

Maternal Knowledge and Practices in Diarrhoeal Management: A Cross-Sectional Study in Rural Uttar Pradesh, India

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ABSTRACT

Background:

Diarrhoeal disease remains a major contributor to morbidity and mortality among children under five years, particularly in rural and resource-limited settings. Timely home-based management using oral rehydration salts (ORS), zinc supplementation, continued feeding, and hygienic practices can significantly reduce diarrhoea-related deaths; however, caregiver-level gaps persist.

Objectives:

To assess the knowledge, attitudes, and practices (KAP) regarding diarrhoeal management among mothers of under-five children in rural Gautam Buddh Nagar, Uttar Pradesh, and to identify associated socio-demographic factors.

Methods:

A community-based cross-sectional study was conducted from 19–27 November 2022 in three randomly selected villages under the Rural Health Training Centre of Sharda University. A total of 223 mothers of under-five children were interviewed using a semi-structured questionnaire assessing KAP related to diarrhoea management. Data were analysed using SPSS version 20. Descriptive statistics were used, and associations were tested using the Chi-square test.

Results:

While 66.4% of mothers were aware of diarrhoea, only 37.2% knew its causes and 33.2% knew the correct preparation of ORS. Although 87.4% recognised exclusive breastfeeding as a preventive measure, awareness regarding vaccination (34.1%) and sanitation (45.3%) was limited. In practice, 41.7% of mothers used ORS and only 16.6% administered zinc during diarrhoeal episodes. Maternal education and socioeconomic status were significantly associated with better knowledge and practices ($p < 0.05$).

Conclusion:

Despite the availability of effective interventions, important gaps in maternal knowledge and practices persist. Strengthening community-based health education and improving ORS and zinc utilisation through frontline health workers are essential to reduce preventable diarrhoeal morbidity and mortality.

Key-words: Diarrhoea, under-five children, ORS, zinc, KAP, Rural India

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INTRODUCTION

Diarrhoea remains the third leading cause of death among children under five years globally. Nearly about 4.5 million children die annually due to diarrhoea. According to WHO “diarrhoea is defined as the passage of three or more loose or watery stools per day.” It can persist for several days and results in the loss of vital fluids and electrolytes needed for survival.¹

The high mortality and morbidity due to diarrhoeal diseases can be markedly reduced by Oral Rehydration Therapy, which includes proper home management with Home Available Fluids Oral Rehydration Salt solution (ORS) along with Zinc and by continuing usual feeding.²

According to NFHS V (National Family Health Survey) 61% Children with diarrhoea receive oral rehydration salts (ORS) (%) and 31% children with diarrhoea receive zinc.³

Primary prevention of diarrhoea in the form of Oral rehydration has not yet reached its full potential in preventing diarrhoea-related deaths, mainly due to factors like low socio-economic status, limited awareness among caregivers, and delays or failure in administering treatment when required.⁴

Recognizing the crucial role of mothers, family and care givers in managing diarrhoea, a joint WHO/UNICEF statement emphasized the importance of understanding their current attitudes, beliefs, and practices related to the illness.⁵

Hence, this study aims to assess the knowledge, attitudes, and practices related to diarrhoea management among mothers of children under five years residing in rural areas, and to identify factors linked to effective home-based care. It also seeks to raise awareness about proper management and recognition of danger signs in diarrhoea among young children.

METHODOLOGY

This community-based cross-sectional study was conducted in the rural areas of Gautam Buddh Nagar, falling within the catchment area of the Rural Health Training Centre (RHTC) of SMSR, Sharda University. The study population comprised mothers of children

under five years of age. Data were collected using an interviewer-administered semi-structured questionnaire over a period of seven days, from 19th to 27th November 2022. All mothers of under-five children were included in the study, while those who refused to give consent were excluded. The questionnaire assessed knowledge, attitude, and practices (KAP) related to diarrhoea management, each correct response was awarded 2 points; incorrect responses received zero. The maximum possible score was 15.”

Based on the scores, knowledge was categorized arbitrarily as good (8–10 points), average (6–8 points), or poor (0–4 points).

