

Original Research Article

# “FEEDING PRACTICES IN INFANT AND CHILDREN LESS THAN 2 YEARS AGE SUFFERING FROM DIARRHOEAL DISEASE IN BUNDELKHAND REGION OF MADHYA PRADESH”

Dr. Shalini Hajela<sup>1</sup> (Associate Professor), Dr. Anil Kumar Jain<sup>2</sup> (Assistant Professor), Dr. Tanya Mathrani<sup>3</sup> (Postgraduate Student), Dr. Ashish Jain<sup>4</sup> (Professor and HOD), Dr. Anuruddh Chaturvedi<sup>5</sup> (Postgraduate Student) & Dr. Shashwat Mati<sup>6</sup> (Postgraduate Student)

Department of Pediatrics, Bundelkhand Medical College, Sagar, MP.<sup>1,3,4,5&6</sup>  
Department of Biochemistry, Bundelkhand Medical College, Sagar, MP.<sup>2</sup>

Corresponding Author: Dr. Shalini Hajela

## ABSTRACT:

**INTRODUCTION:** Diarrhea is one of the leading causes of childhood mortality and accounts for nearly 9% of under-5 children deaths, as well as morbidity, under nutrition and stunting. There is an increasing evidence of association between feeding practices in childhood and the occurrence of childhood diarrhea. **METHODS:** A descriptive cross-sectional study was conducted on infants and children less than 2 years of age suffering from diarrhoeal diseases admitted in the Bundelkhand Medical College, Sagar, Madhya Pradesh. A total of 200 caregivers and mothers of children < 2 years of age were interviewed with the help of a predesigned questionnaire. **RESULTS:** Among 200 children who presented with diarrhea, most common age of presentation was 12-24 months (44.5%), with more males 61.5% and majority were from rural area 65.5%. During diarrhea, ORS was consumed by only 74% children. Khichdhi was the most common food consumed during diarrhea, by 21% children. In our study, 71% were exclusively breastfed. Mixed feeding (breastfeeding and top feeding) was provided to 58(29%) children before 6 months, among them maximum children were less than 2 months of age. Most common top milk given was cow milk given to 77.6% of children. Staple diet of this region among children was cereal –based diet (58.5%). Bottle feeding was given to 72.4% children.

**CONCLUSION:** In our study we had seen that there were different types of feeding practices among children who presented with diarrhea. So, we should focus on educating mothers about diarrhea illness, importance of fluids during diarrhea, knowledge regarding different feeding practices in children and hygienic practices to be followed by mother or caregivers.

**Key words:** Diarrhea, Exclusive breastfeeding, Top milk, Feeding practices, Complementary feeding, ORS.

## 1. INTRODUCTION

Diarrhea is a preventable and treatable disease. It is the second leading cause of death in under-five children. <sup>[1]</sup>Diarrhea alone accounts for overall 9% deaths of under-five children worldwide. <sup>[2]</sup> According to NFHS-5 data, prevalence of diarrhea in India is 9.3%. <sup>[3]</sup>WHO has defined diarrhea as passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). <sup>[1]</sup> Diarrhea is mainly caused due to contaminated food and poor hygienic source. It is usually an infection of intestine caused by many bacteria, viruses and other organisms. <sup>[1]</sup> Diarrheal illness, especially recurrent, prolonged or persistent, can be associated with malnutrition, stunting, and with micronutrient deficiencies. Environmental factors like improper sanitation, poor hygiene and poor-quality of water with socio-demographic factors like poverty, illiteracy are closely related with diarrhea.

It is crucial to know when, how and with what type of food a child should be fed, to lay the foundation for growth and development. <sup>[4]</sup> During first 2 years of life, a child must receive 6 months exclusive breastfeeding, followed by appropriate to his/her age complementary feeding along with continued breastfeeding. <sup>[4]</sup> A poorly nourished child is often sick, does not grow well and is least interested in surroundings.

