

**KNOWLEDGE, ATTITUDE AND HOME MANAGEMENT PRACTICES OF ACUTE
WATERY DIARRHOEA AMONG MOTHERS OF UNDER-FIVE CHILDREN IN
BENIN CITY**

BY

CHINONSO BRIGHT AHAMEFULE

MED1807360

ELOGHOSA SMART AIYANYOR

MED1807362

**DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE
SCHOOL OF MEDICINE,
COLLEGE OF MEDICAL SCIENCES,
UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA.**

MAY 2026

**KNOWLEDGE, ATTITUDE AND HOME MANAGEMENT PRACTICES OF ACUTE
WATERY DIARRHOEA AMONG MOTHERS OF UNDER-FIVE CHILDREN IN
BENIN CITY**

BY

CHINONSO BRIGHT AHAMEFULE

MED1807360

ELOGHOSA SMART AIYANYOR

MED1807362

**BEING A ONE-YEAR PROJECT PRESENTED TO THE DEPARTMENT OF PUBLIC
HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, COLLEGE OF
MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE,
NIGERIA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
BACHELOR IN MEDICINE AND BACHELOR IN SURGERY (MBBS) DEGREE IN
THE UNIVERSITY OF BENIN, BENIN CITY**

MAY 2026

DEDICATION

CHINONSO BRIGHT AHAMEFULE

To my parents, Mr. and Mrs. Fidelis Ahamefule, whose constant encouragement and readiness to help whenever I call have been the foundation of my journey. To my elder brother, Ikechukwu Ahamefule, thank you for always being a source of support and stress relief. To my younger siblings, Mmesoma, Obinna, and Chidera, I strive each day to become better for you, and your presence inspires me to keep pushing forward. To my project partner, Smart Aiyanyor, your constant support, encouragement, and willingness to take on the difficult tasks made this work possible. And to my colleagues, thank you for your companionship, guidance, and shared commitment, which made this journey lighter and more rewarding.

ELOGHOSA SMART AIYANYOR

To my late father, Elder Smart Aiyanyor, you were the first to declare that I would become a doctor. That voice has never left me. Your life was a testament that God is good, and your legacy continues to brighten my path and shape the person I am becoming. Though you are no longer here, your voice, values, and vision echo in every step I take. To my mother, Mrs. Angela Aiyanyor, my praying machine and unwavering pillar, your boundless love, relentless sacrifices, and enduring strength have been the foundation upon which my dreams stand.

To my siblings, Pharm (Dr) Moses Aiyanyor, thank you for being a worthy model. Your sacrifices are not unnoticed. God bless you richly. To Engr. Godspower, thank you for believing in me more times than I believed in myself. To Mommy DDD, Victory, Efosa, and Itohan

Aiyanyor, your support and encouragement have been my constant source of strength and inspiration.

To my cherished friends and project partner, Ahamefule Chinonso, your commitment made this journey not just bearable, but deeply fulfilling. Ultimately, to God Almighty, my anchor and stay, for His unending grace, favour, mercy, guidance, and sustenance through every trial and triumph. Without him, none of this would have been possible.

DECLARATION

We declare that this research project titled “Knowledge, attitude and home management practices of acute watery diarrhoea among mothers of under five children in Benin city” was conducted under supervision and has not been submitted in part or in full for any purpose.

AHAMEFULE CHINONSO BRIGHT

Date

MED1807360

08079576787

chinonsoahamefule29@gmail.com

AIYANYOR SMART ELOGHOSA

Date

MED1807362

09060182374

aiyanyoreloghosa@gmail.com

CERTIFICATION

This is to certify that this research study titled “Knowledge, attitude and home management practices of acute watery diarrhoea among mothers of under five children in Benin city” was conducted by Chinonso Bright Ahamefule with matriculation number MED1807360 and Eloghosa Smart Aiyanyor with matriculation number MED1807362 under the supervision of Prof. Vivian Omuemu in the Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) degree.

Supervisor

Professor (Mrs.) Vivian O. Omuemu

MBBS, MPH, MD, FMCPH, FWACP FNAMed

Head of Department

Dr. (Mrs.) O. E. Obarisiagbon

MBBS, MPH, FMCPH

ACKNOWLEDGEMENT

We wish to express our grand and heartfelt gratitude to our project supervisor, **Prof. Vivian O. Omuemu**, whose phenomenal guidance, intellectual depth, and staggering commitment to excellence were instrumental to the success of this work. Her keen attention to detail, patience, and constructive feedback shaped every stage of this research. Beyond this project, her motherly nature, mentorship has significantly influenced our growth and perspective as aspiring medical professionals and researchers.

We also extend our sincere appreciation to the faculty and staff of the **Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin**, for providing a supportive, stimulating, and conducive academic environment that made this research achievable.

Our heartfelt thanks go to our colleagues and peers who contributed in diverse ways during the course of data collection and throughout this study. Your cooperation, encouragement, and shared commitment made this journey both productive and memorable.

We remain deeply grateful to our families, whose unwavering support, sacrifices, and encouragement have been our constant source of strength and motivation throughout our academic journey.

Above all, we return all glory to God Almighty, for His boundless grace, wisdom, and strength that sustained us from the beginning of this project to its successful completion.

TABLE OF CONTENTS

Title Page.....	i
Cover page	ii
Dedication.....	iii
Declaration.....	v
Certification	vi
Acknowledgement	vii
Table of Contents	viii
List of Tables.....	xii
List of Abbreviation.....	xiv
Definition of Terms.....	xv
Abstract.....	xviii

CHAPTER ONE

INTRODUCTION	1
1. 1 Background	1
1.2 Statement of the Problem	4
1.3 Justification for the Study.....	7
1.4 Research Questions	9
1.5 Research Objectives	10

CHAPTER TWO

LITERATURE REVIEW.....	11
------------------------	----

2.0 Conceptual Framework	11
2.1 Knowledge of Mothers about the Causes, Symptoms, and Management of Acute Watery Diarrhea.....	13
2.2 Maternal Attitudes to the Management of Acute Watery Diarrhea.....	19
2.3 Maternal Practices in the Management of Acute Watery Diarrhea.....	23
2.4 Factors Associated with Mothers' Knowledge, Attitudes, and Practices Regarding the Management of AWD	28
2.5 Barriers Faced by Mothers in Accessing Healthcare Services for the Management of AWD in children under five.....	32

CHAPTER THREE

MATERIALS AND METHODS	39
3.1 Study Area.....	39
3.2 Study Design	40
3.3 Study Population	40
3.4 Inclusion and Exclusion Criteria	40
3.5 Study Duration	41
3.6 Sample Size Determination.....	41
3.7 Sampling Technique	42
3.8 Data Collection Tool	44
3.9 Training of Research Assistants.....	47
3.10 Pretesting.....	48
3.11 Data Collection Procedure.....	48