Sample Size

The sample size of the research was calculated as 223 using the formula - $N = Z^2 PQ / L^2$ where $P = 0.17$ from the previous literature,⁶ $Q = 0.83$ ($1-P$), $L = 0.05$ (Absolute error)

Sampling Method

Out of the eight villages in the rural area of Gautam Buddh Nagar, three villages—Patlakhaeda, Girdharpur, and Rouni—were randomly selected for the study. From each village, 79 samples were collected using convenient sampling by selecting a starting household and then proceeding to adjacent houses in a straight line towards the right until the required number was obtained.

Data Collection

Data were collected using an interviewer-administered semi-structured questionnaire through Google Forms. A list of villages was obtained from the medical social worker at the RHTC, Panchayatan, and three villages were selected for the study. House-to-house visits were conducted in the selected areas, and informed consent was obtained from the mothers of children under five years of age. These mothers were interviewed about their knowledge, attitudes, and practices (KAP) related to diarrhoea and its management during episodes. Interviews continued until the desired sample size was achieved.

Data Analysis

The collected data were entered into an MS Excel spreadsheet and analyzed using the Statistical Package for Social Sciences (SPSS), version 20. Descriptive statistics, including frequency and percentage distributions, were used to summarize the data. Additionally, the Chi-square test was applied to determine associations between various factors.

RESULTS

A total of 223 mothers were approached for the interview. The majority of the mothers in

the study were aged between 18 and 24 years (52%), followed by those aged 25 to 30 years (40.4%). The majority of participants were Hindu (72.6%) and resided in nuclear families (54.7%). A large proportion were homemakers (93.3%). In terms of socioeconomic status, over half (51.1%) belonged to the lower middle class, while 44.8% were from the middle class. Educational attainment was low, with 57.4% of mothers uneducated and only a small percentage (3.1%) being graduates. (Table 1)

TABLE 1-Socio-Demographic Profile of Study participants

Characteristics	Number (%)
1. Age Of Mother	
18 - 24	116 (52.0%)
25 - 30	90 (40.4%)
30 - 36	17 (7.6%)
2. Religion	
Hindu	162 (72.6%)
Muslim	61 (27.4%)
3.Type of family	
Joint	101 (45.3%)
Nuclear	122 (54.7%)
4. Occupation of mother	
Homemaker	208 (93.3%)
Skilled worker	10 (4.5%)
Unskilled worker	5 (2.2%)
5. Socioeconomic Status (MODIFIED BG PRASHAD)	
Middle class	100 (44.8%)
Lower middle class	114 (51.1%)
Lower class	9 (4.0%)
6. Education of mother	
Graduate	7 (3.2%)
Higher Secondary	9 (4.0%)

High school	70 (31.4%)
Elementary	9 (4.0%)
Uneducated	128 (57.4%)

In the study, 66.4% of mothers were aware of diarrhoea; however, only 37.2% had knowledge about its causes. While 41.7% were aware of the role of Oral Rehydration Salts (ORS) in managing diarrhoea, only 33.2%

knew the correct method of preparing it. Notably, 84.8% of the mothers did not hold any misconceptions regarding the use of ORS. (Table 2)

TABLE 2- Distribution of Study Participants as per Knowledge, Attitude and practices about Diarrhoea Management

MOTHER'S KNOWLEDGE	YES Frequency (%)	NO Frequency (%)
Aware about Diarrhoea	148 (66.4%)	75 (33.6%)
Aware about the Causes of diarrhoea	83 (37.2%)	140 (62.8%)
Aware of the role of ORS	93 (41.7%)	130 (58.3%)
Aware about correct method of giving ORS	74(33.2%)	149(66.8%)
Misconception of using ORS	34 (15.2%)	189(84.8%)
MOTHER'S ATTITUDE	YES Frequency (%)	NO Frequency (%)
Exclusive breastfeeding for 6 months useful in preventing diarrhoea	195 (87.4%)	28 (12.6%)
Vaccination necessary for preventing diarrhoea	76 (34.1%)	147 (65.9%)
Proper hand washing can prevent diarrhoea	138 (61.9%)	85 (38.1%)
Diarrhoea preventable and manageable at home	131 (58.7%)	92 (41.3%)
Open disposal of feces cause diarrhoea	101 (45.3%)	122 (54.7%)

MOTHER'S PRACTICES	YES Frequency (%)	NO Frequency (%)
Mother washes hands before cooking with soap and water	214 (96%)	9 (4.0%)
Child Exclusive breastfed for 6 months	129 (57.8%)	9 (42.2%)
Mother using ORS to manage diarrhoea	93 (41.7%)	130 (58.3%)
Use of Zn during diarrhoea	37 (16.6%)	186 (83.4%)
Proper disposal of waste	96 (43%)	127 (57.0%)

Table 3 shows that a large majority of mothers (87.4%) agreed that exclusive breastfeeding for the first six months helps prevent diarrhoea. However, only 34.1% believed that vaccination plays a role in its prevention. While 61.9% recognized the importance of proper

hand washing in preventing diarrhoea, 58.7% felt that it can be managed at home. Notably, only 45.3% of mothers acknowledged that open disposal of feces could be a cause of diarrhoea.

