Mosul Journal of Nursing

Online ISSN: 2663-0311 - Print ISSN: 2311-8784
Website: https://mjn.uomosul.edu.iq

Mothers' Knowledge, Attitudes, and Practices Regarding the Prevention and Home Management of Diarrheal Diseases in Children Under Five: A Study Among Kurdish Women

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ARTICLEINFO

Keywords:

Mothers
Knowledge
Attitude
Practice
Diarrhea
Prevention
Home Management
Children Under Five

Abstract

Background: Diarrheal diseases remain a leading cause of morbidity and mortality among children under five, particularly in developing regions. Effective home-based management and prevention strategies are crucial in reducing the severity and complications of diarrhea. This study aims to assess mothers' knowledge, attitudes, and practices (KAP) regarding the prevention and home management of diarrheal diseases in children under five in Zakho and Duhok, Kurdistan, Iraq.
Methods: A cross-sectional study involving 400 mothers was conducted from March 1 to April 1, 2023. Data was collected through structured face-to-face interviews using a validated questionnaire. The collected data were analyzed using SPSS version 26, employing descriptive and inferential statistical methods.
Results: Among the participants, 282 (70.5%) demonstrated good knowledge regarding diarrheal disease prevention and management, while 208 (52%) exhibited a positive attitude. However, only 233 (58.25%) of the mothers adhered to good practices in managing diarrhea at home. The findings indicate a gap between knowledge and practice, suggesting potential barriers to effectively implementing preventive and treatment strategies.
Conclusion: Despite a high level of knowledge about diarrheal disease management, gaps remain in translating knowledge into practice. Strengthening educational interventions and community-based awareness programs is essential to improving mothers' practices and ensuring better health outcomes for children under five.

What is already known about the topic?

- ***Diarrheal diseases*** *remain one of the leading causes of morbidity and mortality among children under five years of age, particularly in low- and middle-income countries.*

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DOI: 10.33899/mjn.2025.146454.1100, Authors, 2025, College of Nursing, University of Mosul.
Date Received 18 July 2024; Received in revised form 24 November 2024; Accepted 10 December 2024, Available online 01 January 2025

Introduction

Diarrheal diseases remain a significant public health concern, particularly among children under five years of age in developing countries. The World Health Organization (WHO) defines diarrhea as the passage of three or more loose or watery stools per day, including any additional bowel movements perceived as abnormal or excessively frequent by caregivers (WHO, 2021). Clinically, diarrhea is categorized into acute watery diarrhea, acute bloody diarrhea, and persistent diarrhea lasting more than 14 days (Kosek, Bern, & Guerrant, 2003). Globally, diarrhea is one of the leading causes of child mortality, accounting for 4.9 deaths per 1,000 children under five years annually, with the highest risk occurring during the first year of life (Siziya, Muula, & Rudatsikira, 2009). In Iraq, where nearly 45% of the population is under 15 years old and 17% (approximately 3.9 million) are under five years, diarrhea is the second most common cause of childhood deaths (Harb et al., 2019).

The impact of diarrhea extends beyond mortality, contributing to malnutrition and an increased risk of other infectious diseases, exacerbating child morbidity and mortality in low-resource settings (Waqar, Hassanain, & Khateeb, 2014). The primary causes of acute diarrhea in children include viral, bacterial, and parasitic infections, with viruses accounting for approximately 70% of cases (Al-Khafaji & Al-Jiboury, 2013). Rotavirus, in particular, has been identified as a major pathogen responsible for pediatric diarrhea in Iraq, with infection rates reported in hospitals across Basra, Erbil, Tikrit, and Baghdad ranging from 18.5% to 37% (Al-Kubaisy et al., 2015).