3.12 Method of Data Analysis.....	48
3.13 Measurement of Variables and Scoring-.....	50
3.14 Ethical Considerations.....	53
3.15 Limitations of the Study.....	53
3.16 Benefits of the Study.....	53
CHAPTER FOUR: RESULTS	55
Section A: Respondents' Sociodemographic Characteristics	56
Section B: Respondents' knowledge of causes, symptoms and home management of acute watery diarrhoea in under-five children	62
Section C: Respondents' attitude towards the management of acute watery diarrhoea in under-five children	77
Section D: Home management practices of respondents in managing acute watery diarrhoea in under-five children	90
Section E: Barriers faced by mothers in Benin City in accessing healthcare services for the management of acute watery diarrhoea in children under five.....	111
CHAPTER FIVE: DISCUSSION	117
Conclusion	129
Recommendations	130
REFERENCES	133
APPENDIX I	
Informed Consent Form.....	140
APPENDIX II	

Questionnaire Design.....	146
APPENDIX III	
List of Wards in the Selected Local Government Areas.....	155
APPENDIX IV	
Selected Streets in the Selected Wards.....	156
APPENDIX V	
Gantt Chart.....	158
APPENDIX VI	
Ethical Clearance.....	159
APPENDIX VII	
Plagiarism Test Certificate.....	160

LIST OF TABLES

Table 1a: Socio-demographic characteristics of respondents.....	57
Table 1b: Socio-demographic characteristics of respondents.....	59
Table 2: Characteristics of under- five children in respondent households.....	60
Table 3: Household characteristics of respondents.....	61
Table 4a: Respondents' knowledge of causes and symptoms of acute watery diarrhoea.....	63
Table 4b: Respondents' knowledge of causes and symptoms of acute watery diarrhoea.....	65
Table 5: Respondents' knowledge of home management of acute watery diarrhoea in under- five children.....	66
Table 6: Overall knowledge of home management of acute watery diarrhoea.....	68
Table 7: Association between socio-demographic characteristics and respondents' knowledge of home management of acute watery diarrhoea.....	69
Table 8: Association between characteristics of under- five children and respondents' knowledge of home management of acute watery diarrhoea.....	72
Table 9a: Predictors of knowledge of home management of acute watery diarrhoea among respondents.....	74
Table 9b: Predictors of knowledge of home management of acute watery diarrhoea among respondents.....	76
Table 10: Respondents' attitude toward home management of acute watery diarrhoea.....	78
Table 11: Overall attitude toward home management of acute watery diarrhoea.....	81
Table 12a: Association between socio-demographic characteristics and respondents' attitudes	

toward home management of acute watery diarrhoea.....	82
Table 12b: Association between socio- demographic characteristics and respondents’ attitudes toward home management of acute watery diarrhoea.....	84
Table 13a: Predictors of attitude toward management of diarrhoea.....	86
Table 13b: Predictors of attitude toward management of diarrhoea.....	88
Table 14a: Respondents’ practices in the home management of acute watery diarrhoea.....	91
Table 14b: Respondents’ practices in the home management of acute watery diarrhoea.....	93
Table 14c: Respondents’ practices in the home management of acute watery diarrhoea.....	95
Table 15: Preventive practices against childhood diarrhoea among respondents.....	97
Table 16: Overall practice toward home management of acute watery diarrhoea.....	99
Table 17a: Association between socio- demographic characteristics and respondents’ practices in the home management of acute watery diarrhoea.....	100
Table 17b: Association between socio- demographic characteristics and respondents’ practices in the home management of acute watery diarrhoea.....	103
Table 18a: Predictors of maternal home management practices.....	106
Table 18b: Predictors of maternal home management practices.....	109
Table 19a: Barriers faced by respondents in accessing healthcare services for management of acute watery diarrhoea.....	112
Table 19b: Barriers faced by respondents in accessing healthcare services for management of acute watery diarrhoea.....	114

Table 19c: Barriers faced by respondents in accessing healthcare services for management of acute watery diarrhoea.....	116
--	-----

LIST OF ABBREVIATIONS

AOR	Adjusted Odds Ratio
AWD	Acute Watery Diarrhoea
CI	Confidence Interval
GAPPD	Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea
GAVI	Global Alliance for Vaccines and Immunization
HIV	Human Immunodeficiency Virus
KAP	Knowledge, Attitude, and Practice
LGA	Local Government Area
MSESPCD	Maternal Self-Efficacy Scale for Prevention of Childhood Diarrhea
NDHS	Nigeria Demographic and Health Survey
NFE	Non-Formal Education
NPI	National Programme on Immunization
OR	Odds Ratio
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
PHCC	Primary Health Care Centres
SDG	Sustainable Development Goal
SEM	Social Ecological Model
SSS	Salt and Sugar Solution

UNICEF	United Nations International Children's Emergency Fund
WASH	Water and Sanitation Hygiene
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Acute Watery Diarrhoea (AWD): A condition characterized by the sudden onset of frequent, watery stools without visible blood, typically lasting less than 14 days. It can lead to dehydration, which is particularly dangerous in young children.

Attitudes: A person's feelings, beliefs, perceptions, and predispositions toward a particular subject, issue, or behaviour. Attitudes influence how an individual evaluates and responds to different situations, often shaping their willingness or reluctance to adopt certain behaviours.

Convenience Sampling: a non-probability sampling technique in which participants are selected based on their easy availability and accessibility to the researcher, rather than random selection. It is often used when quick and inexpensive data collection is needed, though it may limit the generalizability of findings.

Cronbach's Alpha: a measure of internal consistency or reliability of a questionnaire or test. It indicates how closely related a set of items are as a group. A higher Cronbach's alpha (typically ≥ 0.7) suggests that the items measure the same underlying concept.

Dehydration: A condition resulting from excessive loss of body fluids, which can occur rapidly in children with acute watery diarrhoea. Symptoms include dry mouth, sunken eyes, decreased urine output, and lethargy.

Exclusion Criteria: are specific conditions or characteristics that disqualify potential participants from being included in a study. These are set to minimize confounding factors or risks, and to ensure the safety and appropriateness of study participation.

Gantt Chart: a visual project management tool that illustrates a project schedule. It displays activities or tasks along a timeline, showing their start and end dates, duration, and overlap. It helps in planning, coordinating, and tracking project progress.

Home-Based Management: Strategies and practices employed by caregivers within the home setting to prevent and treat illnesses, such as administering ORT, maintaining hygiene, and ensuring proper nutrition during episodes of diarrhoea.

Inclusion Criteria: are predefined characteristics used to identify who is eligible to participate in a research study. These criteria ensure that the study population is appropriate for addressing the research question (e.g., age range, diagnosis, geographic location).

