semisolid food for a minimum number of times per day according to age and breastfeeding status and including foods from a minimum number of food groups per day according to breastfeeding status.<sup>[6]</sup>

It has been suggested that 20% of under-5 deaths could be prevented if all IYCF indicators are achieved<sup>[7]</sup> and ~22% of neonatal deaths could be averted with optimal breastfeeding.<sup>[8]</sup>

Most of the studies conducted in India have focused only on breastfeeding aspects but studies on dietary diversity and diet frequency aspects are scarce which are important for IYCF practices. Studies exploring relationship between morbidity and feeding practices are very few in number. With this background, this study was undertaken to assess the feeding practices and morbidity profile of children aged less than 24 months of age in a slum area of Chetla, Kolkata. The study will enable policymakers to design suitable interventions to improve the health status of children.

#### Materials and Methods:

It was an analytical observational community based study, cross-sectional in design, conducted for 3 months [July-September 2016] in

a slum area of Chetla, Kolkata among children aged less than 24 months of age. All children of stipulated age group were included in the study while those who were chronically ill or unwilling to participate were excluded.

Considering prevalence of early initiation of breastfeeding [under 3yrs of age] in West Bengal as 48.2% [NFHS 4[9] data] and allowable absolute error [precision] of 8% the minimum required sample size was 124 by applying the formula  $3.84 * p * q / L^2$ . All children aged less than 2 years in Chetla slum were line listed. Out of 361 eligible children the required number of children [i.e. 124] were selected by simple random sampling.

Pre-designed, pretested semi structured schedule was used for socio demographic, morbidity and IYCF related data collection. Standard weighing machine, WHO growth charts were used for anthropometric data. The schedule was adopted from the standard validated questionnaire framed by WHO [generic feeding questionnaire children 0-23months]<sup>[10]</sup>.

Data were collected by a pre-designed and pretested schedule after obtaining informed consent from mothers of the under-2years children. All feeding practices for children were elicited using 24 hour recall method. Historic recall was used for initiation of breast feeding and exclusive breastfeeding up to 6months. Feeding practices were assessed using eight core and optional feeding practice indicators.

#### Operational definitions used are listed next.

**Current feeding practices satisfactory-**Those who were receiving age appropriate breastfeeding, minimum acceptable diet, not bottle fed and consuming iron rich food in past 24 hours considered having satisfactory current feeding practices.

**Underweight-[mixed acute and chronic malnutrition]** is defined as Weight for Age Z-score [WAZ] of <-2.

**Morbidity-** It was measured according to the present health complaints of the child as reported by their mother.

**Ethical issues:** Informed written consent of the study participants was taken before conducting the study. During data collection, their confidentiality was assured.

Statistical Analysis Data were analysed using SPSS [version16].The strength of the associations was assessed by odds ratios [OR] at 95% confidence interval [CI].Multivariable logistic regression model was done for the variables found significant in univariate analysis. Model

fit was assessed by Hosmer Lemeshow test. Statistical significance for all analyses were set at  $p < 0.05$ .

**Results:**

The mean [SD] of the sample population was 10.9[6.4]. There was almost equal representation of both the sexes. Mean per capita income was Rs 2005.9 [SD-583.02] with most of them belonging to Socioeconomic class 3 and 4[87.1%]. [Modified BG Prasad Scale 2016] [Table 1]