Preventive measures such as improved sanitation, access to clean water, handwashing with soap, exclusive breastfeeding for the first six months of life, and timely rotavirus vaccination play crucial roles in reducing diarrheal diseases (UNICEF & WHO, 2004). Handwashing alone can decrease diarrhea incidence by 23% to 48% (Zangana et al., 2020). Additionally, oral rehydration therapy (ORT) has been recognized as an effective treatment strategy, preventing over one million deaths annually during the 1990s (WHO, 2004). However, despite its proven efficacy, the knowledge and utilization of ORT and other home-based treatments vary widely among mothers, potentially influencing childhood health outcomes (Masiha et al., 2015).

While diarrhea is preventable and treatable, gaps in maternal knowledge, attitudes, and practices (KAP) continue to pose significant challenges. Misconceptions, traditional

beliefs, and inadequate home-based management strategies contribute to the severity of diarrhea and related complications (Ghasemi et al., 2013). Therefore, this study aims to assess the knowledge, attitudes, and practices of mothers in Zakho and Duhok, Kurdistan, Iraq, regarding the prevention and home-based management of diarrheal diseases in children under five. Understanding maternal perceptions and behaviors is essential for designing targeted interventions to enhance diarrhea management and improve child health outcomes.

Materials and Methods

This study employed a cross-sectional research design to evaluate the knowledge, attitudes, and practices of mothers regarding the prevention and home-based management of diarrheal diseases in children under five. The study was conducted between March 1 and April 1, 2023, in Zakho and Duhok, Kurdistan, Iraq, targeting mothers with children under five years old.

Study Population and Sampling

A total of 400 mothers participated in the study, all of whom met the inclusion criteria: (a) having at least one child under five years old, and (b) having previous experience managing childhood diarrhea. Mothers without children under five or those without prior exposure to diarrhea-related care were excluded. Participants were recruited from general hospitals in Zakho and Duhok using a convenience sampling method.

Data Collection and Instrumentation

Data were collected through face-to-face structured interviews conducted by four trained college students. The study utilized a validated structured questionnaire comprising five sections: (1) sociodemographic characteristics, (2) knowledge about diarrhea prevention and management, (3) attitudes toward diarrhea treatment, (4) home-based practices, and (5) health-seeking behaviors. The questionnaire was pretested for validity and reliability before administration.

Data Analysis

Data were analyzed using IBM SPSS Statistics (Version 26). Descriptive statistics, including frequencies, percentages, and means, were used to summarize the findings. Knowledge, attitude, and practice scores were categorized based on the mean scores: participants scoring above the mean were classified as having good knowledge, positive

attitudes, and good practices, while those scoring below the mean were categorized as having poor knowledge, negative attitudes, and poor practices.

Ethical Considerations

Ethical approval for the study was obtained from the College of Medicine, University of Zakho, Kurdistan Region, Iraq. Participants were informed about the study objectives, and informed consent was obtained before data collection. All responses were anonymized to ensure confidentiality.

Results

A total of 400 mothers participated in the study, yielding a 100% response rate. The mean age of the mothers was 27 years, with 50.7% falling within the 25-34 years age group. The majority identified as Muslim (69.5%) or Yazidi (29.5%), and 96.8% were of Kurdish ethnicity. Most participants were housewives (84%), while 12.3% were employed. Among the children, 49.5% were aged between 6 and 24 months.

Knowledge of Diarrhea Prevention and Management

Among the participants, 282 (70.5%) had good knowledge regarding diarrhea prevention and home-based treatment. The majority (93.3%) correctly identified diarrhea as the passage of loose stools at least three times per day. The most frequently cited causes of diarrhea were contaminated water (75.5%), teething (20.8%), and superstitions such as the "evil eye" (1.3%). Only 24.3% of mothers identified lethargy as a danger sign of diarrhea, while 1.3% recognized excessive thirst as a critical indicator.

Attitudes Toward Diarrhea Management

The study revealed that 208 (52%) of mothers held positive attitudes toward diarrhea management, while 192 (48%) had negative perceptions. Approximately 56.5% agreed that oral rehydration solution (ORS) should be available at home, and 57.3% believed that diarrhea could be managed effectively at home. However, 79.8% of mothers reported that their children disliked the taste of ORS, potentially influencing adherence to treatment recommendations.

