

Original Article

Awareness and Practices Regarding Diarrhoeal Management Among Mothers of Under-Five Children: A Community-Based Cross-Sectional Study in Rural Gautam Buddh Nagar, Uttar Pradesh, India

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ABSTRACT

Background: Diarrhoeal disease remains a leading cause of morbidity and mortality among children under five years of age, particularly in rural and resource-limited settings. Timely home-based management with oral rehydration salts (ORS), zinc supplementation, continued feeding, and hygienic practices can prevent most diarrhoea-related deaths; however, gaps at the caregiver level persist. This study aimed to assess the knowledge, attitudes, and practices (KAP) regarding diarrhoeal management among mothers of under-five children in rural Gautam Buddh Nagar, Uttar Pradesh, India, and to identify associated socio-demographic factors.

Methods: A community-based cross-sectional study was conducted from 19 to 27 November 2022 in three randomly selected villages within the field practice area of the Rural Health Training Centre of Sharda University. A total of 223 mothers of under-five children were interviewed using a semi-structured, interviewer-administered questionnaire. Data were analysed using SPSS version 20; descriptive statistics were computed, and associations were tested using the chi-square test at a significance level of $p < 0.05$.

Results: Although 66.4% of mothers were aware of diarrhoea, only 37.2% knew its causes and 33.2% knew the correct method of preparing ORS. Most mothers (87.4%) recognised exclusive breastfeeding as a preventive measure, whereas awareness of vaccination (34.1%) and safe disposal of faeces (45.3%) was limited. Only 41.7% of mothers used ORS and 16.6% administered zinc during diarrhoeal episodes. Socioeconomic status ($p = 0.003$) and maternal education ($p = 0.035$) were significantly associated with

knowledge, and maternal education was associated with management practices ($p = 0.046$).

Conclusions: Substantial gaps persist in maternal knowledge and practices of diarrhoea management despite the availability of effective interventions. Strengthening community-based health education delivered by frontline health workers, with emphasis on correct ORS preparation and zinc use, is essential to reduce preventable diarrhoeal morbidity and mortality.

Keywords: *Diarrhoea; Under-five children; Oral rehydration salts; Zinc; Knowledge, attitudes and practices; Rural India.*

INTRODUCTION

Diarrhoeal disease is the third leading cause of death among children aged 1–59 months worldwide and accounts for approximately 443,832 deaths among children under five years of age every year.¹ The World Health Organization (WHO) defines diarrhoea as the passage of three or more loose or liquid stools per day, or more frequent passage than is normal for the individual. An episode may persist for several days and results in the loss of water and electrolytes that are essential for survival.¹

The high morbidity and mortality caused by diarrhoeal diseases can be markedly reduced through oral rehydration therapy, which comprises appropriate home management with recommended home-available fluids or oral rehydration salts (ORS) solution, together with zinc supplementation and continued feeding.² In India, however, the fifth National Family Health Survey (NFHS-5) reported that only 61% of children with diarrhoea received ORS and 31% received zinc.³

Oral rehydration therapy has not yet reached its full potential in preventing diarrhoea-related deaths, mainly because of low socioeconomic status, limited awareness among caregivers, and delay or failure in administering treatment when required.⁴ Recognising the crucial role of mothers, families, and caregivers in managing diarrhoea, the joint WHO/UNICEF statement on the clinical management of acute diarrhoea emphasised the importance of understanding their current attitudes, beliefs, and practices related to the illness.⁵ Nevertheless, community-based evidence on these aspects from rural areas of western Uttar Pradesh remains limited.

Therefore, this study aimed to assess the knowledge, attitudes, and practices (KAP) related to diarrhoea management among mothers of under-five children residing in rural Gautam Buddh Nagar, Uttar Pradesh, and to identify the socio-demographic factors associated with effective home-based care. The findings are expected to inform health education on the proper management of diarrhoea and the recognition of its danger signs in young children.

METHODS

1. Study Design and Setting

This community-based cross-sectional study was conducted in the rural areas of Gautam Buddh Nagar district, Uttar Pradesh, which fall within the field practice area of the Rural Health Training Centre (RHTC) of the School of Medical Sciences and Research (SMSR), Sharda University. Data were collected from 19 to 27 November 2022.

