By The Name Of Allah

University of Dongola

Faculty of Medicine and Health Sciences

Department of Community Medicine

RESEARCH PROPOSAL

Knowledge, Attitudes, and Practices of Mothers Regarding Childhood Diarrhea Attending Specialized Hospital, Dongola, 2026

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1. INTRODUCTION

1.1 Background

Diarrhea remains one of the most common childhood illnesses and a leading cause of morbidity and mortality among children under five worldwide, and it can result in dehydration, electrolyte loss, and malnutrition if not managed promptly. [1,2]

Globally, diarrheal disease is estimated to cause hundreds of thousands of under-five deaths and billions of episodes each year, with the burden falling disproportionately on low- and middle-income countries where safe water, sanitation, and health services are limited. [1,2]

In the Eastern Mediterranean Region, which includes Sudan, diarrheal disease continues to account for a substantial share of childhood deaths, with wide variation between countries driven mainly by differences in water supply, sanitation, and socioeconomic conditions. [3]

National surveys in Sudan have consistently shown a high prevalence of childhood diarrhea, with about one in four to one in three children under five reported to have had an episode in the two weeks before the survey, and higher rates among rural, younger, and poorer households. [4,5]

Childhood diarrhea is usually caused by intestinal infections transmitted through contaminated food, water, and poor hygiene, and is managed with oral rehydration solution, continued feeding, and zinc supplementation, while prevention relies on safe water, sanitation, handwashing, breastfeeding, and vaccination. [1,6,7,8]

Because mothers are usually the first to recognize and respond to a child's illness, their knowledge, attitudes, and practices directly shape how diarrhea is managed and prevented at home, making local assessment useful for guiding health education in this setting [9].

1.2 Problem Statement

Childhood diarrhea remains a major public health problem and an important cause of morbidity and mortality among children under five years of age. According to the World Health Organization (WHO) fact sheet updated on 7 March 2024, diarrhoeal disease is the third leading cause of death among children aged 1–59 months, causing approximately 443,832 deaths among children under five each year, with nearly 1.7 billion episodes of childhood diarrhoeal disease occurring annually worldwide [1].

The burden of childhood diarrhea remains substantial in Sudan. An analysis of the Sudan Multiple Indicator Cluster Survey (MICS) 2014, conducted nationally from August to December 2014, included 14,081 children under five years of age. During the two weeks preceding the survey, 29.3% had experienced diarrhoea, while only 18.9% received oral rehydration solution (ORS) and 14.8% received zinc supplementation [10].

Inappropriate home management, delayed recognition of danger signs, inadequate fluid replacement, and delayed healthcare-seeking may increase the risk of dehydration and other complications. Evidence from Sudan has also shown important gaps in mothers' recognition of dehydration and appropriate home management of childhood diarrhea [9].

Despite the availability of effective measures for prevention and treatment, the available evidence indicates persistent gaps in appropriate maternal practices. Therefore, there is a need to assess mothers' knowledge, attitudes, and practices regarding childhood diarrhea in the local hospital setting and to determine the factors associated with these outcomes.

1.3 Justification

Childhood diarrhea remains an important public health problem, particularly in low- and middle-income countries. Mothers play a central role in the prevention and home management of childhood diarrhea because their knowledge, attitudes, and practices influence recognition of symptoms and danger signs, use of ORS and zinc, continuation of feeding and breastfeeding, and decisions to seek healthcare [9,11,12].

Evidence from Sudan has demonstrated substantial gaps in maternal knowledge and practices. Ahmed et al. (1994) reported that fewer than 40% of mothers could identify symptoms and signs of dehydration, only 10% could relate danger signs to severe dehydration, and only 25% prepared and used ORS correctly [9].

Similar findings have been reported in other African settings. In Dire Dawa, Ethiopia, a 2016 hospital-based study of 295 mothers found that 65.2% had good knowledge, while 54.9% had a negative attitude and 58% had poor practice regarding prevention and home-based management of childhood diarrhea [11]. A 2024 systematic review and meta-analysis of 19 studies involving 7,470 participants in East Africa reported pooled estimates of 37.44% for good knowledge, 63.05% for favorable attitude, and 52.62% for good practice [12].