Knowledge: The awareness, understanding, and factual information an individual possesses about a specific subject, gained through education, experience, or research. It includes the ability to recall, recognize, and comprehend concepts, facts, or procedures.

Multistage Sampling: a probability sampling technique that involves selecting samples in two or more stages, typically using a combination of different sampling methods (e.g., random selection of clusters, followed by random sampling within those clusters). It is useful in large, geographically dispersed populations.

Oral Rehydration Therapy (ORT): A simple, cost-effective treatment for dehydration caused by diarrhoea, involving the oral intake of a solution made from clean water, salt, and sugar to replenish lost fluids and electrolytes.

Practice: The actual actions, behaviours, or habits exhibited by an individual in relation to a specific subject. Practices reflect how knowledge and attitudes translate into real-life behaviours and can be influenced by cultural, social, and environmental factors.

Preventive Measures: Actions taken to reduce the risk of disease occurrence, such as promoting handwashing, using safe drinking water, and practicing proper sanitation to prevent the spread of diarrhoea-causing pathogens.

Socio-Demographic Factors: Characteristics of individuals that may influence health outcomes, including age, education level, income, occupation, and marital status.

Under-Five Children: Children who are younger than five years old. This age group is often the focus of health studies due to their vulnerability to diseases like diarrhoea.

ABSTRACT

BACKGROUND: Acute watery diarrhoea (AWD) remains a major cause of morbidity and mortality among children under five years, particularly in low- and middle-income countries such as Nigeria. Despite the proven effectiveness of Oral Rehydration Therapy (ORT) and zinc supplementation, inadequate maternal knowledge, negative attitudes, and poor home management practices persist as key barriers to prevention and control. This study assessed the knowledge, attitude, and home management practices (KAP) of mothers regarding acute watery diarrhoea and identified factors influencing care-seeking behaviour in Benin City, Edo State.

METHODS: A community-based descriptive cross-sectional study was conducted among 631 mothers of under-five children in Benin City, Edo State. A multistage sampling technique selected participants from Egor and Ovia North-East LGAs to represent urban and peri-urban settings. Data were collected using a pretested, interviewer-administered structured questionnaire. The instrument was adapted from WHO/UNICEF diarrhoeal disease management guidelines and peer-reviewed KAP studies. Data entry and analysis were performed with IBM SPSS version 26. Descriptive statistics summarized socio-demographic characteristics and key study variables. Chi-square and Fisher's exact tests assessed associations between categorical variables. Logistic regression identified predictors of knowledge, attitude, and practice levels. Statistical significance was set at $p < 0.05$. Ethical approval was obtained from UBTH Health

Research Ethics Committee. Verbal and written informed consent was secured; participation was voluntary and confidentiality maintained.

RESULTS: The mean age of respondents was 31.6 ± 5.2 years. Most respondents had attained tertiary education (52.0%), and nearly half belonged to households earning ₦90,000–₦250,000 (47.1%) monthly. Overall, 471 (74.7%) of respondents demonstrated adequate knowledge of acute watery diarrhoea (AWD) and its management. Most mothers correctly defined diarrhoea as the passage of watery stools three or more times daily (81.5%) and identified contaminated food or water as the commonest cause (84.6%). About four-fifths (79.7%) were aware of oral rehydration solution (ORS), yet only 59.4% knew the correct ingredients. Knowledge was significantly associated with education level ($\chi^2 = 57.437, p < 0.001$), marital status ($\chi^2 = 19.285, p < 0.001$), and skill level ($\chi^2 = 11.047, p = 0.026$). Knowledge increased with higher education, marital stability, and occupational skill level—that is, mothers with tertiary education, those who were married, and those in higher skill categories were more likely to have adequate knowledge of acute watery diarrhoea and its management. Logistic regression showed that respondents with at least secondary education were more than twelve times more likely to have adequate knowledge (OR = 12.48; 95% CI: 4.32–35.99; $p < 0.001$). A total of 497 (78.8%) respondents had a positive attitude toward the home management of acute watery diarrhoea. Majority, 552 (87.6%) recognized diarrhoea as a serious illness and 571 (90.5%) affirmed the need for early medical care; however, 355 (56.2%) still associated diarrhoea with teething. Positive attitude was significantly associated with education level ($\chi^2 = 106.088, p < 0.001$) and knowledge level ($\chi^2 = 80.184, p < 0.001$). Respondents with higher levels of education and adequate knowledge were significantly more likely to exhibit a positive attitude toward the home management of acute watery diarrhoea. Multivariate analysis showed that mothers with adequate

knowledge were over four times more likely to exhibit a positive attitude (OR = 4.52; 95% CI: 2.78–7.34; $p < 0.001$).

In contrast, only 206 (32.6%) demonstrated good home management practices. While 246 (75.0%) respondents used ORS during diarrhoeal episodes, only 120 (36.6%) continued breastfeeding and 137 (41.8%) administered zinc supplements. Preventive measures such as 474 (75.1%) practicing handwashing before feeding and 335 (53.1%) maintaining exclusive breastfeeding were common, though only 188 (29.8%) reported rotavirus vaccination. Good practice was significantly associated with education level ($\chi^2 = 22.687, p < 0.001$), skill level ($\chi^2 = 11.358, p = 0.023$), and number of under-five children ($\chi^2 = 17.108, p < 0.001$). Mothers with higher education, those engaged in higher-skilled occupations, and those with fewer under-five children were more likely to demonstrate good home management practices. Additionally, mothers with adequate knowledge were less likely to exhibit poor practices (OR = 0.29; 95% CI: 0.17–0.48; $p < 0.001$). Regarding barriers, 447 (70.8%) sought care at a health facility during diarrhoeal episodes, whereas others cited belief in spontaneous recovery (62; 9.8%), long distance to facilities (35; 5.5%), and financial constraints (24; 3.8%). Only 311 (49.3%) had received prior health education—mainly from 210 (33.3%) health workers. Among those reporting challenges at health facilities, 31 (67.4%) mentioned long waiting times, 6 (13.0%) cited overcrowding, and 3 (6.5%) reported poor staff attitude.

CONCLUSION: Most mothers in Benin City had good knowledge and positive attitudes toward managing acute watery diarrhoea, but actual home practices were poor. Education and knowledge strongly influenced proper management, while financial and access barriers hindered care-seeking. Strengthening health education, ensuring steady ORS and zinc supply, and

addressing socioeconomic challenges are essential to improve home management and reduce diarrhoea-related child deaths.