Inappropriate feeding practices in infants and young children is also a risk factor for diarrhea. As there were very few studies done regarding the same, hence the study was conducted to assess the feeding practices in children less than 2yrs age suffering from diarrhea.

## 2. MATERIAL AND METHODOLOGY

**STUDY DESIGN:** This was a descriptive cross-sectional study for 1 year duration from 1<sup>st</sup>October 2021 to 30<sup>th</sup> September 2022 conducted at Bundelkhand Medical College, Sagar, M.P. All the patients of less than 2 years of age admitted with diarrhea were included. All patients whose parents did not give consent were excluded.

**Sample Size:** Sample size was calculated using the formula

$$= \frac{z^2(p*q)}{d^2}$$

Sample size of 150 cases was calculated and additional 50 cases were added to complete collection for 1 year, so that the prevalence can be calculated accurately.

- **STATISTICAL ANALYSIS:** Demographic variables were reported as counts and percentages. The collected data were entered into Microsoft Excel spreadsheet. SPSS software version 20 was used for analysis of the data. Appropriate statistical tests were applied.

## 3. METHODOLOGY:

A semi-structured questionnaire was provided to mothers, parents or guardians. The information regarding number of diarrhoeal episodes, feeding practices, time of complementary feed and duration of exclusive breastfeeding, continuation of breastfeeding, bottle feeding, use of ORS, hygiene and sanitary practices, socioeconomic and environmental factors etc was elicited. The questionnaire was filled by investigator in both illiterate and literate mothers to maintain the uniformity of data.

#### 4. RESULT:

A total of 200 mothers and caregivers of children <2 years of age were interviewed regarding different aspects of feeding and diarrhea according to a predesigned questionnaire.

Most common age group presented with diarrhea was 12-24 months observed in 89 (44.5%) children. 123 (61.5%) were males. 131 (65.5%) children were from rural area. 83 (41.5%) children belong to lower socio-economic status. 88 (44%) children had frequency of diarrhea > 8 times/day before hospitalization. Khichdi was the most common food provided during diarrhea, observed in 42 (21%) children we studied. Total 148 (54%) children were provided ORS. Mixed feeding was given to 58 (29%) children before 6 month of age. Prelacteals were given to 10 (5%) children. Washing with detergent and water was the most common method of cleaning bottle by 27 (64.3%) mothers. Most children 117 (58.5%) has a cereal based staple diet. Washed utensils were used by 196 (98%) mothers and hand washing was practiced by 196 (98%) mothers. 11 (5.5%) children were offered tea.

**Table 1- DEMOGRAPHIC DETAILS**

VARIABLES	FREQUENCY (N)	PERCENTAGE (%)
<b>AGE GROUP</b>		
0-6months	37	18.5%
6-12months	74	37%
12-24months	89	44.5%
<b>GENDER</b>		
Male	123	61.5%
Female	77	38.5%
<b>AREA</b>		
Rural	131	65.5%
Urban	69	34.5%
<b>SOCIO-ECONOMIC STATUS</b>		
Upper class		
Upper middle class	0	0
Lower middle	7	3.5%
Upper lower class	28	14%
Lower class	82	41%
	83	41.5%

**TABLE 2- FEEDING PRACTICES**

Breast feeding till 6month	Number of cases (n)	Percentage (%)
Yes	142	71%
No	58	29%
Total	200	100%
<b>Top milk</b>		
<2month	28	48.3%
2-4month	22	37.9%
4-6month	8	13.8%

Total	58	100%
<b>Type of top milk</b>		
Cow's milk	45	77.6%
Buffalo milk	1	1.7%
Goat milk	2	3.4%
Formula milk	7	12.1%
Package	3	5.2%