These findings indicate that mothers' knowledge, attitudes, and practices regarding childhood diarrhea are important areas for assessment. However, available evidence from Sudan is limited, particularly regarding mothers attending healthcare facilities in Dongola. The present study is therefore justified by the need for setting-specific evidence on maternal KAP regarding childhood diarrhea in this population.

1.4 Research Questions

• What is the level of knowledge of mothers regarding childhood diarrhea?

• What are the attitudes of mothers toward childhood diarrhea and its management?

• What practices do mothers use when their children develop diarrhea?

• What factors are associated with mothers' knowledge, attitudes, and practices?

1.5 Research Hypothesis

1. Research Hypothesis (H1): There is a significant association between mothers’ knowledge, attitudes, and practices regarding childhood diarrhea and selected socio-demographic characteristics.

2. Null Hypothesis (H0): There is no significant association between mothers’ knowledge, attitudes, and practices regarding childhood diarrhea and selected socio-demographic characteristics.

1.6 Objectives

1.6.1 General Objective

To assess the knowledge, attitudes, and practices of mothers regarding childhood diarrhea attending Specialized Hospital, Dongola, in 2026.

1.6.2 Specific Objectives

• To assess mothers' knowledge regarding childhood diarrhea.

• To assess mothers' attitudes toward childhood diarrhea and its management.

• To assess mothers' practices during episodes of childhood diarrhea.

2. LITERATURE REVIEW

2.1 Childhood Diarrhea

Childhood diarrhea is defined as the passage of three or more loose or liquid stools within a 24-hour period, or more frequent passage than is normal for the individual child. It remains one of the major causes of illness and death among children under five years of age, particularly in low- and middle-income countries. The major immediate complication is dehydration resulting from the loss of water and electrolytes through stool and vomiting [1,6].

2.2 Causes and Transmission of Childhood Diarrhea

Childhood diarrhea may be caused by a variety of infectious agents, including viruses, bacteria, and parasites. Transmission commonly occurs through the fecal–oral route and is associated with contaminated drinking water, contaminated food, inadequate sanitation, and poor hand hygiene [1,7].

Environmental and socioeconomic conditions can contribute substantially to the occurrence of childhood diarrhea. National and regional evidence has linked diarrheal morbidity with household and community conditions, including residence and access to appropriate treatment [3,5,10].

2.3 Clinical Features and Danger Signs

The common clinical manifestations of acute diarrhea include frequent loose or watery stools, vomiting, fever, abdominal discomfort, and reduced appetite. The major clinical concern is dehydration, which may range from mild to severe.

Important danger signs requiring prompt medical assessment include inability to drink or breastfeed, repeated vomiting, lethargy or unconsciousness, convulsions, blood in the stool, and signs of severe dehydration [1,6]. Early recognition of these signs by mothers and caregivers is important because delayed recognition and treatment may increase the risk of severe complications.

2.4 Dehydration

Dehydration is the most important acute complication of childhood diarrhea and results from excessive loss of water and electrolytes. The risk is particularly high in young children and in those with frequent watery stools or repeated vomiting. Oral rehydration solution (ORS) is an important component of the management of dehydration caused by diarrhea [6].

Evidence from Sudan demonstrates considerable gaps in maternal recognition and management of dehydration. A study conducted in rural Sudan reported that fewer than 40% of mothers could identify symptoms and signs of dehydration, while only 10% could relate danger signs to severe dehydration [9].

2.5 Home Management of Childhood Diarrhea

Appropriate home management includes giving additional appropriate fluids, continuing breastfeeding and feeding, using ORS correctly, and seeking medical care when danger signs are present [1,6]. Correct home management can reduce the risk of dehydration and other complications.

In rural Sudan, only 25% of mothers in one study prepared and used ORS correctly, despite high awareness of ORS. The same study reported withholding of breastfeeding and food and the use of traditional or potentially harmful practices during diarrheal episodes [9].

2.6 Oral Rehydration Solution and Zinc

ORS is a cornerstone of the management of acute childhood diarrhea because it replaces fluid and electrolytes lost during diarrheal episodes. Correct preparation and administration are essential for effective treatment [1,6].

Zinc supplementation is recommended as an adjunct to the management of childhood diarrhea. WHO guidance supports zinc supplementation because it can reduce the duration and severity of diarrheal episodes [8]. Evidence from Sudan has shown low use of both ORS and zinc among children with recent diarrhoea [10].