Home-Based Practices and Management Strategies

Despite relatively high knowledge levels, only 233 (58.25%) of mothers demonstrated good practices in home-based diarrhea management. 30.8% prepared homemade ORS correctly, while 56.3% knew the appropriate volume of water required for mixing ORS sachets. However, only 30% administered ORS after each loose stool, and 44.3% provided

less fluid than usual during episodes of diarrhea. Regarding hand hygiene, 51.5% of mothers washed their hands before preparing food, 41.8% after defecation, and 4.8% before feeding their children.

Health-Seeking Behavior

During diarrhea episodes, 87% of mothers sought medical advice. Among them, 51.2% visited health centers, 39.5% consulted hospitals, while others turned to clinics (3.3%) or pharmacies (1.3%).

Overall, the findings indicate a gap between knowledge and practice, highlighting the need for targeted health education programs to bridge this disparity and enhance maternal diarrhea management strategies.

Table 1

Sociodemographic Characteristics of Participants (N = 400)

Characteristic	Category	Frequency (n)	Percentage (%)
Mother's Age (years)	15–24	88	22.0
	25–34	203	50.7
	35–44	104	26.0
	45+	5	1.3
Child's Age (months)	<6	73	18.3
	6–24	196	49.0
	24–60	131	32.8
Mother's Occupation	Housewife	336	84.0
	Employed	49	12.3
	Self-employed	15	3.8
Mother's Education	Illiterate	161	40.3
	Primary School	99	24.8
	Secondary School	80	20.0
	Diploma	60	15.0
Mother's Religion	Muslim	278	69.5
	Christian	4	1.0
	Yazidi	118	29.5
Mother's Ethnicity	Kurdish	387	96.8
	Arab	13	3.3

Note: Percentages are rounded to one decimal place.

Table 2

Mothers' Knowledge Regarding Diarrheal Disease (N = 400)

Variable	Category	Frequency (n)	Percentage (%)
Definition of Diarrhea	≥3 loose stools per day	373	93.3
	Normal stool pattern	17	4.3
	Bloody stools	1	0.3
	Greenish stools	3	0.8
	No idea	6	1.5
Causes of Diarrhea	Teething	83	20.8
	Evil eye	5	1.3
	Contaminated water	302	75.5
	No idea	10	2.5
Danger Signs of Diarrhea	Weakness/Lethargy	97	24.3
	Repeated vomiting	172	43.0
	Bloody stool with fever	126	31.5
	Marked thirst for water	5	1.3

Note: Responses reflect the knowledge level of participants based on structured questionnaire items.

Table 3: Mothers' Knowledge of ORS Preparation and Administration (N = 400)

Variable	Category	(n)	(%)
Correct ORS Preparation	1 sachet in 300 ml water	11	2.8
	1 sachet in 500 ml water	96	24.0
	1 sachet in 600 ml water	26	6.5
	1 sachet in 1000 ml water	225	56.3
	1 sachet in 1500 ml water	21	5.3
	Other	21	5.3
ORS Administration Frequency	After each loose stool	120	30.0
	Once per day	52	13.0
	2–3 times per day	174	43.0
	Whenever child wants to drink	54	13.5
Duration of ORS Use	24 hours (1 day)	283	70.8
	48 hours (2 days)	66	16.5
	72 hours (3 days)	46	11.5
	96 hours (4 days)	4	1.0
	Other	1	0.3

Note: ORS = Oral Rehydration Solution.