TABLE 3- Association of Maternal Knowledge and Practices on Diarrhoea Management with various Socio-demographic Factors

	Knowledge score Frequency (%)			Total	Chi square P value
	Poor	Average	Good		
Total	92 (41.2%)	66 (29.5%)	65 (29.1%)	223	
Socioeconomic Status (BG Prasad)					
III (Middle)	36 (36.0%)	36 (36.0%)	28 (28.0%)	100	15.76 0.003
IV (lower-middle)	47 (41.2%)	30 (26.3%)	37 (32.5%)	114	
V (Lower)	9 (100%)	0 (0%)	0 (0%)	9	
Education					
Graduate	1 (14.2%)	3 (42.8%)	3 (42.8%)	7	
Higher secondary	2 (22.2%)	2 (22.2%)	5 (55.5%)	9	16.54 0.035
High School	21 (30.0%)	27 (38.5%)	22 (31.4%)	70	
Others	7 (77.0%)	1 (11.1%)	1 (11.1%)	9	

Uneducated	61 (47.6%)	33 (25.7%)	34 (26.5%)	128	
	Practice score				
	Poor	Average	Good		
Education of mother					
Graduate	0 (0%)	2 (28.5%)	5 (71.4%)	7	
Higher secondary	0 (0%)	4 (44.4%)	5 (55.5%)	9	15.78
High School	0 (0%)	39 (55.7%)	31 (44.2%)	70	0.05
Elementary	0 (0%)	9 (100%)	0 (0%)	9	
Uneducated	7 (5.4%)	73 (57.0%)	48 (37.5%)	128	

The study found that 96% of mothers practiced handwashing with soap and water before cooking. Additionally, 57.8% reported exclusively breastfeeding their child for the first six months. However, only 41.7% used ORS during episodes of diarrhoea, and just 16.6% administered zinc as part of the treatment. Proper waste disposal practices were followed by 43% of the mothers. (Table 2). The study revealed a significant association between socioeconomic status and mothers' knowledge of diarrhoea management, with 100% of mothers from the lower class demonstrating poor knowledge, while 28% from the middle class and 32.5% from the lower middle class had good knowledge (Chi-square = 15.758, $p = 0.003$). A similar trend was observed with education levels; 42.8% of graduate mothers had good knowledge compared to only 26.5% among uneducated mothers, indicating a statistically significant relationship (Chi-square = 16.538, $p = 0.035$). Additionally, education was also significantly associated with diarrhoea management practices—71.4% of graduates exhibited good practices, whereas only 37.5% of uneducated mothers did, and poor practices were exclusively seen in the uneducated group (Chi-square = 15.78, $p = 0.046$). (Table 3)

Discussion

This community-based cross-sectional study

assessed the knowledge, attitudes, and practices (KAP) regarding diarrhoea management among mothers of under-five children in rural Gautam Buddha Nagar, Uttar Pradesh. Despite diarrhoea being one of the leading causes of under-five mortality in India and globally,⁷ the present study highlights considerable gaps in maternal awareness and practices that may impede effective control at the community level.

Knowledge Regarding Diarrhoea and ORS

In our study, although two-thirds of mothers were aware of diarrhoea, only one-third knew its causes and the correct preparation of ORS. These findings are comparable to studies from Maharashtra⁸ and Karnataka⁴, which reported similarly poor awareness regarding aetiology and ORS preparation. In contrast, studies from Tamil Nadu⁹ and Ethiopia¹⁰ reported relatively better awareness, suggesting regional variations in exposure to health information.

