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RESEARCH ARTICLE
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IMPACT OF MATERNAL KNOWLEDGE AND PRACTICES ON DIARRHEAL DISEASE PREVENTION IN RURAL UDAIPUR

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Introduction

Diarrhea and waterborne diseases are major contributors to mortality and illness in developing nations.[1] Among children aged 1–59 months, diarrheal disease is the third leading cause of death. Although it is preventable and treatable, diarrhea still claims the lives of approximately 443,832 children under 5 years old and an additional 50,851 children aged 5 to 9 years annually. A large portion of these cases could be avoided with access to clean drinking water, proper sanitation, and hygiene practices. Globally, nearly 1.7 billion cases of childhood diarrheal disease occur each year, and it is a leading cause of malnutrition among children under 5.[2] Despite the availability of simple treatments, diarrhea continues to be a significant cause of death among young children, accounting for around 9 percent of all under-5 child deaths worldwide in 2021.[3] Exclusive breastfeeding plays a protective role by preventing diarrhea in infants and reducing its severity. Infants between 3 to 6 months are particularly vulnerable, with diarrhea being the most common infection seen between 3 and 33 months.[4]

Accelerating efforts to reduce childhood mortality is one of the key objectives of the Millennium Development Goals and the National Health Mission (India). Diarrhea is a major cause of under-five mortality and a large proportion of these deaths occur during the summer and monsoon seasons. So, to address this issue effectively, the Ministry of Health & Family Welfare, India UNICEF partnered together to launch a nationwide project; the Intensified Diarrhea Control Fortnight (IDCF). This campaign is held annually from 28th July to 8th August 2014 and aims to achieve ‘zero child deaths due to childhood diarrhea.’ The IDCF aims to improve the coverage of essential lifesaving interventions including ORS, zinc dispersible tablets, and the promotion of appropriate child-feeding practices during episodes of diarrhea.[5]

Other studies have also found that mothers' age, the age of the child, social class, religious residence, and wealth index affect childhood diarrhea in India.[6,7,8] People with low formal education, low earning income, and poor living standards suffer from recurrent ill health. Basic facilities such as safe and pure drinking water are not available even. Another prevalent lack of knowledge is the benefits of

hand washing, keeping clean, and how to dispose of fecal matter. Such circumstances can result in the emergence of deadly diseases that are major causes of death in children. [9]

Mother plays an essential role in feeding and taking care of their children in any environment under any resource; even pinpointing the dehydration symptoms, the quantity and the type of liquid fed into the body is pivotal to pediatric survival. The study also highlighted the need for innovative activities and demand creation for behavior change interventions to achieve and sustain long-term preventive practices to reduce morbidity and mortality from diarrheal disease.

Objectives

This study aimed to identify gaps in knowledge about the causative factors, signs, symptoms, prevention, and control of diarrheal disease among caregivers of children under 5 years old.
The study also sought to determine attitudes and practices among these caregivers to determine environmental and behavioral risk factors for diarrhea. The interactions that inexplicably reduce or enhance these impacts warrant understanding to develop effective preventive strategies.

Materials and methods

This study was conducted at the rural health training center (RHTC) of our medical college, American International Institute, Bedwas Village in Udaipur district. Sakroda village is home to the RHTC itself. The Udaipur municipal council has a population of 451,000 with 47,932 children of 0-6 years of age constituting 10.63% of the total population. Udaipur City has a literacy rate of 89.66%, higher than the state average of 66.11%. Scheduled Caste (SC) population is 10.49% and Scheduled Tribe (ST) population is 5.02% of the total population.[10]

Study area

A cross-sectional study was conducted in the populations of villages under RHTC i.e. Bhalo ka Guda, Bedka, Karkagt, Sakroda, and Bedwasfromg July to October 2023.

Sample Size

A pilot testing of the questionnaire was done among the households of the tribal population in the Udaipur district to calculate the sample size. The study area had 53% of children who had experienced one episode of diarrhea in the past five years. The sample size was calculated using the formula $n = 4PQ/d^2$, where P is the prevalence, Q = 100 – P, and d is the permissible error (taken as 15% of P).[7] The calculated sample size was 157. The final sample size was subsequently determined to be 160 after rounding up to the nearest whole number (denoted 'N' in the results).

Development of questionnaire: -

1. The mothers of children under five years old in Sakroda village and the nearby villages (Bhalo Ka Guda, Bedka, Karkagt, and Bedwas) were involved in pretesting the questionnaire to ensure its relevance and comprehensibility. Local health workers were trained to administer the questionnaire and accurately collect the data. Face-to-face interviews were conducted with informed consent from each participant.
2. Thoroughly did a review of the existing literature on the KAP study of diarrhea prevention and control. Knowledge, attitudes, and practices related to the prevention and management of diarrhea are important to prevent and manage diarrheal. Relevant questions were developed from previously validated questionnaires used in similar studies. Public health experts, pediatricians, and local healthcare workers all collaborated to make sure the questionnaire was comprehensive and also contextually relevant.
3. Create a semi-structured questionnaire with sections on knowledge, attitude, e, and practices. The multiple-choice questions included – simple and local language considering the literacy levels of the target population. The draft questionnaire was administered to the selected households through face-to-face interviews by trained local health workers. Feedback was collected from both participants and

interviewers on the clarity, relevance, and comprehensiveness of the questions. The questionnaire was then finalized after incorporating all necessary revisions, ensuring it effectively addresses all key areas identified through the literature review and expert consultations.

