

# Mother's Practice on Home-Based Management of Diarrhea in Age Under-Five Children: A Systematic Review

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## ABSTRACT

Diarrhea is the third leading cause of death in children under five worldwide. Poor home management by mothers can lead to dehydration, malnutrition, and the need for hospital treatment. This study aimed to describe mothers' practices at-home management of diarrhea in under-five children. The methodology of this study was a systematic review. The literature search strategy uses keywords according to the research topic, namely "maternal practices," "management of diarrhea in children" AND "home-based management of diarrhea." The databases used include ScienceDirect, ProQuest, EBSCOhost, SageJournals, and Google Scholar-articles taken from 2019 to 2024. The entire database provided 286 articles, and 20 met the inclusion criteria. The articles show that maternal practices in managing diarrhea in under-five children at home include providing oral rehydration solution (ORS), giving zinc, continuing to feed, and washing hands. Some mothers' practices are good, but some mothers' practices are still poor. Home management of diarrhea in under-five children requires the mother's role. Good mothers caring for children will prevent dehydration and other complications.

**KEYWORDS:** Child health; diarrhea; home-based management; mothers; practice; under-five children

## INTRODUCTION

Diarrhea is an essential problem in under-five children. Diarrhea can be acute (less than 14 days) or chronic (more than 14 days)<sup>1</sup>. During diarrhea, water and electrolytes (sodium, chloride, potassium and bicarbonate) are lost through feces and vomiting<sup>2</sup>. Dehydration occurs when water and electrolyte loss cannot be replaced<sup>3</sup>. Children with diarrhea also experience decreased zinc<sup>4</sup>. Zinc is an essential micronutrient for children's health and growth<sup>5</sup>. Diarrhea in children can cause stunted growth, malnutrition, impaired cognitive development and dehydration<sup>6</sup>.

Dehydration is a factor causing high deaths due to diarrhea<sup>7</sup>. Diarrhea is the third cause of death in children under five worldwide, with 1.7 billion cases every year and the death of around 443,832 children<sup>8</sup>. Children experience an average of two to three episodes of diarrhea per year<sup>9</sup>. Most toddlers, 53.4%, experience episodes of diarrhea every 6 months and 21.2% experience episodes of diarrhea every 2/3 months<sup>10</sup>.

Management of most cases of acute diarrhea can be done at home<sup>11</sup>. These include assessment of fluid and electrolyte balance disorders, rehydration, zinc supplementation and restarting an adequate diet<sup>4</sup>. Home management of diarrhea in under-five children

requires the role of the mother<sup>12</sup>. Mothers need to be taught to monitor signs of dehydration, monitor fluids entering through the mouth, and assess the frequency of defecation and the amount lost through feces<sup>13</sup>. Mothers with good knowledge about oral rehydration therapy (ORT) can better prevent dehydration and accelerate the recovery of children<sup>14</sup>. Mothers who understand the benefits of zinc can better provide more comprehensive care for toddlers with diarrhea<sup>15</sup>. Other studies show that many mothers still face challenges managing diarrhea due to socioeconomic factors and access to information and support from health service providers<sup>16</sup>.

Although many studies have explored the effectiveness of various interventions in diarrhea management, there is significant variation in implementing these practices at home. Practices in caring for children with diarrhea are influenced by knowledge, perception, self-efficacy, awareness, the mother's skills in diarrhea management, the mother's relationship with professional staff, parental support, and the mother's perceived<sup>17-19</sup>. Studies often focus on a specific geographic area or intervention, so a comprehensive picture of maternal practices in diarrhea management across contexts is still inadequate. Therefore, a systematic observation not limited to a specific area or intervention is needed to identify general trends, challenges and opportunities in home-based diarrhea management practices across global contexts. An overview of diarrhea management carried out by the mother will help determine the right strategy to increase the mother's knowledge and skills. This systematic review aims to describe mothers' practices on home-based management of diarrhea in under-five children.

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**METHODOLOGY**

**Search Strategy**

This systematic review evaluated studies that provide data on maternal practices in home-based management of diarrhea in children under five years old. A comprehensive literature search was conducted using a combination of keywords relevant to the research topic, including "maternal practices," "diarrhea management in children," and "home-based management of diarrhea." Boolean operators (AND, OR) were employed to refine the search and ensure the inclusion of relevant studies. The search strategy incorporated keywords representing the population (mothers of children under five), condition (diarrhea management), and context (home-based care).

Searches were conducted across multiple databases, including ScienceDirect, ProQuest, EBSCOhost, SageJournals, and Google Scholar, covering studies published from January 2019 to August 2024. The search was limited to articles published in English.