**Table 1: Background characteristics of the study participants :**

n=124

| Variables                           | Frequency | Percentage[%] |
|-------------------------------------|-----------|---------------|
| <b>Age [in completed months]:</b>   |           |               |
| 0-5.9                               | 34        | 27.4          |
| 6-11.9                              | 38        | 30.6          |
| 12-17.9                             | 28        | 22.6          |
| 18-23.9                             | 24        | 19.4          |
| <b>Sex:</b>                         |           |               |
| Male                                | 58        | 46.8          |
| Female                              | 66        | 53.2          |
| <b>Religion:</b>                    |           |               |
| Hindu                               | 114       | 91.9          |
| Muslim                              | 10        | 8.1           |
| <b>Birth order:</b>                 |           |               |
| 1                                   | 65        | 52.4          |
| 2                                   | 37        | 29.8          |
| ≥3                                  | 22        | 17.7          |
| <b>Type of family:</b>              |           |               |
| Nuclear                             | 46        | 37.1          |
| Joint                               | 78        | 62.9          |
| <b>Educational level of mother:</b> |           |               |
| Illiterate                          | 15        | 12.1          |
| Below Secondary                     | 54        | 43.5          |
| Secondary and above                 | 55        | 44.4          |
| <b>Educational level of Father:</b> |           |               |
| Illiterate                          | 4         | 3.2           |
| Below Secondary                     | 54        | 43.5          |
| Secondary and above                 | 66        | 53.2          |
| <b>Fathers occupation:</b>          |           |               |
| Unskilled                           | 73        | 58.9          |
| Semiskilled                         | 48        | 37.7          |
| Skilled                             | 3         | 2.4           |
| <b>Mothers occupation:</b>          |           |               |
| Housewife                           | 119       | 96.0          |
| Working                             | 5         | 4.0           |
| <b>Socio-economic class:</b>        |           |               |
| Class 2                             | 13        | 10.5          |
| Class 3                             | 59        | 47.6          |
| Class 4                             | 49        | 39.5          |
| Class 5                             | 3         | 2.4           |
| <b>Type of delivery:</b>            |           |               |
| LSCS#                               | 51        | 41.1          |
| NVD##                               | 73        | 58.9          |
| # Lower Segment Caesarian Section   |           |               |
| ## Normal Vaginal Delivery          |           |               |

Table 2 depicts feeding practices of the study population. Current feeding practices were found out to be satisfactory in 66[53.2%] of the study participants. [Table 2]

**Table 2: Distribution of the study participants according to IYCF indicators:**

n=124

| Variables  | Frequency | Percentage |
|--|-----------|------------|
| <b>Core indicators:</b>                                |           |            |
| <b>1. Early initiation of breastfeeding[n=124]</b>     |           |            |
| Within 1 hour  | 42        | 33.9       |
| After 1 hour   | 82        | 66.1       |
| <b>2. Exclusive breastfeeding under 6 months[n=34]</b> |           |            |
| Yes  | 17        | 50.0       |
| No   | 17        | 50.0       |

|   |     |       |
|---|-----|-------|
| <b>3.Continued breastfeeding at 1 year [n=18]</b>               |     |       |
| Yes   | 17  | 94.4  |
| No  | 1   | 5.6   |
| <b>4.Introduction of solid, semi-solid or soft food[n=16]</b>   |     |       |
| Yes   | 9   | 56.2  |
| No  | 7   | 43.8  |
| <b>5.Minimum dietary diversity[n=90]</b>                        |     |       |
| Yes   | 56  | 62.2  |
| No  | 34  | 37.8  |
| <b>6.Minimum meal frequency[n=90]</b>                           |     |       |
| Yes   | 59  | 65.6  |
| No  | 31  | 35.4  |
| <b>7.Minimum acceptable diet[n=90]</b>                          |     |       |
| Yes   | 51  | 56.7  |
| No  | 39  | 43.3  |
| <b>8.Consumption of iron rich or iron fortified food [n=90]</b> |     |       |
| Yes   | 56  | 62.2  |
| No  | 34  | 37.8  |
| Optional indicators:  |     |       |
| <b>1.Children ever breastfed[n=124]</b>                         |     |       |
| Yes   | 124 | 100.0 |
| No  | 0   | 0.0   |
| <b>2.Continued breastfeeding at 2 years[n=18]</b>               |     |       |
| Yes   | 14  | 77.7  |
| No  | 4   | 22.3  |
| <b>3.Predominant breastfeeding under 6 months [n=34]</b>        |     |       |
| Yes   | 8   | 23.5  |
| No  | 26  | 76.5  |
| <b>4.Bottle feeding[n=124]</b>                                  |     |       |
| Yes   | 51  | 41.1  |
| No  | 73  | 58.9  |
| <b>5.Age appropriate breast feeding [0-5.9months] [n=34]</b>    |     |       |
| Yes   | 17  | 50.0  |
| No  | 17  | 50.0  |
| <b>6.Age appropriate breast feeding[6-23.9months] [n=90]</b>    |     |       |
| Yes   | 75  | 83.3  |
| No  | 15  | 16.7  |