KEYWORDS: Acute Watery Diarrhoea, Mothers, Under-Five Children, Knowledge, Attitude, Practice, Benin City, Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Among children under five, acute watery diarrhoea is a major source of illness and mortality, especially in underdeveloped nations.¹ Diarrhoea is a leading killer of children, accounting for approximately 9 percent of all deaths among children under age 5 worldwide in 2021. This translates to over 1,200 young children dying each day, or about 444,000 children a year, despite the availability of a simple treatment solution.² The World Health Organization (WHO) defines diarrhoea as having loose or watery stools at least three times a day, or more frequently than is typical for a person.¹ Even though the majority of childhood diarrhoea bouts are minor, severe occurrences can cause dehydration and substantial fluid loss, which can be fatal or have other serious repercussions if fluids are not replenished as soon as diarrhoea symptoms appear.³

Predisposing factors for diarrhoea in Nigeria are multifaceted. In many communities, suboptimal breastfeeding practices, improper weaning foods, and limited caregiver knowledge contribute to the transmission of pathogens.⁴ The Nigerian context is further complicated by socioeconomic disparities and a reliance on informal water sources—many families reside in informal settlements with limited access to safe drinking water and proper sanitation facilities.^{5,6} Inadequate healthcare infrastructure and delayed health-seeking behaviour further exacerbate the risk of severe dehydration and death among children.⁴ Cultural beliefs, such as misconceptions about the causes of diarrhoea and the role of traditional remedies, often impede the effective utilization of proven interventions like ORT. For instance, studies in Lagos and Kaduna State

have demonstrated that while awareness of ORT is relatively high, only a fraction of mothers use it correctly at home.^{4, 6}

Diarrhoea is a preventable disease with several effective interventions. The WASH (Water, Sanitation, and Hygiene) strategy, developed by WHO, emphasizes improved water quality, proper sanitation, and hygiene practices such as handwashing with soap.¹ Other prevention measures include early and exclusive breastfeeding, vitamin A supplementation, and rotavirus vaccination, which WHO has recommended for global implementation into routine immunization programs.¹ It has been shown that appropriate water, sanitation and hygiene interventions can reduce diarrhoea incidence by 26% and mortality by 65%.⁷

Several global and national initiatives have been launched to combat diarrhoea-related child mortality. The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD), developed by WHO and UNICEF, seeks to reduce under-five deaths by increasing vaccine coverage, improving sanitation, and promoting ORT and zinc supplementation.⁸ The Global Vaccine Alliance (Gavi) has supported the widespread introduction of the rotavirus vaccine in low-income countries, significantly decreasing the incidence of severe diarrhea.⁹ Supporting this, a systematic analysis showed that following vaccine introduction, median reductions in acute gastroenteritis hospitalizations/ED visits were 32% among children <1 year and 38% among children <5 years, achieved with a median vaccine coverage of 83% over approximately 3 years.¹⁰ In Nigeria, national policies such as the National Programme on Immunization (NPI) and the National Water, Sanitation, and Hygiene (WASH) Policy have been implemented to address the burden of diarrheal diseases.¹¹

Despite these efforts, diarrhoea remains a significant public health concern in Nigeria. According to the Nigeria Demographic and Health Survey (NDHS) 2023–24, only 24% of children under five who experienced diarrhoea received the recommended treatment of ORS combined with zinc, a marginal improvement from 23% in 2018.¹² Moreover, the proportion of caregivers seeking treatment for diarrhoea in children under five declined from 65% in 2018 to 60% in 2023–24, highlighting a gap in treatment-seeking behavior.¹²

The burden of acute watery diarrhoea among children under five directly aligns with several Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being), which seeks to reduce preventable child mortality and ensure universal health coverage.¹³ Diarrheal diseases remain a leading cause of childhood mortality, and addressing them through improved knowledge, attitudes, and practices (KAP) in home management contributes to achieving SDG Target 3.2, which aims to end preventable deaths of newborns and children under five by 2030.^{13, 14}

Additionally, inadequate water supply, poor sanitation, and hygiene practices are major contributors to the incidence of diarrheal diseases, linking this study to SDG 6 (Clean Water and Sanitation). SDG Target 6.1 calls for universal and equitable access to safe drinking water, while Target 6.2 emphasizes the need for adequate and equitable sanitation and hygiene for all.^{13, 15} Strengthening interventions such as the WASH (Water, Sanitation, and Hygiene) strategy directly supports these targets by reducing diarrhoea-related morbidity and mortality.¹³

Moreover, the economic burden of diarrheal diseases on low-income families, combined with disparities in access to healthcare, aligns with SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities).¹³ Children from lower socioeconomic backgrounds are disproportionately affected due to poor living conditions and limited access to healthcare services. By assessing maternal knowledge and health-seeking behaviors, this study aims to inform policies and interventions that can bridge these health inequities.

The interplay of inadequate infrastructure, cultural beliefs, and gaps in caregiver knowledge underscores the need for localized research. This study, therefore, aims to assess the knowledge, attitudes, and practices (KAP) of mothers in Benin City regarding the management of acute watery diarrhoea, with a view to identifying specific gaps that hinder effective home-based care. Addressing these gaps is essential not only for reducing diarrhoea-related mortality but also for achieving broader public health goals such as those outlined in the SDGs.

1.2 STATEMENT OF THE PROBLEM

Acute watery diarrhoea (AWD) remains one of the leading causes of morbidity and mortality in children under five globally, despite substantial advancements in healthcare.¹ It is estimated that diarrhoea accounts for 9% of all child deaths worldwide, making it the third leading cause of death among this age group.² Children who are malnourished or have impaired immunity, as well as people living with HIV, are most at risk of life-threatening diarrhea.¹ According to the World Health Organization (WHO), nearly 1.7 billion cases of childhood diarrheal disease occur each year, with a significant proportion resulting in severe dehydration and death if not managed effectively.¹ Each year diarrhoea kills around 443 832 children under 5 and an additional 50 851

children aged 5 to 9 years.¹ Nearly one in five deaths of a child – about 1.5 million each year – is due to the disease of diarrhoea. It kills more young children than malaria HIV/AIDS, and measles together.¹⁶ Most of these deaths are preventable through simple, cost-effective interventions such as oral rehydration therapy (ORT), zinc supplementation and improved sanitation.^{17, 18}

The burden of diarrhoea is disproportionately borne by developing countries, particularly those in sub-Saharan Africa and South Asia.^{1, 16} This is due to inadequate water, poor sanitation, suboptimal breastfeeding, and zinc and vitamin A deficiency. Vulnerable children living in impoverished and undeveloped areas also have higher fatality rates compared to children living in developed countries due to lack of access to quality healthcare, timely intervention, and effective treatment with oral rehydration solution (ORS) and zinc.¹⁷ In Nigeria, the diarrhoea prevalence rate is 18.8%. This is above the subcontinental average of 16% making it one of the worst in sub-Saharan Africa.^{16, 19} Annually, it accounts for over 16% of child deaths, mainly amongst children under five years of age.²⁰ The Nigerian Demographic and Health Survey (NDHS) 2018 reported that over 150,000 children die annually from diarrheal diseases.²¹ In 2024, Nigeria reported 359 cholera-related deaths within the first nine months, highlighting the ongoing struggle with waterborne diseases.²²

Diarrhoea remains a major contributor to under-five mortality in Nigeria, undermining efforts to meet global child survival targets. Although the under-five mortality rate in Nigeria has declined from 201 deaths per 1,000 live births in 2003 to 128 in 2013 and further to 109 in 2015, these figures remain well above the target of 25 deaths per 1,000 live births as stipulated by

Sustainable Development Goal 3.^{20, 23} As diarrhoea is a leading cause of death among children under five, addressing this disease is critical to reducing child mortality and achieving national and international health objectives.