Table 4: Mothers' Feeding and Hygiene Practices During Diarrhea Episodes (N = 400)

Practice	Category	(n)	(%)
Breastfeeding Frequency	Less than usual	165	41.3
	Same as usual	36	9.0
	More than usual	119	29.8
	Child not breastfed	58	14.5
	Don't know	22	5.5
Fluid Intake During Diarrhea	Less than usual	177	44.3
	Same as usual	47	11.8
	More than usual	167	41.8
	Child not breastfed	3	0.8
	Don't know	6	1.5
Food Intake During Diarrhea	Less than usual	331	82.8
	Same as usual	42	10.5
	More than usual	12	3.0
	Child not breastfed	2	0.5
	Don't know	13	3.3
Handwashing Practices	Before food preparation	206	51.5
	Before feeding child	19	4.8
	After defecation	167	41.8
	Never	8	2.0

Note: Feeding and hygiene practices impact the recovery and prevention of diarrheal diseases.

Table 5 : Healthcare-Seeking Behavior of Mothers During Diarrhea Episodes (N = 400)

Variable	Category	(n)	(%)
Sought Advice or Treatment	Yes	348	87.0
	No	52	13.0
Primary Healthcare Facility	Hospital	158	39.5
	Health center	205	51.2
	Health post	9	2.3
	Clinic	13	3.3
	Pharmacy	5	1.3
	Friends/Relatives	10	2.5

Note: Data reflects maternal care-seeking behaviors for children under five.

Discussion

This study assessed the knowledge, attitudes, and practices (KAP) of mothers regarding the prevention and home-based management of diarrheal diseases among children under five in Zakho and Duhok, Kurdistan, Iraq. The findings revealed that while a significant proportion of mothers demonstrated adequate knowledge, their attitudes and practices did not always align with evidence-based recommendations. This discrepancy suggests a need for enhanced health education and behavioral interventions to improve home management of diarrheal diseases.

Mothers' Knowledge of Diarrheal Disease Prevention and Management

The study found that 70.5% of mothers had a good level of knowledge regarding diarrhea prevention and management. This rate is higher than that reported in similar studies conducted in Kashan, Iran (28.8%) (Ghasemi et al., 2013) and Pakistan (58%) (Masiha et al., 2015), indicating relatively better awareness in the study population. However, misconceptions persist, with 20.8% of mothers attributing diarrhea to teething, a belief that is inconsistent with medical evidence. Previous studies in Saudi Arabia (Alghadeer et al., 2021) and India (Merga & Alemayehu, 2015) have also identified teething as a common misconception regarding diarrheal causes. Addressing these misperceptions through targeted education campaigns is crucial for improving maternal understanding of diarrhea's infectious etiology.

Mothers' Attitudes Toward Diarrheal Disease Management

Despite relatively high knowledge levels, only 52% of mothers exhibited positive attitudes toward home-based diarrhea management. While 56.5% of participants agreed that oral rehydration solution (ORS) should be available at home, 79.8% reported that their children disliked the taste of ORS, which may contribute to low adherence. These findings align with previous research indicating that taste aversion can be a barrier to ORS usage, necessitating alternative formulations or educational strategies to encourage its continued use (Lange et al., 2014). Additionally, while 57.3% of mothers believed that diarrhea could be managed effectively at home, others preferred immediate medical consultation, which may indicate a lack of confidence in home-based management strategies.

Mothers' Practices in Home-Based Management of Diarrheal Disease

The study identified a gap between knowledge and practice, with only 58.25% of mothers demonstrating good practices in managing diarrhea at home. Although 56.3% correctly identified the recommended ORS preparation (1 sachet in 1000 ml of water), only 30% administered ORS after each loose stool, and 44.3% provided less fluid than usual during diarrhea episodes. These findings are concerning because dehydration is the primary risk associated with diarrhea, and proper ORS administration is a life-saving intervention (WHO, 2004). Studies in Kenya (Othero et al., 2008) and India (Saurabh et al., 2014) have similarly reported low ORS utilization rates, suggesting that despite awareness, misconceptions and inconsistent application of knowledge remain barriers to effective diarrhea management.