In morbidity profile 60[48.4%] were morbid.38 [30.6%] were found out to be low weight for age [underweight] while 22[17.7%] were having ARI [Acute Respiratory Tract Infection]. [Table 3]

**Table 3: Morbidity profile of the study participants. n=124**

| Disease                             | Frequency* | Percentage |
|-------------------------------------|------------|------------|
| <b>ARI#</b>                         | 22         | 17.7%      |
| <b>Fever</b>                        | 12         | 9.7%       |
| <b>Skin infection</b>               | 8          | 6.4%       |
| <b>Diarrhoea</b>                    | 5          | 4.0%       |
| <b>Worm infestation</b>             | 2          | 1.6%       |
| <b>Conjunctivitis</b>               | 2          | 1.6%       |
| <b>Ear wax</b>                      | 1          | .8%        |
| <b>Jaundice</b>                     | 1          | .8%        |
| <b>Underweight</b>                  | 38         | 30.6%      |
| *multiple response                  |            |            |
| # Acute Respiratory Tract Infection |            |            |

Table 4 showed the association of various factors which were significantly predicting satisfactory current feeding practices. In multivariable model higher age [AOR-2.44[1.10-5.46], mothers educational level [AOR-2.48[1.11-5.58] and high per capita income [AOR-2.90[1.26-6.70] were significant adjusted with other significant variables in univariate analysis. In the model independent variables were explaining 29.8% variability of the dependent variable.

**Table 4: Univariate and Multivariable logistic regression model showing determinants of current feeding practices of children.**

n=124

| Characteristics                              | Current Feeding practices: Satisfactory n=66[53.2%] | OR[95%CI]       | AOR[95%CI]      |
|--|---|-----------------|-----------------|
| Childs age in months: [≥10 months]           | 41[62.1%]   | 2.17[1.05-4.44] | 2.44[1.10-5.46] |
| Sex:[Female]                                 | 37[56.1%]   | 1.28[0.63-2.59] | -               |
| Birth order:[<2]                             | 41[63.1%]   | 2.32[1.13-4.78] | 1.56[0.66-3.65] |
| Type of family:[Nuclear]                     | 25[54.3%]   | 1.07[0.52-2.31] | -               |
| Fathers educational level: [Above Secondary] | 36[54.5%]   | 1.12[0.55-2.27] | -               |
| Mothers educational level: [Above Secondary] | 38[69.1%]   | 3.27[1.55-6.91] | 2.48[1.11-5.58] |
| PCI <sup>#</sup> : [≥2000]                   | 48[66.7%]   | 3.79[1.78-8.02] | 2.90[1.26-6.70] |
| Type of delivery:[NVD]                       | 41[56.2%]   | 1.33[0.65-2.73] | -               |

# Per Capita Income

Table 5 showed the strength of association of various factors which were significantly associated with morbidity of the children. In multivariable model birth order [AOR-3.08[1.15-8.23], mothers educational level [AOR-2.78[1.18-6.34], no colostrum feeding [AOR-3.95[1.33-11.72] and unsatisfactory current feeding practices [AOR-3.16[1.28-7.82] were significant adjusted with other significant variables in univariate analysis. In the model independent variables were explaining 43.0% variability of the dependent variable.