Diarrhoea is one of the commonest illnesses that has the greatest negative impact on the growth and development of infants and young children.⁴ Apart from diarrhoea being a major cause of morbidity and mortality, it also has a significant impact on growth due to reduction in appetite, altered feeding practices, and decreased absorption of nutrients.⁴ A study in India reported a marked negative relationship between diarrhoea and the physical growth and development of children, with each day of illness resulting in a weight deficit of approximately 20–40 grams.²⁴ Research conducted in Guinea-Bissau found that infants who spent more than 20% of their time ill with diarrhoea had a weight deficit of about 370 grams at one-year follow-up.²⁵ Similarly, findings from a multi-country cohort study in Latin America showed that children who experienced diarrhoea in the first 24 months of life were, on average, 1.5 cm shorter than their peers who had no diarrhoeal episodes.²⁶ Hence, the adverse impact of diarrhoea on a nation like Nigeria cannot be far fetched with various scientific findings and correlation over the years.

Mothers, as primary caregivers, play a crucial role in the prevention and management of diarrhoea in children. However, studies have indicated that many mothers lack adequate knowledge and hold misconceptions about the causes and appropriate management of diarrhoea. For example, a study conducted in Lagos, Nigeria, revealed that only 59.2% of mothers knew enough about how to prevent and treat diarrhoea at home.⁴ Cultural beliefs and traditional practices further complicate effective management. Some mothers rely on traditional remedies or

delay seeking medical care due to misconceptions, which can lead to adverse outcomes.^{4, 6, 17} A study in Kaduna State, Nigeria, highlighted that while awareness of Oral Rehydration Therapy (ORT) was high, its utilization was low, with only 34.4% of mothers using ORT for home management of diarrhea.⁶

1.3 JUSTIFICATION OF THE STUDY

Diarrhoea remains a leading cause of morbidity and mortality among children under five, particularly in developing nations. Globally, despite numerous initiatives aimed at improving sanitation and promoting interventions like Oral Rehydration Therapy (ORT), the burden of diarrhoea persists. This ongoing challenge is partly attributable to significant gaps in caregiver knowledge, attitudes, and practices (KAP) regarding diarrhoea management.²⁸

Mothers play a crucial role as primary caregivers, and their understanding of diarrhoea prevention and home-based management directly influences child health outcomes. Research conducted in Lagos, Nigeria, revealed that only 53.1% of mothers demonstrated good practices in the prevention and home management of diarrhoea, while studies in Dire Dawa, Eastern Ethiopia, have shown that over half of the mothers hold negative attitudes towards diarrhoea management.^{4, 27} These findings underscore the detrimental impact of inadequate maternal KAP on timely healthcare-seeking and effective home management of diarrheal episodes.

In Benin City—the capital of Edo State—the situation is further complicated by socioeconomic diversity and limited access to essential resources. Many families reside in informal settlements where clean water and proper sanitation are scarce. Although various governmental and non-

governmental efforts have been made to promote public health education, there remains a significant gap in localized data concerning maternal KAP in the management of acute watery diarrhoea. This lack of data impedes the development of targeted, context-specific interventions that are crucial for reducing the burden of this preventable disease.

Furthermore, understanding the unique barriers that mothers in Benin City face—ranging from cultural misconceptions to systemic healthcare challenges—is critical for designing effective health education programs and policy initiatives. By identifying these gaps, the study aims to provide actionable insights for healthcare providers, policymakers, and public health practitioners. These insights can drive the formulation of interventions tailored to improve maternal practices, thereby contributing to broader public health goals such as Sustainable Development Goal (SDG) 3, which seeks to ensure healthy lives and promote well-being for all.

Given the significant impact of diarrhoea on child survival and its preventable nature, this study is both timely and necessary. It promises to contribute valuable evidence that will help reduce the incidence and mortality associated with diarrhoea among children under five in Benin City, ultimately leading to improved child survival rates and enhanced overall public health in the region.

1.4 RESEARCH QUESTIONS

1. What is the level of knowledge among mothers in Benin City regarding the causes, symptoms, and prevention of acute watery diarrhoea in children under five?
2. What attitudes do mothers in Benin City hold towards the severity and treatment of acute watery diarrhoea in children under five?
3. What are the common practices adopted by mothers in Benin City for managing acute watery diarrhoea in children under five at home?
4. What are the factors associated with mothers' knowledge, attitudes, and practices regarding the management of acute watery diarrhoea?
5. What are the barriers faced by mothers in Benin City in accessing healthcare services for the management of acute watery diarrhoea in children under five?

1.5 OBJECTIVES

General Objective:

To assess the knowledge, attitude, and practice of mothers in the management of acute watery diarrhoea in under-five children in Benin City.

Specific Objectives:

1. To determine the level of knowledge among mothers in Benin City about the causes, symptoms and management of acute watery diarrhoea in under-five children.
2. To examine the attitudes of mothers in Benin City towards the management of acute watery diarrhoea in under-five children.
3. To describe the practices of mothers in Benin City in managing acute watery diarrhoea in under-five children.
4. To identify the factors associated with mothers' knowledge, attitudes, and practices regarding the management of acute watery diarrhoea.
5. To identify the barriers faced by mothers in Benin City in accessing healthcare services for the management of acute watery diarrhoea in children under five.

CHAPTER TWO

LITERATURE REVIEW

2.0 Conceptual Framework

The management of childhood illnesses such as acute watery diarrhoea is shaped by multiple layers of influence, ranging from individual knowledge to broader community and structural factors. This study adopts the modified Social Ecological Model (SEM) as a conceptual framework to explain the multilevel factors that influence maternal behavior in the home management of acute watery diarrhoea in under-five children.²⁹

The SEM posits that behavior is not shaped in isolation but rather occurs within a complex system of interactions across various levels—individual, interpersonal, community, and societal. In this study, maternal knowledge, attitudes, and practices (KAP) are situated within this broader context:

Individual level: Encompasses the mother's personal knowledge of diarrhoea, her perception of its causes and severity, as well as her confidence in managing the illness at home.