2. Study Population

The study population comprised mothers of children under five years of age residing in the selected villages. All eligible mothers who were available during the house-to-house visits were invited to participate, and those who refused to give consent were excluded.

3. Sample Size

The minimum sample size was calculated using the formula $n = Z^2pq/L^2$, where $Z = 1.96$ at a 95% confidence level, $p = 0.17$ based on a previous study,⁶ $q = 1 - p = 0.83$, and $L = 0.05$ (absolute precision). This yielded a minimum sample size of 217, and a total of 223 mothers were included in the study.

4. Sampling Technique

A list of villages was obtained from the medical social worker at the RHTC. Of the eight villages in the rural field practice area of Gautam Buddh Nagar, three villages (Patlakhaeda, Girdharpur, and Rouni) were selected by simple random sampling. In each village, a starting household was selected, and adjacent households were visited consecutively in a straight line towards the right until the required number of participants was reached.

5. Data Collection and Instrument

Data were collected through house-to-house visits using an interviewer-administered, semi-structured questionnaire entered directly into Google Forms. The questionnaire covered socio-demographic characteristics, including socioeconomic status assessed using the Modified BG Prasad Scale, as well as the knowledge, attitudes, and practices of mothers related to diarrhoea and its management during episodes. Interviews continued until the desired sample size was achieved.

Each correct response was assigned a score of 2, and each incorrect response was assigned a score of 0. Based on the total score, knowledge was arbitrarily categorised as good (8–10 points), average (6–8 points), or poor (0–4 points).

1. Ethical Considerations

Informed consent was obtained from all participating mothers prior to the interview, and confidentiality of the information was maintained throughout the study.

2. Data Analysis

The collected data were exported to a Microsoft Excel spreadsheet and analysed using the Statistical Package for the Social Sciences (SPSS) version 20. Descriptive statistics, including frequencies and percentages, were used to summarise the data. The chi-square test was applied to determine associations between socio-demographic variables and the knowledge and practice categories, with $p < 0.05$ considered statistically significant.

RESULTS

1. Socio-Demographic Characteristics of Participants

A total of 223 mothers were interviewed. The majority of mothers were aged between 18 and 24 years (52.0%), followed by those aged 25 to 30 years (40.4%). Most participants were Hindu (72.6%) and lived in nuclear families (54.7%), and a large proportion were homemakers (93.3%). In terms of socioeconomic status, more than half (51.1%) belonged to the lower-middle class, while 44.8% belonged to the middle class. With regard to education, more than half of the mothers (57.4%) had no formal education, and only 3.1% were graduates (Table 1).

Table 1. Socio-Demographic Characteristics of Study Participants (n = 223)

Characteristics	n	%
Age of mother (years)		
18–24	116	52.0
25–30	90	40.4
30–36	17	7.6
Religion		
Hindu	162	72.6
Muslim	61	27.4
Type of family		
Joint	101	45.3
Nuclear	122	54.7
Occupation of mother		
Homemaker	208	93.3
Skilled worker	10	4.5
Unskilled worker	5	2.2
Socioeconomic status (Modified BG Prasad Scale)		
Middle class	100	44.8
Lower-middle class	114	51.1
Lower class	9	4.0
Education of mother		
Graduate	7	3.1
Higher secondary	9	4.0
High school	70	31.4
Elementary	9	4.0
No formal education	128	57.4

Percentages may not total 100 due to rounding.

2. Knowledge, Attitudes, and Practices Regarding Diarrhoea Management

Overall, 66.4% of mothers were aware of diarrhoea; however, only 37.2% knew its causes. While 41.7% were aware of the role of ORS in managing diarrhoea, only 33.2% knew the correct method of preparing it. Notably, 84.8% of mothers did not hold any misconceptions regarding the use of ORS (Table 2).

With regard to attitudes, a large majority of mothers (87.4%) agreed that exclusive breastfeeding for the first six months helps to prevent diarrhoea (Table 2). However, only 34.1% believed that vaccination plays a role in its prevention. While 61.9% recognised the importance of proper handwashing in preventing diarrhoea, 58.7% believed that diarrhoea is preventable and can be managed at home. Only 45.3% of mothers acknowledged that open disposal of faeces could cause diarrhoea.