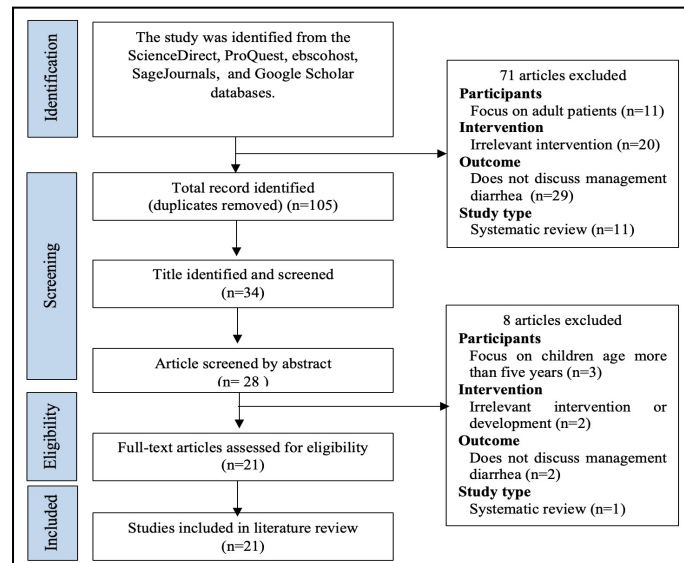
The inclusion criteria were as follows: (1) studies involving mothers of children under five with diarrhea, (2) original research articles published in peer-reviewed international journals between 2019-2024, and (3) articles written in English.

The exclusion criteria included (1) articles without an abstract or full text available, (2) systematic reviews, literature reviews, and meta-analyses, as these are secondary sources

**Screening Process**

After the search, all identified studies were imported into EndNote for reference management. Duplicate records were identified and removed using the "Find Duplicates" function in EndNote. Following the removal of duplicates, the studies were screened in two stages. First, titles and abstracts were reviewed to exclude studies that did not meet the inclusion criteria. In the second stage, full-text articles were assessed to ensure they met all the criteria for inclusion.

**Figure I: Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)**



Two reviewers independently conducted the selection process. Any disagreements were resolved through discussion or by involving a third reviewer. The PRISMA flow diagram summarizes the study selection process (Figure I).

**RESULTS & DISCUSSION**

Researchers used the Preferred Reporting Items for Systematic Review and Meta-Analysis parameters (PRISMA) flow chart to obtain research articles that were suitable and eligible (Figure I). In total, 258 articles were found in all databases. After screening, 71 articles were found to be excluded. Articles were excluded because they focus on adult patients, are irrelevant interventions, and do not discuss the management of diarrhea and systematic review. Then, 34 articles were re-screened, and 21 met the inclusion criteria. (Table I)

**Table I: Distribution of included studies about mother's practice on home-based management of diarrhea**

Author, year of publication	Design	Country	Subject of study	Results
Alhadeer <i>et al.</i> , 2021 <sup>20</sup>	Cross-sectional	Saudi Arabia	1140 mothers	23% of respondents could not identify critical signs of severe diarrhea; 66% stated that diarrhea was caused by teething; 62% of mothers knew oral rehydration therapy (ORS); 23.5% did not provide oral rehydration therapy for children who had diarrhea.
Shewangizaw <i>et al.</i> , 2023 <sup>6</sup>	Cross-sectional	Ethiopia	238 mothers	58.6% of respondents did not know the signs of dehydration. 55.5% of respondents had heard about ORS from community health centres. 52.9% of mothers agreed that ORS is better than traditional medicine for treating diarrhea, 37.9% of mothers/caregivers did not agree that giving ORS and fluids make diarrhea worse, and 44% thought that ORS could make diarrhea worse.
Yimenu <i>et al.</i> , 2022 <sup>1</sup>	Cross-sectional	Ethiopia	306 caregivers	The practice of caregivers is complementary feeding 49.7%; 96.4% give ORS, and only 67.3% give zinc; type of home-made oral solutions are sugar and salt solution 20.8%, rice water 44.0%.
Ndayisaba <i>et al.</i> , 2022 <sup>21</sup>	Cross-sectional	Rwanda	160 mothers	51.9% of mothers did not know that nausea and vomiting were symptoms of diarrhea, and 70.6% did not know that children tend to urinate less frequently during diarrhea. 64.4% knew the components of ORS, but 82.5% did not know how to make ORS correctly, and 73.1% did not know the function of ORS. 55% do not agree to use breast milk, rice water, or clean water to treat diarrhea in their children.