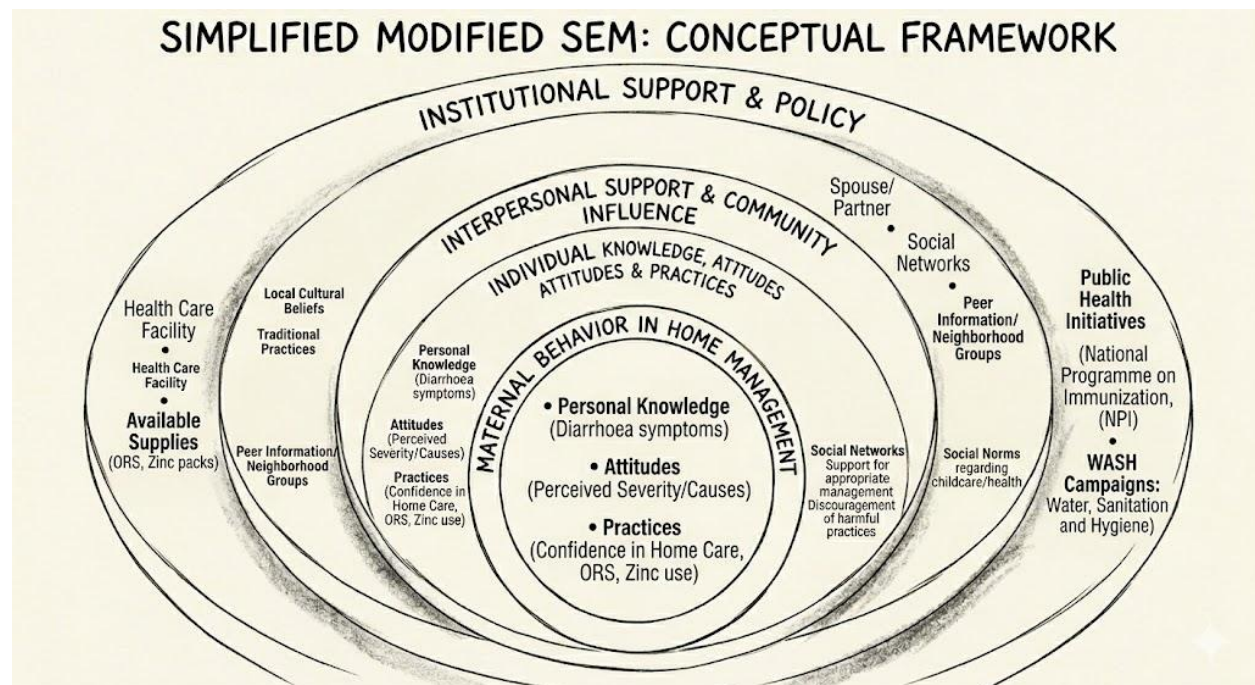
Interpersonal level: Includes influences from spouses, family members, and social networks that may support or discourage appropriate diarrhoea management (e.g., use of ORS, continued feeding).

Community level: Refers to local cultural beliefs, traditional practices, and access to peer information within the neighbourhood or community groups.

Institutional and policy level: Involves access to healthcare facilities, the availability of essential supplies like ORS and zinc, and the impact of public health initiatives such as the National Programme on Immunization (NPI) or Water, Sanitation and Hygiene (WASH) campaigns.

By applying this model, the study seeks to understand not only the internal factors (knowledge, attitudes) but also the external barriers and facilitators (e.g., healthcare access, cultural beliefs, and institutional support) that affect a mother's capacity to effectively manage acute watery diarrhoea at home.

This framework provides a structured understanding of how various factors interact to influence health behaviour, and it underscores the need for interventions that operate across multiple levels of influence—targeting not just individuals, but also their environments, institutions, and systems.



2.1 Knowledge of Mothers about the Causes, Symptoms, and Management of Acute Watery Diarrhoea

Several studies have assessed maternal knowledge regarding the causes, symptoms, and management of diarrhoea in under-five children across different settings.

A cross-sectional web-based study conducted in Bursa, Turkey in 2022 assessed the knowledge levels and traditional practices of 577 mothers regarding diarrhoea, using a snowball sampling method via online forms.³⁰ The study found that mothers demonstrated a relatively high diarrhoea knowledge score (mean 22.01 ± 3.72 out of 26 items).³⁰ However, the reliance on online sampling may have excluded less-educated mothers without internet access, potentially limiting the generalisability of the findings to the broader population.

A descriptive cross-sectional study conducted in an urban slum of Delhi, India, assessed maternal knowledge regarding diarrhoeal illness, its prevention, and management among 125 randomly selected mothers of under-five children using a structured questionnaire.³¹ The study found that 96% of mothers correctly defined diarrhoea, and 80% identified contaminated food and drinking water as the most common perceived causes. Although 83% believed that clean drinking water prevents diarrhoea, less than a third of the respondents could recognise critical signs of dehydration.³¹ The use of random sampling strengthened the internal validity of the study; however, its focus on a single urban slum limits the generalisability of the findings.

A cross-sectional study conducted in Pune, India, aimed to assess the knowledge and home-based management of diarrhoea among mothers of under-five children.³² The study surveyed 305 mothers attending a paediatric outpatient department and found that 77.1% knew the correct definition of diarrhoea, while 93.8% recognized the value of ORS. Knowledge about zinc supplementation was relatively low, with only 40.3% of mothers aware of its use.³² The study demonstrated generally good maternal knowledge with notable gaps in certain key areas. Strengths include the reasonable sample size and prior pilot testing of the questionnaire. However, as a hospital-based study, its findings may not fully reflect knowledge levels in the broader community.

A descriptive cross-sectional study conducted in Janakpur, Nepal, assessed the knowledge, attitudes, and practices of 113 mothers regarding diarrhoea management.³³ Using a purposive sampling technique and face-to-face interviews, the study found that 88.5% of mothers correctly defined diarrhoea as the passage of three or more loose stools in a day, and 81% were aware of

Oral Rehydration Solution (ORS) as a treatment modality. However, recognition of danger signs was low, with only 20.4% identifying dry mouth and 38.9% sunken eyes as signs of dehydration.³³ The study's small sample size and use of non-probability sampling limit the generalizability of its findings.

A descriptive cross-sectional study conducted in the Paediatric ward and OPD of Civil Hospital Karachi, Pakistan, aimed to assess maternal knowledge regarding diarrhoea.³⁴ Using convenience sampling, 200 mothers with at least one child under five were interviewed. The study found that 72% of respondents correctly defined diarrhoea as loose, watery stools. However, misconceptions were prevalent—47% attributed diarrhoea to "evil eyes," 14% to eating mud, and 10% to teething. Only 17% correctly identified contaminated water as a cause. Understanding of dehydration signs was limited, with 40% offering non-specific symptoms, 26% identifying sunken eyes, and 35% mentioning thirst and dry skin.³⁴ Although the study highlights key gaps in maternal knowledge of diarrhoeal causes and symptoms, the use of convenience sampling may reduce the generalizability of its findings.