**Table 5: Univariate and Multivariable logistic regression model showing determinants of morbidity of children:**

n=124

| Characteristics                              | Morbidity* Yes=60 [48.4%] | OR[95%CI]        | AOR[95%CI]       |
|--|---------------------------|------------------|------------------|
| Childs age in months: [<10 months]           | 29[50.0%]                 | 1.13[0.56-2.29]  | -                |
| Sex:[Male]                                   | 31[53.4%]                 | 1.47[0.72-2.98]  | -                |
| Birth order:[≥2]                             | 37[62.7%]                 | 3.07[1.48-6.39]  | 3.08[1.15-8.23]  |
| Type of family:[Nuclear]                     | 24[52.2%]                 | 1.27[0.61-2.64]  | -                |
| Fathers educational level: [Below Secondary] | 33[56.9%]                 | 1.91[0.93-3.90]  | -                |
| Mothers educational level: [Below Secondary] | 40[58.0%]                 | 2.41[1.17-5.00]  | 2.78[1.18-6.34]  |
| PCI <sup>#</sup> : [<2000]                   | 35[67.3%]                 | 3.87[1.82-8.24]  | 1.84[0.72-4.93]  |
| Type of delivery:[LSCS]                      | 27[53.4%]                 | 1.64[0.79-3.38]  | -                |
| Early initiation of Breastfeeding:[No]       | 49[59.8%]                 | 4.19[1.85-9.48]  | 1.20[0.36-3.98]  |
| Colostrum given:[No]                         | 40[67.8%]                 | 4.74[2.22-10.12] | 3.95[1.33-11.72] |
| Prelacteal feeding:[Yes]                     | 38[61.3%]                 | 2.88[1.39-5.97]  | 2.03[0.71-5.81]  |
| Current feeding practices: [Unsatisfactory]  | 40[69.0%]                 | 5.11[2.38-10.98] | 3.16[1.28-7.82]  |

\*Includes underweight  
# Per Capita Income

**Discussion:**

Early and timely initiation of breastfeeding is essential for a child's nutritional adequacy. Current study found out 33.9% of the study

participants had early initiation of breastfeeding under 6 months of age which was better than NFHS 3<sup>[11,12]</sup> but quite worse than NFHS 4.<sup>[9,13]</sup> Studies<sup>[14-16]</sup> had reported more while a community based study in Hubballi<sup>[17]</sup> reported less compared to our findings.

Exclusive breastfeeding up to 6 months of age is one of the important indicators of IYCF as it is beneficial for both mother and the child. The current study observed that 50% of the study population were exclusively breastfed under 6 months which was similar to NFHS 4.<sup>[9,13]</sup> Studies<sup>[14-16]</sup> had reported better results while the study in Hubballi<sup>[17]</sup> reported less compared to ours.

Timely initiation of complementary feeding enables a child to meet his/her nutritional needs and vital for his/her growth and development. In our study approximately half of the mothers of infants of 6-8.9 months of age timely initiated solid, semi-solid or soft foods which had similarities with NFHS 4.<sup>[9,13]</sup> Though there were studies<sup>[14,16]</sup> having concurrent and non-concurrent<sup>[17]</sup> findings compared to ours.

Dietary diversity relates to nutrient adequacy and diet variety, which are two of the main components of diet quality. In our study minimum dietary diversity was found in 62.2% of children aged 6-23 months which was similar to studies<sup>[15,16]</sup> but higher than the study conducted in East Delhi<sup>[14]</sup>.

Receiving the recommended minimum meal frequency plays a role in determining the nutritional status of the child. This critical window of opportunity ensures the child's appropriate growth and development. In our study minimum meal frequency was found in two-third of the children. It was more than the findings of studies<sup>[14,17]</sup> and less than that of NFHS 3<sup>[12]</sup> West Bengal [87.5%]. In our study 56.7% of children had minimum acceptable diet which was much higher than NFHS 4<sup>[9]</sup> and studies.<sup>[14-16]</sup>

The disadvantages of bottle feeding cannot be overlooked as baby is not only deprived from the immense benefits of breastfeeding but it imposes several health hazards [i.e. ARI] to the child. So bottle feeding should always be discouraged. In the present study 58.9% of children were bottle fed which was alarmingly high compared to studies.<sup>[14,16,17]</sup>

Colostrum contains many antibodies and growth factors in addition to the nutrients. The growth factors promote development of a baby's digestive system and the antibodies promote the immune system. In our study colostrum was given to only half of the study subjects similar to Hubballi<sup>[17]</sup> [47.3%] but others<sup>[14,15]</sup> had reported less. This variability of findings may be due to geographical plausibility.