Attitudes towards Prevention and Management

Most mothers (87.4%) in our study recognized the preventive role of exclusive breastfeeding, consistent with earlier Indian findings^{11, 12}. However, awareness of vaccination (34.1%) and sanitation (45.3%) as preventive measures was low. Similar findings were reported in rural Odisha, where poor water, sanitation,

and hygiene (WASH) practices were significantly associated with higher prevalence of childhood diarrhoea¹³. Comparable gaps in hygiene-related knowledge were also observed in a study done by Kapoor N et al¹⁴, reflecting widespread misconceptions and low prioritization of preventive practices. These gaps underscore the urgent need for intensified health promotion campaigns, such as the Government of India's Intensified Diarrhoea Control Fortnight (IDCF).¹⁵

Practices Followed by Mothers

Our study found that 41.7% of mothers were aware of the role of ORS, and only 33.2% knew the correct preparation method and just 16.6% used zinc, despite WHO/UNICEF recommendations.⁵ As per the National Family Health Survey (NFHS-5), 2019-21 data the use of ORS packets for the treatment of diarrhoea varies widely across states/UTs, ranging from 45% in Goa to 88% in Dadra & Nagar Haveli and Daman & Diu. Urban children with diarrhoea are slightly more likely to receive ORS than rural children (63% vs 60%), and children from households in the lowest wealth quintile (67%) are less likely to receive any form of ORT compared to those in the highest wealth quintile (73%).¹⁶ A cross-sectional study done by Jain et al found that the prevalence of ORS treatment for child diarrhoea in India increased between 2016 and 2021, although the progress was uneven across and within its 720 districts. While earlier studies have attributed the know-do gap to individual attitudes and behaviours, these findings highlight the significant role of place-based factors, emphasizing the need for policies that account for contextual variations to improve ORS use.¹⁷ Another study done by Halli SS et al across India, shows that about 61% of children with diarrhoea received ORS and 31% received zinc supplementation; however, only around 24% were provided the recommended combination therapy of ORS and zinc.¹⁸ This underutilization is often attributed to non-availability, lack of awareness, inadequate training of caregivers and preference for home remedies and misuse of antibiotics.¹⁹

Socioeconomic and Educational Influences

Our study demonstrated significant associations between education, socioeconomic status, and maternal knowledge/practices. Educated mothers and those from middle-class families were more likely to demonstrate correct diarrhoea management, a finding corroborated by studies in RokkappanavarKK et al,⁴ Divasha et al⁶ and Datta V et al⁸. These findings emphasize the interlinkage between maternal education, empowerment, and child health outcomes.

Limitations of the Study

This study has being a cross-sectional study, captured information at a single point in time and therefore cannot establish causal relationships between maternal knowledge, attitudes, practices, and diarrhoeal outcomes. The use of convenience sampling may have introduced selection bias, as the sample may not be fully representative of the target population. Additionally, data were collected through self-reported responses, which are subject to recall bias and social desirability bias, particularly in reporting practices such as handwashing and ORS use.

Lastly, the study did not explore health system factors such as availability of ORS and zinc, access to healthcare services, or quality of health education, which could also significantly influence diarrhoea management practices.

CONCLUSION

This study evaluated the knowledge, attitude, and practices of diarrhoea management among mothers of under-five children in rural areas of Gautam Buddh Nagar, Uttar Pradesh. It found that only 41% of mothers were aware of the role of ORS, and just 33.2% knew the correct way to prepare it. Socio-economic status and education were key factors influencing their knowledge and practices, with both showing a significant association with effective diarrhoea management. Improving maternal awareness and practices through targeted health education interventions has the potential to significantly

reduce diarrhoeal morbidity and mortality among under-five children.

RECOMMENDATIONS

There is a need to enhance awareness among mothers about the critical role of ORS and zinc in reducing childhood mortality due to diarrhoea. Greater involvement of Anganwadi workers and ASHAs is essential in promoting home-based diarrhoea management practices. Systematic distribution of ORS packets, coupled with hands-on guidance on preparation, should be prioritized. Community-based demonstrations, such as live ORS preparation sessions, can further strengthen practical understanding and

retention of correct practices. Diarrhoea management education should also be integrated into routine maternal and child health visits to ensure continuous reinforcement of key messages. Mothers should be encouraged to ensure rotavirus vaccination and Vitamin A supplementation for their children, while adopting improved sanitation and hygiene practices. Furthermore, implementing innovative awareness activities and generating demand for preventive measures are key to fostering lasting behavior change and reducing preventable illness and death from diarrhoeal diseases.

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