A descriptive cross-sectional study conducted among mothers attending health centers in Aden, Yemen, aimed to assess their knowledge, attitudes, and practices regarding diarrhoea management.³⁵ Of the 500 mothers approached, 414 completed the survey. The study found that 83.1% of mothers were able to correctly define diarrhoea; however, misconceptions persisted, as 58.9% attributed diarrhoea to teething. Additionally, 42% correctly identified Oral Rehydration Solution (ORS) as the first-line treatment.³⁵ While the large sample size and use of a locally

adapted validated questionnaire are strengths, the reliance on convenience sampling may limit the generalizability of the findings.

A cross-sectional study conducted in Ethiopia in 2015 assessed maternal knowledge of diarrhoea among 232 mothers living in indigenous and resettlement communities.³⁶ The findings revealed that only 37.5% of the respondents demonstrated adequate knowledge of the causes, modes of transmission, and prevention of diarrhoea. Specifically, only 20.15% of mothers identified contaminated water as a cause, while 39.5% were able to recognise bloody stools as a danger sign.³⁶ The use of both quantitative methods and focus group discussions provided a more comprehensive understanding of the maternal knowledge landscape. However, the small sample size and limited geographic coverage constrain the generalisability of the results, underscoring the need for larger, community-wide assessments in similar settings.

A cross-sectional survey conducted in Dakar, Senegal, in 2019 assessed maternal knowledge relating to diarrhoea management among 528 mothers selected through multistage sampling.³⁷ Using a WHO-guideline-based structured questionnaire, the study found that 74% of mothers correctly defined diarrhoea as the passage of three or more loose stools per day, but only 32% were able to recognise signs of dehydration.³⁷ The study's strengths include its large sample size and systematic sampling approach. However, its findings are limited to an urban population and may not capture the knowledge levels in rural areas. Recall bias may also have influenced the accuracy of self-reported responses.

A 2023 cross-sectional study conducted in Jinja Regional Referral Hospital, Uganda, assessed caregivers' knowledge regarding diarrhoea in children.³⁸ The study involved 306 caregivers,

primarily mothers, selected through random sampling, using structured closed-ended questionnaires. The findings showed that while 91.5% of respondents were aware of Oral Rehydration Solution (ORS), only 62.1% understood its correct use in diarrhoea management. Contaminated water was identified as the primary cause by 49% of participants, while 8.5% attributed diarrhoea to supernatural causes, such as "evil spirits." Additionally, nearly half (49%) recognised "absence of tears" as a sign of dehydration.³⁸ Although the study highlights important gaps in caregiver knowledge, the reliance on self-reported data may have introduced social desirability bias, and the findings may not be fully generalisable to other regions due to cultural differences.

A 2015 community-based cross-sectional study conducted in Kano State, Nigeria, compared knowledge levels about diarrhoea among 700 caregivers from two socioeconomically distinct communities, Dorayi and Nasarawa.³⁹ The findings revealed that 75.1% of mothers in Dorayi and 78.7% in Nasarawa had good knowledge of the causes of diarrhoea. However, misconceptions were prevalent, particularly the belief that teething causes diarrhoea.³⁹ Although the study benefitted from a large sample size and inclusion of contrasting communities, the use of self-reported data raises concerns about potential recall or social desirability bias, which may affect the accuracy of the responses.

A descriptive cross-sectional study conducted in Ibadan, Nigeria, assessed awareness and knowledge of diarrhoea home management among 420 mothers using multistage random sampling.⁴⁰ The study revealed that while 92.1% of mothers had heard of Oral Rehydration Solution (ORS), only 51.4% understood its role in replacing lost body salts and fluids.

Additionally, knowledge about the appropriate timing of zinc supplementation was low.⁴⁰ The study's strengths include the use of multistage random sampling and a validated questionnaire with a Cronbach's alpha of 0.78, enhancing its reliability. However, the findings are limited in geographic scope, and self-reported data may be subject to social desirability bias.

A descriptive cross-sectional study conducted in Kosofe Local Government Area of Lagos, Nigeria, assessed the knowledge levels of 360 mothers regarding the prevention and home management of diarrhoea among under-five children using an interviewer-administered questionnaire.⁴ Approximately 59.2% of respondents demonstrated good overall knowledge, although gaps remained: only 47.8% correctly identified oral rehydration solution (ORS) as essential during diarrhoeal episodes, and just 32.2% were aware that breastfeeding should be continued during such episodes. While 70.0% recognized that washing hands without soap could contribute to diarrhoea, knowledge of correct faeces disposal and key danger signs was less consistent.⁴ The study's strengths include a systematic breakdown of knowledge components, providing insight into specific educational needs. However, its cross-sectional design and reliance on self-reported responses may limit causal inferences and introduce social desirability bias.

A 2023 descriptive cross-sectional study conducted in Ife, Nigeria, evaluated mothers' awareness and knowledge of Oral Rehydration Therapy (ORT) for managing diarrhoea among under-five children.¹⁸ Among the 80 mothers surveyed, 55% had heard of ORT, while 45% lacked any prior knowledge of its use. Furthermore, many respondents were unaware of how to prevent dehydration or where to obtain ORS packets, revealing critical knowledge gaps in diarrhoea

management.¹⁸ Although the study was hospital-based, which may have introduced selection bias by disproportionately including mothers with higher health-seeking behaviour, it highlights the pressing need for expanded community-level education on diarrhoea prevention and treatment.

2.2 Maternal Attitudes to the Management of Acute Watery Diarrhoea

Maternal attitudes play a significant role in determining the effectiveness of interventions in managing acute watery diarrhoea (AWD) in young children. Positive attitudes toward early home management, timely healthcare seeking, and adherence to recommended treatments such as oral rehydration solution (ORS) are crucial for improving health outcomes.

In the web-based cross-sectional survey conducted in Bursa, Turkey, involving 577 mothers, attitudes toward diarrhoea management were assessed using a validated instrument.³⁰ While mothers generally demonstrated high knowledge, a notable traditional attitude persisted—92.5% reported feeding bananas to their children during diarrheal episodes, irrespective of medical guidelines. This reflects a strong influence of culturally ingrained practices.³⁰ The study's large urban sample and validated tool lend strength to the findings; however, the use of snowball sampling may have introduced selection bias and excluded less educated mothers or those without internet access.