<b>Top milk given by</b>		
Katori spoon	15	25.9%
Paladi	1	1.7%
Bottle feed	42	72.4%
<b>Complementary feed started at age</b>		
6month-9month	108	66.3%
9month-12month	13	8%
>12month	10	6.1%
Total	163	100%
<b>Complementary diet started with</b>		
Dal water	82	50.3%
Rice water	15	9.2%
Fruit/vegetable puree	3	1.8%
Dalia	26	16%
Home based cereal diet	14	8.6%
<b>Food given during diarrhea</b>		
Dal water	41	20.5%
Curd	5	2.5%
Khichdi	42	21%
Banana	33	16.5%
<b>Staple diet</b>		
Cereal based homemade feed	117	58.5%
Package food product	3	1.5%
Others	43	26.3%

Most common age of introduction of top milk was < 2 months 28(48.3%). Cow milk was the most common top milk given to 45 (77.6%) children. Among top feed babies most common mode of administering top milk was bottle feeding in 42 (72.4%). 108 (66.3%) children out of 163 children were started complementary feed at the age of 6-9months. Most common complementary feed to start with was dal water observed in 82(50.3%) children.

142 (71%) children were “exclusively breastfed”, whereas 189(94.5%) children were “ever breastfed”.

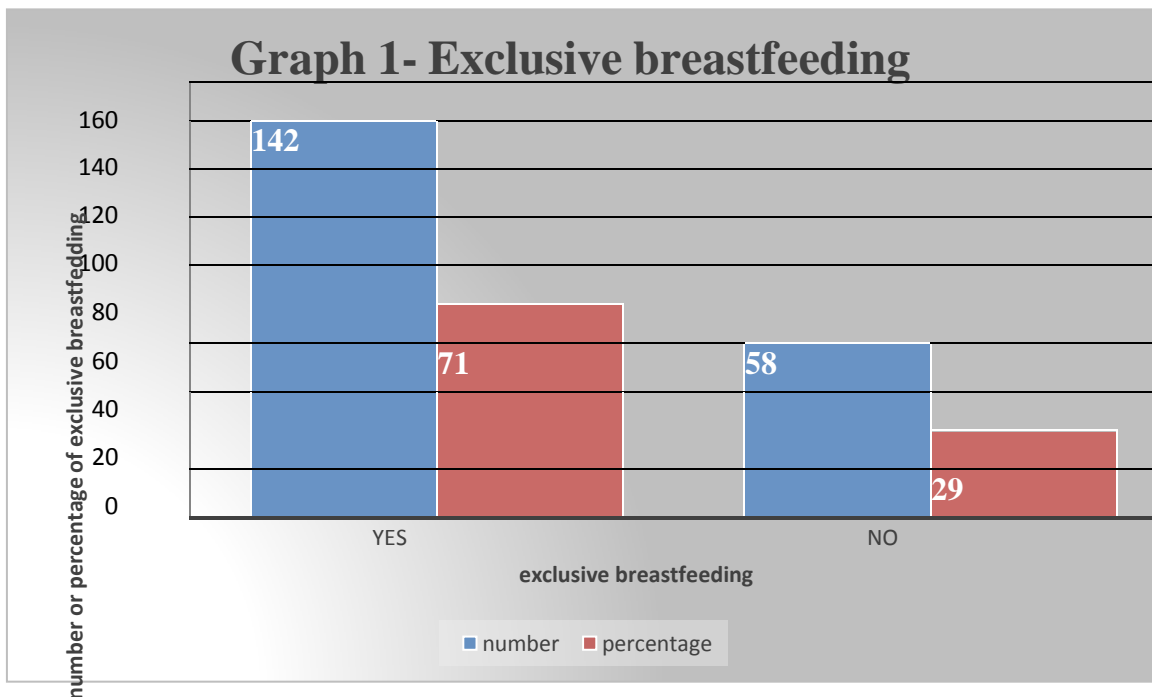


TABLE 3- TYPE OF ORAL FLUID GIVEN DURING DIARRHEA

Oral fluid	Number of cases(n)	Percentage (%)
Plain water only	43	21.5%
ORS only	65	32.5%
ORS & plain water	83	41.5%
Others	9	4.5%
Total	200	100%

Total 148 children (74%) out of 200 children were provided ORS. Out of 148 mothers’, 123(83%) mothers prepared ORS correctly. 144 (97.3%) children consumed ORS after each loose stools.