Regarding practices, 96.0% of mothers washed their hands with soap and water before cooking, and 57.8% reported exclusively breastfeeding their child for the first six months. However, only 41.7% used ORS during episodes of diarrhoea, and only 16.6% administered zinc as part of the treatment. Proper waste disposal was practised by 43.0% of the mothers (Table 2).

Table 2. Distribution of Mothers According to Knowledge, Attitudes, and Practices Regarding Diarrhoea Management (n = 223)

Item	Yes n (%)	No n (%)
Knowledge		
Aware of diarrhoea	148 (66.4)	75 (33.6)
Aware of the causes of diarrhoea	83 (37.2)	140 (62.8)
Aware of the role of ORS	93 (41.7)	130 (58.3)
Knows the correct method of preparing ORS	74 (33.2)	149 (66.8)
Holds misconceptions about the use of ORS	34 (15.2)	189 (84.8)
Attitudes		
Exclusive breastfeeding for six months helps prevent diarrhoea	195 (87.4)	28 (12.6)
Vaccination is necessary to prevent diarrhoea	76 (34.1)	147 (65.9)
Proper handwashing can prevent diarrhoea	138 (61.9)	85 (38.1)
Diarrhoea is preventable and manageable at home	131 (58.7)	92 (41.3)
Open disposal of faeces causes diarrhoea	101 (45.3)	122 (54.7)
Practices		
Washes hands with soap and water before cooking	214 (96.0)	9 (4.0)
Child exclusively breastfed for six months	129 (57.8)	94 (42.2)
Uses ORS to manage diarrhoea	93 (41.7)	130 (58.3)
Gives zinc during diarrhoea	37 (16.6)	186 (83.4)
Disposes of waste properly	96 (43.0)	127 (57.0)

ORS = oral rehydration salts.

3. Factors Associated with Knowledge and Practices

A significant association was found between socioeconomic status and mothers' knowledge of diarrhoea management. All mothers from the lower class (100%) had poor knowledge, whereas 28.0% of mothers from the middle class and 32.5% from the lower-middle class had good knowledge ($\chi^2 = 15.758$, $p = 0.003$). A similar trend was observed for education: 42.9% of

graduate mothers had good knowledge compared with only 26.6% of mothers with no formal education ($\chi^2 = 16.538$, $p = 0.035$). Maternal education was also significantly associated with diarrhoea management practices; 71.4% of graduate mothers demonstrated good practices compared with 37.5% of mothers with no formal education, and poor practices were observed exclusively in the latter group ($\chi^2 = 15.788$, $p = 0.046$) (Table 3).

Table 3. Association of Mothers' Knowledge and Practice Scores Regarding Diarrhoea Management with Socio-Demographic Variables

Variable	Poor n (%)	Average n (%)	Good n (%)	Total n	χ^2	p-value
A. Knowledge score						
Total	92 (41.3)	66 (29.6)	65 (29.1)	223		
Socioeconomic status (Modified BG Prasad Scale)					15.758	0.003*
III (Middle)	36 (36.0)	36 (36.0)	28 (28.0)	100		
IV (Lower-middle)	47 (41.2)	30 (26.3)	37 (32.5)	114		
V (Lower)	9 (100.0)	0 (0.0)	0 (0.0)	9		
Education of mother					16.538	0.035*
Graduate	1 (14.3)	3 (42.9)	3 (42.9)	7		
Higher secondary	2 (22.2)	2 (22.2)	5 (55.6)	9		
High school	21 (30.0)	27 (38.6)	22 (31.4)	70		
Elementary	7 (77.8)	1 (11.1)	1 (11.1)	9		
No formal education	61 (47.7)	33 (25.8)	34 (26.6)	128		
B. Practice score						
Total	7 (3.1)	127 (57.0)	89 (39.9)	223		
Education of mother					15.788	0.046*
Graduate	0 (0.0)	2 (28.6)	5 (71.4)	7		
Higher secondary	0 (0.0)	4 (44.4)	5 (55.6)	9		
High school	0 (0.0)	39 (55.7)	31 (44.3)	70		
Elementary	0 (0.0)	9 (100.0)	0 (0.0)	9		
No formal education	7 (5.5)	73 (57.0)	48 (37.5)	128		

Percentages are row percentages. χ^2 = Pearson chi-square test; *p < 0.05.