Sampling technique: A systematic random sampling method was used to select the 160 participants from this population. Local health records were used to compile a comprehensive list of all households with children under 5 years in the study area. The selection interval was calculated by dividing the total number of eligible households (1600) by the desired sample size (160) which gave a selection interval of 10. A random number between 1 and 10 was selected to choose a random starting point within the first interval. From this random point, every 10th household was selected until the sample size of 160 was reached.

Inclusion criteria

Mothers of children under 5 years old who met the following criteria were included in the study.

1. **Residency:** The mother must have been residing in the study area (Sakroda village and nearby villages: For more than one year (Bhalo ka Guda, Bedka, Karkagt, and Bedwas).
2. **Willingness to participate**: Mothers who are willing to participate in the study.
3. **Child Age:** Mothers who were willing to participate in the study.
4. **Recent Diarrheal episode:** Mothers whose children had at least one episode of diarrhea in the previous two months.

Exclusion criteria

Mothers who did not meet the above criteria were excluded from the study.

Data was collected and entered into Microsoft Excel 2010 and analyzed. Percentages were expressed as frequencies. The questions were multiple choice, so participants could choose more than one option in the same question.

	Number of participants (N=160)	**Percentage**
Age Group		
15-20	2	1.25%
21-25	95	59.37%
26-30	55	34.37%
30-35	87	4.37%
>35	1	1.25%
Type of Family		
Nuclear family	77	48.125%
Joint family	83	51.87%
Education of mother		
Illiterate	98	61.25%
Primary	30	18.75%
Secondary	24	15.00%
Pre-university course	5	3.125%
Degree	3	1.875%
Occupation of mother		
Government employee	4	2.5%
Farmer	21	13.125%
Labor	48	30%
Housewife	67	41.87%
Caste		
SC	18	17.25%
ST	76	47.5%
OBC	22	13.75%
General	34	21.25%

Table: 1 Demographic characteristics of the study population

Table: 2 Knowledge of the mother regarding causes and prevention of diarrhea and signs and symptoms of dehydration

Causes of diarrhoea	**(N=160)**	**Percentage**
Contaminated water and fluid	112	70%
Teething	100	62.5%
Overeating	36	22.5%
Unhygienic surroundings	76	47.5%
Incomplete immunization	56	35%
Bottle feeding	47	29.37%
Worm infestation	18	11.25%
Malnutrition	23	14.37%
Don’t know	11	6.87%
Prevention of diarrhoea		
Drinking clean water	132	82%
Hand washing with soap	142	88.7%
Eating fresh, clean, cooked food	115	71.87%
Keeping surrounding cleans	86	53.75%
Use of latrine	56	35.75%
Sterilizing milk bottle	77	48.12%
BBreastfeeding	98	61.25%
Don't know	15	15.95%
Complete the course of immunization	68	42.5%
Signs and symptoms of dehydration		
Lethargy	89	55.6%
Irritability	127	79.37%
Sunken eyes	49	30.62%
Dry lips and tongue	58	36.25%
Low output of urine	38	23.75%
Decrease elasticity of skin	23	14.37%
Don't know	38	23.75%

Multiple responses are given by the mother

Table: 3 Attitude of mothers towards preventive and management of diarrhea of the under 5 children*

Washinhandsnd with soap after defecation and handling	115	71.87%
Drinking clean water	132	82.5%
Disposal of child stool inappropriate way	110	68.75%
Exclusive breastfeeding until 6 months of age	153	95.62%
Getting ORS at the time of diarrhoea	137	85.56%
Giving fluid at the time of diarrhoea	23	14.37%

*Multiple responses are given by the mother

Results

Table 1 The demographic characteristics of the mothers in the study area are as follows. Among the 160 mothers, the majority (59.37%) fall within the 26 to 30-year age group. A large number (41.8%) of the mothers are housewives, 30% are laborers and 13.75% are farmers. Most mothers have low educational levels, 61.25% are illiterate, 18.75% have completed primary education, and 15% have secondary education. About half of the mothers (47.5%) are from the Scheduled Tribe category, 21.25% are from the General class, and 13.75% are from the Scheduled Caste.

Table 2 Mothers' knowledge about the causative factors, prevention, and signs and symptoms of diarrhea among children under 5 years of age is as follows. Seventy percent of mothers correctly identify contaminated water as a primary cause of diarrhea. Respondents were permitted to answer multiple times. In addition, 62.5% of mothers also believe that teething can cause diarrhea. Other causes of diarrhea include unhygienic surroundings (47.5%), incomplete immunization (35%), bottle feeding (29.37%), and worm infestations (11.25%).