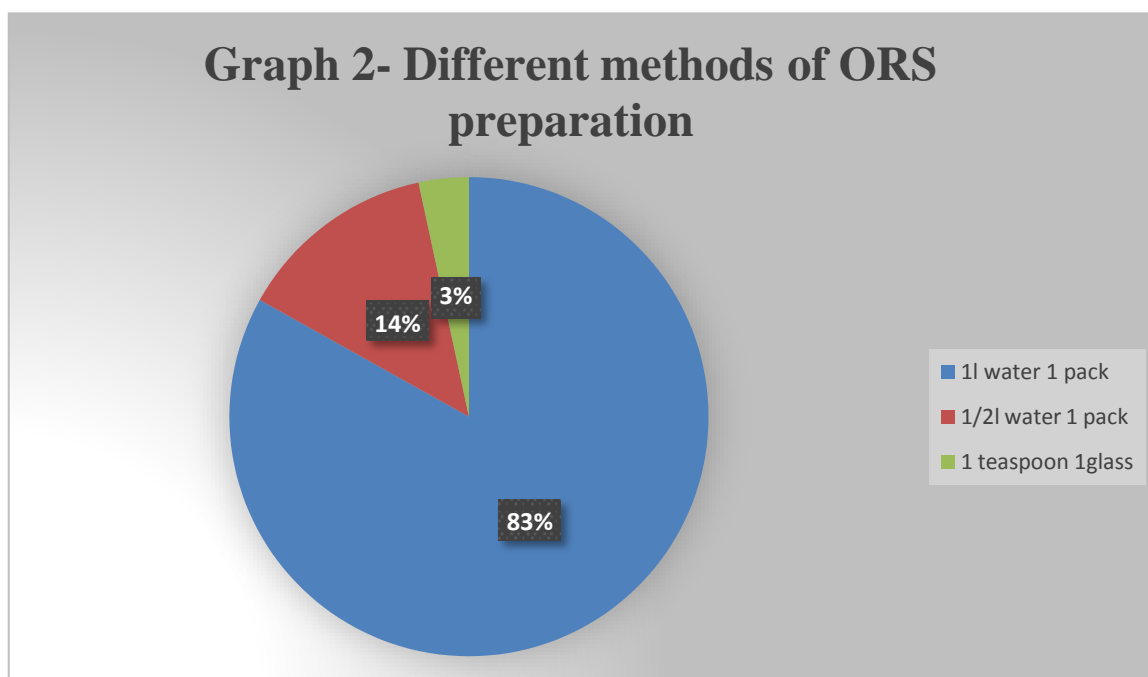


TABLE 4- SOURCE OF DRINKING WATER

Type of water used	Number of cases(n)	Percentage (%)
Tap water	158	79%
Well water	32	16%
River water	0	0
Others	10	5%
Total	200	100

In 158(79%) household's tap water was the common source of water.

## 5. DISCUSSION

Diarrhea is one of the most common childhood illnesses, with which a child presents to the outpatient clinic and hospital. The most common age group presented is under-five children, predominantly less than 2years age children.

Feeding has a very great role in everyone's life. During the first 2 years it is crucial, as it not only helps in growth and development but also helps to prevent future illness. Feeding and illness like diarrhea are interrelated as faulty feeding habits predispose to diarrhea and inter-current illnesses. Also diarrhea further predisposes to faulty absorption of nutrients and hampers appetite, worsening the vicious cycle.

In the present study, most children were of age 12-24 months. 123(61.5%) children were males and from rural area. Most children belongs to lower class and upper lower class 83(41.5%) and 82(41%) respectively. **Jay Saha et.al [2022]** similarly observed most children of age 12-23 months and from rural area commonly admitted with diarrhea.<sup>[5]</sup> Rural area, poor sanitation and weaning age children are more prone for diarrhea.