An underweight child is more vulnerable to several morbidities. In our study 30.6% of the children were found to be underweight which was less compared to NFHS 3<sup>[12]</sup> data [38.7%], and studies<sup>[14,16]</sup> but similar to NFHS 4<sup>[9,13]</sup>.

The current study had reported that mother's education plays a vital role in her child feeding practices as with improvement of educational status their feeding counselling readiness also increases resulting in better feeding practices and vice versa. The findings were concurrent with findings of studies<sup>[17-19]</sup>. Unsatisfactory feeding practices results in reduced immunity thus increases morbidity. Paramanik D et al<sup>[20]</sup> had found out exclusive breastfeeding as a factor which determines morbidity. Studies conducted by Shamanewadi AN<sup>[21]</sup> and Shinde M et al<sup>[22]</sup> had found mothers education as an important determinant for morbidity similar to our findings.

Per capita income [PCI] status is also an important correlate of feeding practices as it determines affordability thus influencing morbidity too. In the present study PCI determined child current feeding practice and morbidity concurrent with findings of Shukla M et al<sup>[19]</sup> which identified it as determinant of feeding practice while Shamanewadi AN<sup>[21]</sup> and Gupta S et al<sup>[23]</sup> had found it as a predictor of morbidity.

Birth order emerged as an important predictor of feeding practices and morbidity of a child in our study. Gupta A<sup>[18]</sup> and Kakati R et al<sup>[24]</sup> identified birth order as a predictor of feeding practices while Singh NH et al<sup>[25]</sup> found birth order as a predictor of morbidity which were similar to our findings.

**Strengths:** It was a community based study which explored relation between feeding practices and morbidity in slum settings.

**Limitations of the study:** All the data were self-reported by the mother of the child which were not cross verified. So there may be under or over reporting due to social desirability bias. Environmental conditions [i.e. overcrowding] is one of the important determinant of childhood morbidity were not examined.

**Conclusion:** Feeding practices of children was not at all satisfactory. There was high burden of morbidity. Unsatisfactory feeding practices adds on to the burden. At every given opportunity health care providers should enquire to mothers of young child regarding their child feeding practices to identify and intervene at the earliest. Mother of the child should be counselled in easily comprehensible local language regarding benefits of optimum feeding practices in ensuring their child health.