2.7 Prevention of Childhood Diarrhea

Prevention of childhood diarrhea depends on multiple measures, including access to safe drinking water, adequate sanitation, handwashing with soap, safe food preparation and storage, continued breastfeeding, appropriate complementary feeding, and vaccination according to national recommendations [1,7,13].

Maternal knowledge is an important component of preventive practices. Studies from Sudan and other African settings have demonstrated variation and gaps in mothers' knowledge and practices regarding prevention and home management of childhood diarrhea [9,11,14].

2.8 Mothers' Knowledge, Attitudes and Practices Regarding Childhood Diarrhea

Knowledge includes understanding of causes, modes of transmission, symptoms, danger signs, prevention, ORS, zinc, and appropriate home management. Attitudes refer to mothers' beliefs and perceptions regarding diarrhea and its treatment, while practices describe the actions taken during diarrheal episodes.

A Sudanese study found substantial gaps in mothers' knowledge and practices, including poor recognition of dehydration, low correct ORS use, and harmful practices such as withholding breastfeeding and food [9].

Evidence from other African settings also demonstrates variability in maternal KAP. In Dire Dawa, Ethiopia, 65.2% of mothers had good knowledge, but 54.9% had a negative attitude and 58% had poor practice [11]. In Lagos, Nigeria, a 2022 study of 360 mothers found that 59.2% had good knowledge, 59.2% had a positive attitude, and 53.1% had good practice [14].

A 2024 systematic review and meta-analysis of 19 studies involving 7,470 participants in East Africa reported pooled estimates of 37.44% for good knowledge, 63.05% for favorable attitude, and 52.62% for good practice of home-based diarrhea management [12].

2.9 Healthcare-Seeking Behavior

Healthcare-seeking behavior may be influenced by perceived severity, knowledge of danger signs, accessibility of health services, cost, distance, previous experiences, and family or cultural influences [15,16]. Delayed healthcare seeking may allow dehydration and other complications to progress.

2.10 Previous Studies on Maternal KAP

Previous studies have demonstrated that maternal knowledge, attitudes, and practices regarding childhood diarrhea differ according to educational level, socioeconomic conditions, access to healthcare, and local cultural practices [9,11,12,14].

In Sudan, Ahmed et al. (1994) identified substantial deficiencies in recognition of dehydration, ORS use, and appropriate feeding practices [9]. In Dire Dawa, Ethiopia, Workie et al. (2018) found good knowledge in 65.2% of mothers but negative attitude in 54.9% and poor practice in 58% [11]. In Lagos, Nigeria, Momoh et al. (2022) found good knowledge, positive attitude, and good practice in 59.2%, 59.2%, and 53.1% of mothers, respectively [14].

2.11 Knowledge Gap

Although several studies have investigated childhood diarrhea and maternal KAP in Sudan and other African countries, available evidence is not necessarily representative of mothers attending healthcare facilities in Dongola. Existing Sudanese evidence includes older community-based studies and national survey analyses, while the current study focuses specifically on mothers attending Specialized Hospital in Dongola [9,10].

Therefore, a setting-specific assessment of mothers' knowledge, attitudes, and practices regarding childhood diarrhea is appropriate, including recognition of danger signs, use of ORS and zinc, feeding and breastfeeding practices, preventive measures, and healthcare-seeking behavior.

3. MATERIALS AND METHODS

3.1 Study Design

An analytical cross-sectional study will be conducted among mothers attending Dongola Specialized Hospital in 2026. The study will assess mothers’ knowledge, attitudes, and practices regarding childhood diarrhea and examine associations between these outcomes and selected socio-demographic characteristics.

3.2 Study Area

The study will be conducted at Dongola Specialized Hospital, located in Dongola, the capital of Northern State, Sudan. Dongola is an important urban center in the state and provides healthcare services to residents of the city and surrounding areas. The hospital will serve as the study setting, where mothers attending with their children during the study period will be approached for participation, subject to the study’s eligibility criteria. Data will be collected using a structured questionnaire to assess mothers’ knowledge, attitudes, and practices regarding childhood diarrhea.

3.3 Study Period

The study will be conducted during 2026 according to the approved research timetable.