71% children were exclusively breastfed in our study. In contrast to our study, 56.7% children were exclusively breastfed for <6month in **Birte Patneburg et.al [2014]** study. <sup>[6]</sup> Exclusively breastfeeding promotes growth, prevents from serious diseases of childhood. 83% mothers could correctly prepare ORS in our study. In comparison, in a study done by **Naseem A et.al [2016]** only 69.5% mothers could correctly prepare ORS. <sup>[7]</sup>

5% mothers gave prelacteals to their children, whereas in a study done by **Anupam Parashar, Deepak Sharma et.al [2022]** on prelacteals, 49.8% mothers gave prelacteals to their children. <sup>[8]</sup> Prelacteals is an inadvertent type of feed. Top feed is one of the major contributing factors for diarrhea in children.

58 mothers started giving top milk before 6 months, out of whom 28 (48.2%) children, mothers started giving top milk before 2 months. In a study done by **Surendra Prasad Singh & Setu Sinha et.al [2014]** 34.4% children were weaned before 4 months. <sup>[9]</sup> Amongst top fed babies, 72.4% children were bottle fed, comprising 21% of all children. In a similar study by **Divya.S et al [2016]**, 74.8% children presented with diarrhea were bottle fed. <sup>[10]</sup>

It is crucial to initiate complementary feed timely to prevent from various childhood illnesses, malnutrition and non-communicable disease. 6-9 months was the most common age of introduction of complementary feed in 66.3% children in our study. In a study by **Priyanka A. Josh et.al.[2022]**, 91.6% children were started complementary feeding timely. <sup>[11]</sup> Dal water was the common weaning complementary feed introduced to 50.3% children. Khichdhi was the most common food consumed during diarrhea, by 21% children. In the study by **Kalaiselvi Selvaraj et. al [2021]**, most common complementary feed given was a cereal- based diet to 92.9% children. <sup>[12]</sup> Introduction of complementary feed depends on dietary diversity and regional differences.

The common source of most infections is through water we use to drink, our hands, objects utensils we use. In our study 98% mothers practiced hand washing and used washed utensils. **Divya. S et.al.[2016]** showed that up to 93.2% of mothers practiced hand washing after the use of the toilet and before cooking, which is close to our study. <sup>[10]</sup>

## 6. CONCLUSION:

The different feeding practices observed in babies admitted with diarrhea in Bundelkhand region of Madhya Pradesh were use of top milk before 6 months (29%), bottle feeding in 21% children (72.4% of the <6 months top feed babies), complementary feeding between 6-9 months in 66.3% children, prelacteal feeding (5%) etc.

The various socio-demographic factors related to diarrhea and feeding practices were age 12-24month, rural area, lower or upper lower socioeconomic status (Modified Kuppaswamy Scale), and hygienic factors such as, hand washing, clean washed utensils and others.

**Recommendations:** Exclusive breastfeeding and timely introduction of appropriate complementary feeding should be practiced for all children. The practice of top feeding (<6months), bottle feeding and prelacteals should be discouraged. Proper hygiene and sanitation should be emphasized.

**Author's Contribution:** SH: framing and revised article and help develop base of the study and in fine detailing. AKJ: Drafting the article, critical review. TM: Assemble and interpretation of data, data analysis, writing of the article, and literature review; AJ: Concept, literature review and revising the article critically for important intellectual content. AC and SM: writing the article and data collection. All the authors approved the final manuscript.



**Conflict of interest:** None

**Ethical Clearance:**

Institutional Ethical Committee, Bundelkhand Medical College, Sagar; approval Letter NumberIECBMC/2021/40, dated 07/10/2021.