Eighty-two percent of mothers believe that drinking clean water can prevent diarrhea, and 88.7 percent know that hand washing with soap is important. There were multiple responses from mothers about their knowledge of the signs and symptoms of dehydration. The most common signs of dehydration were lethargy (55.62%) and irritability (79.37%). In addition, 23.75% of mothers know that low urine output is also a sign of dehydration.

Table 3 Attitudes of mothers towards preventive and management measures for diarrhea in their children less than 5 years of age are as follows. Most mothers (85.56%) give ORS (Oral Rehydration Solution) during episodes of diarrhea. In addition, 68.75% of mothers disposed of their children's stool properly. Mothers use boiled, clean water for drinking during diarrhea episodes (82.5%). 95.62% of mothers practice exclusive breastfeeding for their children.

Discussion:

Acute watery diarrhea that starts suddenly and is frequent, watery, loose stools without visible blood and lasts less than two weeks. Viral, bacterial, and parasitic infections are common causes of diarrhea. A cross-sectional study was done among mothers of children less than 5 years of age, residing in a village under the rural health training center of our college. Data collection was conducted from July to October 2023. The current study is based on an analysis of 160 mothers of children under 5 years old.

The study shows that 59.37% of mothers fall in the age group of 21 to 25 years, similar to the study done by Behura Subas et al. in Odisha,[11] where 67.85% of mothers were in the age group of 18 to 25 years.

In our study, only 1.25% of mothers are in the 15-to-20-year age group and a similar proportion (1.25%) is in the >35-year age group. The findings are consistent with those of Behura Subas et al. (2002) where 4.33% of the population was aged 35 years and above and 2.04% were in the 18-year age group.[11]

The majority of mothers of children were illiterate (61.25%) and 30% were daily wage laborers. A similar study conducted by Gohiya P. et al. in Bhopal revealed that most of the mothers were housewives (57.3%) and 27.2% were daily wage laborers.[12]

Education is an important tool to change healthcare-seeking behavior and family practices. It is well known that knowledge affects behavior, especially in the area of child-rearing practices and healthcare decisions.[13] Tumwine J.K. et al. in their study in East Africa also found that the level of education of the family is a risk factor for diarrhoea.[14] Questions were asked of mothers with children under 5 years of age about the causes of diarrhea, sanitation, immunization, feeding habits, and hygienic practices. The majority of mothers in our study gave multiple responses to the causes of diarrhea. In particular, 62.5 percent of mothers said teething causes diarrhea, and 47.5 percent said it is caused by unhygienic surroundings. The findings underscore a huge knowledge gap and lack of awareness about the real causes of diarrhea in the community.

In a similar study by Gohiya P. et al 41% reported having an underlying disease process for diarrhea while only a few considered seasonal effects. But misconceptions like tooth eruption causing diarrhea persisted.[12] Their findings show that the community is ignorant and unaware of the real causes of diarrhea. Most mothers (70%) correctly identified contaminated water or fluids as the main cause of diarrhea in our study. As in the study by Khaliti et al., 81% and 58% of mothers recognized unsafe water and improper hand washing as causes of diarrheal illness.[15] Cobatbat et al. reported that 77%, 34%, and 23% of mothers thought unsafe drinking water, failure to wash hands after defecation, and improper handling of feces were common causes of illness.[16] Choudhary P. et al. also found similar

misconceptions about teething as Other studies from India and Iran had reported that 64% and 48% of mothers held this misconception.[16,17,18]

In our study, the majority (85.56%) of mothers administer ORS fluid during episodes of diarrhea. Sudhir Ben Nelson et al. in Kanyakumari conducted a study and found that 50% of participants used ORS at home and 38.7% were aware that ORS is used to correct dehydration.[19]

In our study, exclusive breastfeeding was observed in 61.25% of mothers, which is similar to a study in rural Aligarh but much lower than a study in rural Haryana.[20] Another important finding in our study was that the population was unaware of the importance of exclusive breastfeeding as a preventive measure for diarrhea and continuation of breastfeeding during diarrheal illness. Washing hands with soap after defecation and while handling their children was reported by 71% of mothers in our study. In a study by Sudhir Ben Nelson et al., 76% of mothers washed their hands after defecation,[18] and Banda et al. found that 86% of children under 15 years of age in rural Chennai washed their hands regularly.[21]

The high percentage of these practices in our study indicates that mothers in the study area have favorable attitudes toward recommended preventive and management measures for diarrhea. That they're willing to do these practices means that they value their children's health and well-being and might be open to health education and interventions to change them to practice these behaviors.

Conclusion

This cross-sectional study of rural Udaipur district reveals that knowledge about diarrheal diseases is generally poor. Some aspects of diarrheal disease are known to the majority, but others are known only to a minority. In general, mothers in this study have satisfactory knowledge and attitude regarding diarrheal disease, as most use ORS during diarrheal episodes, continue breastfeeding, and wash their hands before cooking food for their children. ORS and zinc tablets should be given a greater role by healthcare providers in preventing dehydration. In addition, clarity is indicated over the need for behavior change communication and promotion of safe water handling practices. In particular, we recommend hands-on training in the proper methods of boiling water and disinfecting household wells to improve hygiene practices.

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