3.4 Study Population

Mothers accompanying or attending with children at the selected hospital during the study period.

3.5 Inclusion Criteria

• Mothers attending the hospital with a child during the study period.

• Mothers who agree to participate and provide informed consent.

3.6 Exclusion Criteria

• Mothers unable to complete the questionnaire.

• Mothers who are severely ill or in an unstable condition at the time of data collection.

3.7 Sampling Technique

A non-probability consecutive sampling technique will be used to recruit eligible mothers attending Dongola Specialized Hospital during the study period. Eligible mothers who provide informed consent will be invited to participate consecutively until the required sample size of 424 participants is achieved.

3.8 Sample Size

The sample size was calculated using Cochran's formula for cross-sectional studies:

$$\mathbf{n = Z2 \times P \times (1 - P) / d2}$$

Where n = sample size; Z = 1.96 (95% confidence level); P = 0.50 (expected proportion, assumed because no previous local estimate was available); d = 0.05 (margin of error).

Substituting the values in the formula:

$$\mathbf{n = (1.96)2 \times 0.50 \times (1 - 0.50) / (0.05)2}$$

$$\mathbf{n = (1.96 \times 1.96) \times (0.50 \times 0.50) / (0.05 \times 0.05)}$$

$$\mathbf{n = (3.8416 \times 0.25) / 0.0025}$$

$$\mathbf{n = 0.9604 / 0.0025}$$

$$\mathbf{n = 384.16 \approx 385}$$

Adding 10% for possible non-response:

$$\mathbf{385 + (385 \times 0.10) = 385 + 38.5 = 423.5 \approx 424}$$

Therefore, the final sample size is 424 mothers.

3.9 Data Collection Tool

A structured questionnaire will cover socio-demographic characteristics, knowledge, attitudes, practices, and healthcare-seeking behavior.

3.10 Study Variables

Independent variables may include maternal age, education, occupation, residence, number of children, and previous health education. Main outcomes will be knowledge, attitudes, and practices.

3.11 Operational Definitions

Childhood diarrhea: passage of loose or watery stools occurring more frequently than normal for the child, as defined by the study questionnaire.

Knowledge: the mother's score on questions assessing causes, symptoms, danger signs, prevention, and management.

Attitude: responses reflecting beliefs and perceptions toward childhood diarrhea and its management.

Practice: reported actions taken by the mother during an episode.

3.12 Data Collection Procedure

After ethical and administrative approval, eligible mothers will be informed about the study. After consent, the questionnaire will be completed and checked for completeness.

3.13 Quality Control

The questionnaire will be reviewed and may be pretested before the main study. Data collectors, if used, will receive appropriate instructions.

3.14 Data Analysis

Data will be entered, checked, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies and percentages, will be used to summarize the study variables. The Chi-square test will be used to assess associations between mothers' knowledge, attitudes, and practices regarding childhood diarrhea and selected socio-demographic characteristics. A p-value of less than 0.05 will be considered statistically significant.

3.15 Ethical Considerations

Ethical approval and hospital permission will be obtained. Participation will be voluntary with informed consent. Privacy and confidentiality will be maintained, and participants may decline or withdraw.

3.16 Questionnaire Structure

• Section A: Socio-demographic characteristics.

• Section B: Knowledge regarding childhood diarrhea.

• Section C: Attitudes toward childhood diarrhea.

• Section D: Practices during diarrhea episodes.

• Section E: Healthcare-seeking behavior and sources of information.

5. WORK PLAN AND TIMELINE

No.	Activity	September 2026	October 2026	November 2026
1	Preparation of research proposal	✓		
2	Submission of research proposal	✓		
3	Presentation of research proposal	✓	✓	
4	Data collection		✓	
5	Data analysis		✓	✓
6	Writing and discussion of the results		✓	✓
7	Writing the final report			✓
8	Electronic submission of research to the Department of Community Medicine			✓
9	Research review			✓
10	Research editing			✓
11	Research discussion			✓

6. BUDGET

Item	Estimated Quantity	Estimated Cost
Printing and photocopying	200 copies	100,000 SDG
Stationery	1 lot	75,000 SDG
Transportation	30 trips	150,000 SDG
Data entry/analysis	1 service	100,000 SDG
Communication/Internet	1 package	75,000 SDG
Total		500,000 SDG

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