## REFERENCES

1. WHO/ UNICEF. Global Strategy for Infant and Young Child Feeding 2003. [Last accessed on 2017 Jun 24]
2. Guidelines for Enhancing Optimal Infant and Young Child Feeding Practices. Ministry of Health and Family Welfare, Government of India., 2013. [Last accessed on 2017 Jun 24]
3. Oddy WH, Kendall GE, Blair E, De Klerk NH, Stanley FJ, Landau LI, et al. Breast feeding and cognitive development in childhood: a prospective birth cohort study. *Paediatr Perinat Epidemiol* 2003;17[1]:81-90.
4. Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B, et al. Developmental potential in the first 5 years for children in developing countries. *Lancet* 2007;369[9555]:60-70.
5. Victora CG, Adair L, Fall C, Hallal PC, Martorell R, Richter L, et al. Maternal and child undernutrition: consequences for adult health and human capital. *Lancet* 2008;371[9609]:340-57.
6. World Health Organisation[WHO]. Young Child Feeding Global Strategy for Infant and Young Child Feeding. Available from: <http://apps.who.int/iris/bitstream/10665/42590/1/9241562218.pdf> [Last accessed on 2017 Jun 25]
7. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. How many child deaths can we prevent this year? *Lancet* 2003;362[9377]:65-71.
8. Edmond KM, Kirkwood BR, Amenga-Etego S, Owusu-Agyei S, Hurt LS. Effect of early infant feeding practices on infection-specific neonatal mortality: an investigation of the causal links with observational data from rural Ghana. *Am J Clin Nutr* 2007;86[4]:1126-31.
9. NFHS-4. National Family Health Survey-4. State Fact Sheet West Bengal 2015-16. Available from: [http://rchiips.org/nfhs/factsheet\\_NFHS-4.shtml](http://rchiips.org/nfhs/factsheet_NFHS-4.shtml)
10. World Health Organization[WHO]. Indicators for assessing infant and young child feeding practices. [cited 2017 Jun 24]; Available from: [http://apps.who.int/iris/bitstream/10665/43895/1/9789241596664\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/43895/1/9789241596664_eng.pdf) [Last accessed on 2017 Jun 25]
11. National Family Health Survey [NFHS-3], 2005-06: India: Vol. 1. Mumbai: International Institute for Population Sciences and Macro International; 2007.
12. National Family Health Survey [Nfhs-3] India. 2005-06, West Bengal. Available from: <http://www.rchiips.org/nfhs/NFHS-3%20Data/wbstate report printed version. pdf>
13. International Institute for Population Sciences [IIPS]. National Family Health Survey 2015-16. Available at: [http://rchiips.org/NFHS/factsheet\\_NFHS-4.shtml](http://rchiips.org/NFHS/factsheet_NFHS-4.shtml)
14. Khan AM, Kayina P, Agrawal P, Gupta A, Kannan AP. A study on infant and young child feeding practices among mothers attending an urban health center in East Delhi. *Indian J Public Health* 2012;56[4]:301-4.
15. Davalgi S, Vidya GS. A study to know infant & young child feeding practices of mothers attending mother and child health clinic at a tertiary care teaching hospital, Davangere, India. *Int J Community Med Public Health*;22[4]:478-83.
16. Sarkar I, Dasgupta A, Das S, Sahoo SK, Shahbabu B. An Assessment Of Nutritional Status And Feeding Practices Among Children [Under 2years] In A Slum Of Kolkata. *Int J Heal Sci Res* 2015;5[6]:37-46.
17. Anjana P, Bant DD. Assessment of infant and young child feeding practices among UNDER-3 Years Children in Urban Slums of Hubballi City. *Int J Med Res Heal Sci* 2015;4[4]:763-7.
18. Gupta A, Chhabra P. Infant and young child feeding practices and its determinants in an urbanized village of Delhi. *Int J Med Public Heal*;5[3]:228-31.
19. Shukla M, Tyagi S, Agarwal M. Infant and young child feeding practices of mothers attending immunisation clinic at a tertiary care hospital of Lucknow. *International Archives of Integrated Medicine* 2016;3[1]:58-66.
20. Paramanik D, Datta S, Pal P, Chowdhury S, Murmu J, Nayek S. Assessment of Morbidity Profile of Under-Five Children in a Rural Area of West Bengal. *Indian J Hyg Public Heal* 2015;1[2]:35-40.
21. Shamanewadi AN, Nagaraj K. A Cross-sectional study on morbidity profile of children below 6 years in rural field practice area of KIMS. *Indian J Basic Appl Med Res* 2015;4[3]:577-83.
22. Shinde M, Joshi A, Trivedi A. Morbidity profile of preschool children in rural area of central Madhya Pradesh. *Int J Community Med Public Heal* 2015;2[3]:298-301.
23. Gupta S, Jamwal DS, Kumar D, Gupta SK. Morbidity among Under Five Children in a Rural Area of Jammu. *JK Sci* 2012;14[2]:85-8.
24. Kakati R, Baruah R, Barua K, Borah M. Infant and young child feeding practices and its determinants in rural areas of Kamrup district, Assam, India. *Int J Community Med Public Heal* 2016;33[88]:2119-24.
25. Singh HN, Devi HS, Singh YM. Study on Morbidity among Under-Five Children of A Rural Area of Manipur, Thanga: A Cross-Sectional Study. *J Evol Med Dent Sci* 2013;2[16]:2643-7.