## 7. BIBLIOGRAPHY

1. <https://www.who.int.Newsroom>, factsheet 2 May 2017.
2. UNICEF: Diarrhoea remains a leading killer of young children, despite the availability of a simple treatment solution. July 2022.
3. National Family Health Survey 5 Compendium of Fact Sheet 2019-2021. GOI MOHFW (Ministry of Health and Family Welfare).
4. UNICEF: Optimal feeding practices are fundamental to a child's survival, growth and development, but too few children benefit.
5. Saha, J.; Mondal, S.; Chouhan, P.; Hussain, M.; Yang, J.; Bibi, A. Occurrence of Diarrheal Disease among Under-Five Children and Associated Sociodemographic and Household Environmental Factors: An Investigation Based on National Family Health Survey-4 in Rural India. *Children* 2022, 9, 658. <https://doi.org/10.3390/children9050658>.
6. Birte Pantenburg,\* Theresa J. Ochoa, Lucie Ecker, and Joaquim Ruiz. Feeding of Young Children during Diarrhea: Caregivers' Intended Practices and Perceptions. Institute of Social Medicine, Occupational Health and Public Health, University of Leipzig, Leipzig, Germany; Instituto de Medicina Tropical Alexander von Humboldt, Universidad Peruana Cayetano Heredia, Lima, Peru; University of Texas School of Public Health, Houston, Texas; Instituto de Investigación Nutricional, Lima, Peru; Barcelona Centre for International Health Research (CRESIB, Hospital Clínic-Universitat de Barcelona), Barcelona, Spain. *Am. J. Trop. Med. Hyg.*, 91(3), 2014, pp. 555–562 doi:10.4269/ajtmh.13-0235.
7. Dr Altaf Naseem, & Dr Ravi Swetha. (2016). Knowledge attitude and practices of childhood diarrhea and ORS administration in diarrhea amongst mothers of children below age 5 years: A hospital based cross-sectional survey. *Pediatric Review: International Journal of Pediatric Research*, 3(6), 416-420. <https://doi.org/10.17511/ijpr.2016.i06.08>.
8. Parashar A, Sharma D, Gupta A, Dhadwal DS. Pre-lacteal feeding practices and associated factors in Himachal Pradesh. *Int J Health Allied Sci* 2017;6:30-4
9. Joshi PA, Joshi SH, Raut AV. "When," "What," and "How" of complementary feeding: A mixed methods cross-sectional study from a rural medical college in central India. *Arch Med Health Sci* 2019;7: 217-23.
10. Surendra Prasad Singh<sup>1</sup>, Setu Sinha<sup>2</sup>, Sanjay Kumar Choudhary<sup>3</sup>, Gautam Sarker<sup>4</sup>, Pankaj Kumar<sup>5</sup>, Kashif Shahnawaz<sup>6</sup>. DIARRHOEA AND ITS ASSOCIATION WITH THE TIME OF WEANING AND
11. DIETARY HABITS OF CHILDREN *Journal of Evolution of Medical and Dental Sciences* (2014) Vol. 3, Issue 40, September 01; Page: 10047-10052.
12. Divya S. 1 \*, C. R. Saju<sup>1</sup>, C. J. Navya<sup>1</sup>, Vidhu M. Joshy<sup>1</sup>, Jini M. P. 1, Radhamani M. V. 2. A study on selected behavioral factors of mothers influencing acute diarrhoea in under-five children in a rural part of Kerala, India. *International Journal of Community Medicine and Public Health* Divya S et al. *Int J Community Med Public Health*. 2016

- Aug;3(8):2211-2216 <http://www.ijcmph.com>
13. Joshi PA, Joshi SH, Raut AV. “When,” “What,” and “How” of complementary feeding: A mixed methods cross-sectional study from a rural medical college in central India. Arch Med Health Sci 2019;7:217-23.
  14. Selvaraj K, Stephen T, Priyadharshini SP, Radhakrishnan N, Ashic M, Research team. Exploration of dietary diversity and its associated factors among infant and young children in Rural Tamil Nadu – A mixed-method study. Indian J Public Health 2021;65:218-25.