Hand hygiene is another critical factor in diarrhea prevention. In this study, 51.5% of mothers reported washing their hands before food preparation, and 41.8% washed their hands after defecation. These rates are lower than those reported in Ethiopia (67.8% and 100%, respectively) (Workie et al., 2018) and Bangladesh (60% and 3.1%, respectively) (Rabbi & Dey, 2013). Inadequate handwashing practices have been linked to higher rates of diarrheal diseases in children, emphasizing the need for hygiene education programs to reinforce proper handwashing techniques and their role in preventing infection.

Healthcare-Seeking Behaviors During Diarrhea Episodes

The study found that 87% of mothers sought medical advice during their child's diarrheal episodes, with the majority (51.2%) visiting health centers, while 39.5% consulted hospitals. This high rate of healthcare-seeking behavior contrasts with findings from studies in South Arabia (68.9%) (Alghadeer et al., 2021) and India (62.7%) (Saurabh et al., 2014). While timely medical consultation is essential in severe cases, excessive reliance on healthcare facilities for mild diarrheal cases could indicate a lack of confidence in home management. This highlights the need for maternal training programs to strengthen mothers' ability to differentiate between mild, moderate, and severe diarrhea and take appropriate action at home.

Implications for Public Health Interventions

The findings of this study underscore the urgent need for targeted health education programs that not only improve maternal knowledge but also enhance the translation of

knowledge into effective practices. The following interventions could help bridge the knowledge-practice gap:

1. Community-Based Health Education – Increasing awareness through community workshops and media campaigns focused on the correct preparation and administration of ORS, as well as dispelling misconceptions about diarrhea causes (e.g., teething).
2. Hygiene Promotion Programs – Integrating handwashing demonstrations into maternal and child health services to reinforce the importance of proper hygiene in diarrhea prevention.
3. Taste-Improved ORS Formulations – Exploring flavored ORS solutions or incorporating culturally acceptable homemade alternatives to improve compliance with oral rehydration therapy.
4. Behavioral Change Interventions – Using peer education and mother-to-mother support groups to encourage positive attitudes and consistent practices in home-based diarrhea management.

Strengths and Limitations of the Study

A major strength of this study is its large sample size (N = 400) and high response rate (100%), which enhance the generalizability of the findings to the broader population of mothers in Zakho and Duhok, Kurdistan, Iraq. Additionally, the study provides comprehensive insights into multiple dimensions of maternal knowledge, attitudes, and practices, offering practical recommendations for public health interventions.

However, this study has some limitations. First, the use of self-reported data may introduce social desirability bias, where mothers might overestimate their knowledge or adherence to best practices. Second, the cross-sectional design prevents the establishment of causal relationships between knowledge, attitudes, and practices. Future research should consider longitudinal studies to assess changes in maternal behavior over time following health education interventions.

Conclusion

This study highlights significant gaps between maternal knowledge and actual practices in managing diarrheal diseases among children under five. While mothers generally possess adequate knowledge, their attitudes and behaviors indicate room for

improvement, particularly in ORS utilization, fluid intake during diarrhea, and hygiene practices. Addressing these gaps through community health education, hygiene promotion, and behavior change strategies is essential to reduce childhood morbidity and mortality from diarrheal diseases. Strengthening home-based care knowledge and self-efficacy will empower mothers to manage diarrheal illnesses more effectively, reducing unnecessary healthcare visits and improving child health outcomes in Kurdistan, Iraq.

DECLARATION SECTION

Availability of data and material: Data is available at the request of the corresponding author.

Funding: We have not received any funding to execute this research study nor the rigorous procedure of collecting data and other associated processes to conduct this study.

Conflict of Interest Statement: None

Acknowledgments: The authors thank all the mothers who participated in this study for their time and cooperation. Special appreciation is extended to the healthcare staff in Zakho and Duhok for their support during data collection. Gratitude is also given to the research team and academic advisors for their guidance throughout the study.

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