DISCUSSION

This community-based cross-sectional study assessed the knowledge, attitudes, and practices regarding diarrhoea management among mothers of under-five children in rural Gautam Buddh Nagar, Uttar Pradesh. Although diarrhoea remains 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 of diarrhoeal disease at the community level.

1. Knowledge Regarding Diarrhoea and ORS

In the present study, although two-thirds of mothers were aware of diarrhoea, only about one-third knew its causes and the correct method of preparing ORS. These findings are comparable to those of studies from Maharashtra⁸ and Karnataka,⁴ which reported similarly poor awareness of the aetiology of diarrhoea and of ORS preparation. In contrast, studies from Tamil Nadu⁹ and Ethiopia¹⁰ reported relatively better awareness,

suggesting regional variation in exposure to health information. Incorrect preparation of ORS may reduce its effectiveness or even be harmful; therefore, practical demonstration of ORS preparation should be an integral part of health education sessions.

2. Attitudes towards Prevention and Management

Most mothers (87.4%) in this study recognised the preventive role of exclusive breastfeeding, which is 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 a higher prevalence of childhood diarrhoea.¹³ Comparable gaps in hygiene-related knowledge were also observed by Kapoor et al.,¹⁴ reflecting widespread misconceptions and the low priority given to preventive practices. These gaps underscore the need for intensified health promotion campaigns, such as the Government of India's Intensified Diarrhoea Control Fortnight (IDCF).¹⁵

3. Practices Followed by Mothers

In this study, only 41.7% of mothers used ORS during diarrhoeal episodes, and only 16.6% used zinc, despite the WHO/UNICEF recommendations.⁵ Similarly low use of ORS has been reported by Gogoi and Chamuah in Assam (21.2%)¹⁶ and by Shaw et al. in Malaysia (30%).¹⁷ A national analysis of NFHS data by Halli et al. showed that about 61% of children with diarrhoea received ORS and 31% received zinc supplementation; however, only around 24% received the recommended combination of ORS and zinc.¹⁸ This underutilisation is often attributed to non-availability, lack of awareness, inadequate training of caregivers, preference for home remedies, and misuse of antibiotics.¹⁹ The particularly low use of zinc in the present study indicates that the combined ORS–zinc regimen has not yet been adequately promoted at the household level.

4. Socioeconomic and Educational Influences

This study demonstrated significant associations of maternal education and socioeconomic status with maternal knowledge and practices. Educated mothers and those from middle-class families were more likely to demonstrate correct diarrhoea management, a finding corroborated by the studies of Rokkappanavar et al.,⁴ Divasha et al.,⁶ and Datta et al.⁸ These findings emphasise the interlinkage between maternal education, empowerment, and child health outcomes, and suggest that health education should be tailored to the needs of mothers with little or no formal education.

5. Strengths and Limitations

The strengths of this study include its community-based design and house-to-house data collection, which captured mothers who might not otherwise access health facilities. However, several limitations should be acknowledged. First, the cross-sectional design does not allow causal inferences to be drawn. Second, practices were self-reported and may be subject to recall and social desirability bias. Third, households within the villages were selected consecutively rather than randomly, which may limit the generalisability of the findings. Finally, some socio-demographic categories contained small numbers of participants, and the associations were examined using bivariate analysis without adjustment for potential confounders.

CONCLUSIONS

This study found substantial gaps in the knowledge and practices of diarrhoea management among mothers of under-five children in rural Gautam Buddh Nagar, Uttar Pradesh. Only 41.7% of mothers were aware of the role of ORS, only 33.2% knew how to prepare it correctly, and only 16.6% used zinc during diarrhoeal episodes. Socioeconomic status and maternal education were significantly associated

with knowledge, and education was significantly associated with management practices.

Awareness among mothers about the critical role of ORS and zinc in reducing childhood mortality due to diarrhoea needs to be enhanced. Greater involvement of Anganwadi workers and Accredited Social Health Activists (ASHAs) is essential to promote home-based diarrhoea management, including increased distribution of ORS and zinc to households with under-five children, accompanied by practical guidance on their preparation and use. Mothers should also be encouraged to ensure rotavirus vaccination and vitamin A supplementation for their children and to adopt improved sanitation and hygiene practices. Innovative behaviour change communication activities that generate demand for these preventive measures are key to reducing preventable illness and death from diarrhoeal diseases.

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CONFLICT OF INTEREST AND FUNDING

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