Terefe <i>et al.</i> , 2022 <sup>13</sup>	Cross-sectional	Ethiopia	335 caregivers	93,6% said feeding should be continued; 51,5% provided a typical family diet; 85,3% gave more fluid than usual; 69,6% used salt with water; 44% were unsure of ORS, and 54% started ORS on the second day.
Kassa <i>et al.</i> , 2021 <sup>22</sup>	Cross-sectional	Ethiopia	414 mothers	40.8% followed correct feeding practices, 36% increased breastfeeding frequency, and 30% increased fluid intake and food intake.
Momoh <i>et al.</i> , 2022 <sup>23</sup>	Cross-sectional	Nigeria	360 mothers	55% of respondents visit the hospital during children's diarrhea episodes, and 31.7% go to the pharmacy. The quantity of breast milk fed to children during diarrhea is 48.9% more than usual and 30.8% same as usual, 42.5% of the food was given more than usual and 34.2% less. 68.9% used oral rehydration solution during diarrhea, and 31.1% did not use ORS.
Thiam <i>et al.</i> , 2019 <sup>24</sup>	Cross-sectional	Senegal	367 mothers	Diarrhea management practices in Senegal do not comply with international recommendations, and coverage of ORS and zinc is still lacking.
Fufa <i>et al.</i> , 2019 <sup>25</sup>	Cross-sectional	Ethiopia	559 caregivers	Poor home-based management diarrhea practices occurred in 85.6% of rural and 55.8% of urban residents. Almost all respondents knew about ORS and the amount of water used to dissolve ORS. 86.8% of ORS was not available at home. 47.6% did not know about zinc, 50.8% did not know the duration of zinc administration, and 47.6% did not know the importance of zinc.
Das <i>et al.</i> , 2022 <sup>26</sup>	Qualitative study	Pakistan	13 participants	The research results show several things: -The misinformed belief that breastfeeding should be withheld during diarrhea -Customary for certain foods to be given or withheld during diarrheal episodes. -Older people use traditional healing methods by drinking cardamom, mint water, or onion juice on the armpits and face. -A lack of awareness, knowledge and trust causes the low use of ORS.
Nankali <i>et al.</i> , 2023 <sup>19</sup>	Quasi-experimental study	Iran	160 mothers	71% of mothers' feeding practices were still low, 63.9% needed to wash their hands before preparing or serving food, and 65.7% still made mistakes in preparation and feeding. 61.1% were still wrong in hand washing techniques, and 54.3% were still lacking in applying compresses.
Rosdiana <i>et al.</i> , 2022 <sup>27</sup>	Qualitative study	Indonesia	The 12 informants	The perception of mothers with children's diarrhea is an essential factor in the mother's first response to her child's diarrhea.
Kacan <i>et al.</i> , 2022 <sup>28</sup>	Cross-sectional	Turkey	577 mothers	The traditional practices most preferred by mothers in cases of child diarrhea are feeding bananas (92.5%), feeding fat-free mashed potatoes (90.6%), feeding rice porridge (79%), giving children boiled water to drink (58.2%), feeding food with rice flour (50.8%).
Ahmed <i>et al.</i> , 2024 <sup>29</sup>	Cross-sectional	Turkey	50 mothers	The majority do not know how to prepare ORT for use in the prevention/treatment of dehydration caused by diarrhea.
Khanal <i>et al.</i> , 2023 <sup>10</sup>	Cross-sectional	Nepal	216 mothers	52.4% of mothers have a fair knowledge of ORS, 23.3% have poor and 24.3% have good knowledge. More than half of the participants did not know the role of ORS; 58.2% knew that boiled or clean water was necessary to prepare ORS. 78.8% of the participants knew that 1 liter of water was needed for 1 packet of ORS.
Duguma <i>et al.</i> , 2021 <sup>30</sup>	Cross-sectional	Ethiopia	422 mother	Respondents' knowledge showed that 59% was good, and 52% of respondents' practice regarding administering ORS and zinc was good.
Kulkarni <i>et al.</i> , 2021 <sup>5</sup>	Cross-sectional	India	200 mothers	Only 10 mothers gave zinc supplementation. Indifference to zinc supplements is a common reason for not giving zinc supplements.
Rehman <i>et al.</i> , 2021 <sup>31</sup>	Cross-sectional	Pakistan	100 mothers	34% of mothers knew about zinc and provided zinc. 66% of mothers did not know zinc and had not practiced giving zinc to toddlers.
Awoala <i>et al.</i> , 2023 <sup>32</sup>	Cross-sectional	Nigeria	161 mothers	34.8% of practices in home management of diarrhea were good. Only 34.2% identified danger signs of diarrhea; 43% started treatment at home when their child had diarrhea, but only 14% provided appropriate treatment.
Ndou <i>et al.</i> , 2021 <sup>33</sup>	Cross-sectional	South Africa	398 caregivers	Most have sufficient knowledge about diarrhea, oral rehydration therapy/sugar-salt solution and its use during diarrhea.
Singh <i>et al.</i> , 2024 <sup>34</sup>	Cross-sectional	India	600 mothers	96% of mothers had good knowledge, 89.83% had positive attitudes, and 79.33% followed good practices regarding diarrhea management

Effective home-based management is crucial for reducing the severity of diarrhea and preventing dehydration, a significant risk factor for mortality. The review synthesized findings from 20 studies conducted in various countries, revealing substantial variations in knowledge, attitudes, and practices related to diarrhea management. Key findings include widespread misconceptions about ORS and zinc,

disparities based on educational and socioeconomic factors, and varying levels of adherence to recommended practices.

Most studies highlight that knowledge about home-based diarrhea management among mothers is often insufficient. This lack of understanding is concerning, as ORS and zinc are critical in preventing dehydration and reducing diarrhea severity<sup>35</sup>. In Pakistan, few

mothers administer zinc, indicating a gap in knowledge and practice<sup>26</sup>. Similarly, findings from India reveal that despite good knowledge about ORS, actual practices often fall short<sup>5</sup>; this underscores the need for targeted education to bridge the gap between knowledge and practice<sup>36</sup>.

Research from Nigeria shows that mothers with lower educational attainment generally exhibit poorer knowledge and less effective practices for managing diarrhea<sup>21,33</sup>. This trend is also evident in other regions where lower education levels correlate with inadequate diarrhea management. In contrast, studies from India suggest that mothers with higher educational backgrounds demonstrate better knowledge and practices<sup>34</sup>; this highlights the importance of tailored educational interventions that address the specific needs of different socioeconomic and academic groups.

The utilization of ORS varies widely across different regions and settings. Oral rehydration solution<sup>37</sup>. Although many mothers are aware of ORS in Ethiopia, incorrect usage and delay in administration are common issues<sup>13,22</sup>. In Nigeria, while knowledge of ORS is present, it does not always translate into proper use<sup>23</sup>. On the other hand, research from India indicates that when educational programs are effective, there is a notable improvement in ORS usage and practices<sup>34</sup>. Factors associated with using recommended home-made fluids include other maternal education, the number of children, and the number of mothers with antenatal care<sup>38</sup>. The higher the mother's knowledge, the higher the mother's practice using ORS<sup>39</sup>. Zinc deficiency is one of the significant risk factors for prolonged diarrhea in children under 2 years of age with acute diarrhea<sup>40</sup>. Based on the study results, mothers are still not optimal when giving zinc when their child has diarrhea. 34% had given zinc supplementation, while 66% had not given zinc to children<sup>31</sup>. Another study stated that only 56.2% of parents gave zinc to their children who had diarrhea, and 43.8% did not give zinc<sup>25</sup>. Zinc reduced the number of diarrheal episodes and their severity but did not affect the duration<sup>41</sup>.

Misconceptions and traditional beliefs about diarrhea management persist in some regions. In Pakistan and Indonesia, for instance, there are widespread misconceptions, such as the need to withhold breastfeeding during diarrhea or reliance on traditional remedies<sup>26,27</sup>. Breastfeeding reduces the risk of diarrheal disease severity, hospitalization and death from diarrhea<sup>42</sup>. These beliefs can lead to suboptimal care practices. In Senegal, despite awareness, practices often do not align with international recommendations<sup>24</sup>.

In countries like Ethiopia and Nigeria, community health support and economic conditions are directly related to mothers' knowledge and practices<sup>22,33</sup>. Mothers are more likely to engage in effective diarrhea management practices in settings with robust health support systems.

Based on these findings, there is a need for improved health education on diarrhea management, including the correct use of ORS and zinc. Educational programs should be tailored to mothers' academic backgrounds and include easily understandable information<sup>13,21</sup>. Additionally, community-based approaches and support from healthcare providers are crucial for increasing awareness and changing practices<sup>24,25</sup>.

## CONCLUSION

This systematic review reveals significant gaps and variations in home-based diarrhea management among mothers of children under five. While many mothers are familiar with oral rehydration solution (ORS), they often lack detailed knowledge of its correct use, and the use of zinc remains insufficiently understood. Practices differ widely based on educational background and socioeconomic status, with better management seen among more educated and resourceful mothers. To address the misconceptions, such as avoiding breastfeeding or using traditional remedies, further impact effective diarrhea management, targeted educational programs on ORS and zinc, improved resource accessibility, and culturally sensitive health education are essential. Enhancing these areas can lead to better practices and reduce the impact of diarrhea on child health.

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## AUTHOR CONTRIBUTION

Mariyam M: Conceptualization, methodology, validation, formal analysis, writing original draft, project administration.

Arief YS: Methodology, validation, formal analysis, review and editing

Krisnana I: Methodology, validation, formal analysis, review and editing

Makhfudli M: Methodology, validation, formal analysis, review and editing

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