A cross-sectional study conducted in North Jakarta, Indonesia, involved 120 mothers of toddlers with a history of diarrhea.⁴¹ The study assessed maternal attitudes toward diarrhoea management and found that 66.7% of respondents demonstrated fair attitudes, reflecting moderate concern and responsiveness to diarrheal illness. Data were collected using structured questionnaires, and

random sampling was employed.⁴¹ Although the methodology was robust, the small sample size and limited geographic coverage constrain the broader applicability of the findings.

A cross-sectional study conducted in an urban slum of Delhi, India, aimed to determine the knowledge, attitude, and practice of mothers regarding diarrheal illness, its prevention, and management in children under five.³¹ Among the 125 mothers surveyed through random sampling, only 54% sought immediate medical attention, reflecting a gap in treatment-seeking attitudes.³¹ While the study's design and sampling method support internal validity, the setting in a single slum community limits the generalizability of the findings to other urban or rural populations.

Another cross-sectional study conducted in Palestine aimed to explore the relationship between maternal beliefs, knowledge, attitudes, and social influences regarding diarrhoea management.⁴² It involved 467 mothers of under-five children attending public hospitals in Hebron, Ramallah, and Nablus. The findings revealed that only 28.8% of mothers have favourable attitudes toward diarrhoea management. Additionally, 8.8% of respondents expressed concerns about continuing breastfeeding during diarrheal episodes.⁴² Although the large sample size and multi-city design enhance its strength, the hospital-based recruitment may not represent mothers who do not seek formal healthcare.

A descriptive cross-sectional study conducted in Aden, Yemen, aimed to assess maternal knowledge, attitudes, and practices related to diarrheal disease management in under-five children.³⁵ The study involved 500 mothers attending health centers and found that only 42%

recognized oral rehydration solution (ORS) as the first-line treatment, while 48.6% believed diarrhea could be managed at home. These findings highlight notable gaps in maternal attitudes toward early intervention and seeking timely medical care.³⁵ Although the study provides important insights into perceptions of diarrhoea management in a low-resource setting, the use of convenience sampling limits generalizability, and the cross-sectional design restricts causal interpretation.

A systematic review and meta-analysis focused on maternal knowledge, attitudes, and practices regarding home-based diarrhoea management across 19 studies in East Africa, comprising 7,470 participants.⁴³ The pooled prevalence of favourable attitudes toward diarrhoea management was estimated at 63.05% (95% CI: 35.7%–90.41%), indicating wide variability across study populations.⁴³ While the regional overview offers valuable context for understanding maternal attitudes across diverse settings, the significant heterogeneity among included studies and potential publication bias limit the strength of the conclusions that can be drawn.

A cross-sectional study in Dire Dawa, Eastern Ethiopia, involving 295 mothers of under-five children who had recently experienced diarrhoea, assessed maternal attitudes toward home-based management.²⁷ Using face-to-face interviews and a structured pretested questionnaire, the study found that over half of the respondents (54.9%) held negative attitudes toward managing diarrhoea at home. Specifically, 55% disagreed with the provision of oral rehydration solution (ORS) at home, 61.4% rejected the idea that mothers could effectively treat diarrhoea themselves, and 51.5% believed their children disliked the taste of ORS, which may have undermined its use.²⁷ The strength of the study lies in its systematic exploration of multiple attitudinal

dimensions; however, its cross-sectional design and reliance on self-reported data may have introduced social desirability bias, thereby limiting its ability to assess how attitudes translate into actual management behaviour over time.

Similarly, in a stratified cluster-based survey conducted across four districts in the Maradi Region of Niger—Maradi city, Madarounfa, Aguié, and Guidan Roundji—healthcare-seeking behaviours related to diarrhoea were explored among 2,940 households with children under five.⁴⁴ Of those who had experienced diarrhoea in the 27 days preceding the survey, 70.4% of caregivers sought care at health facilities, increasing to 83.8% for severe cases. Despite this, 43.4% of caregivers avoided seeking care due to beliefs that diarrhoea would resolve spontaneously, reflecting underlying conditional attitudes toward formal medical intervention.⁴⁴ While this study ensured representation across urban and rural settings, its reliance on inferred attitudinal patterns from behaviour, rather than formal psychometric evaluation, limited the depth of insight into maternal attitudes.

A cross-sectional survey conducted in urban and peri-urban Mbour, Senegal, involving 528 mothers of under-five children, examined attitudes toward diarrhoea management.³⁷ Less than half of the mothers demonstrated a proactive attitude toward early home-based care, as many delayed seeking treatment until signs of severe dehydration emerged. This reflected a relatively poor attitude toward timely management.³⁷ The study's strengths include its large sample size and systematic sampling technique, although generalizability to rural populations remains limited and recall bias may have affected responses.

A descriptive cross-sectional study in Kano State, Nigeria, compared attitudes toward home management of diarrhoea in two distinct communities—Dorayi, a densely populated low-income area, and Nasarawa G.R.A., a more affluent neighbourhood—using cluster, systematic, and random sampling to recruit 360 caregivers from each location.³⁹ Despite socioeconomic differences, caregivers in both areas shared similar attitudes regarding diarrhoea management, with over 75% in each community recognizing key causes such as contaminated water and poor hygiene, and showing comparable perceptions about appropriate home care.³⁹ The study's comparative design provided a broader understanding of contextual influences on maternal attitudes, though its cross-sectional approach and reliance on self-reported data limited the ability to assess how stable or effective these attitudes are in guiding long-term behaviour.

In the 2022 descriptive cross-sectional study conducted in Kosofe Local Government Area of Lagos, Nigeria, attitudes toward diarrhoea management were assessed using a series of nine Likert-scale statements, with responses aggregated into an overall score.⁴ Approximately 55.8% of mothers demonstrated a positive attitude, with 85.3% agreeing that diarrhoea is a serious condition capable of causing death—highlighting strong awareness of its potential severity.⁴ The structured approach to attitudinal measurement in this study allowed for the quantification of both general sentiment and specific misconceptions, offering valuable insights for public health programming. However, the reliance on self-reported responses introduces the possibility of social desirability bias, which may have led to an overestimation of positive attitudes.

2.3 Maternal Practices in the Management of Acute Watery Diarrhoea

Acute watery diarrhoea (AWD) remains a major cause of morbidity and mortality among children under five, particularly in low- and middle-income countries. Maternal practices play a critical role in mitigating the impact of AWD through early recognition, appropriate home-based management, and adherence to recommended interventions such as oral rehydration solution (ORS) and continued feeding.

A cross-sectional study conducted in Brazil in 2014 examined the diarrhoea management practices of 213 caregivers whose under-five children had recently been treated for acute diarrhoea at an emergency department.⁴⁵ The study found that 57.3% of caregivers opted to take their children directly to the hospital at the onset of diarrhoea rather than initiating home-based management. A high proportion (68.1%) administered medications to stop diarrhoea, including antibiotics or antidiarrhoeals, despite clinical guidelines discouraging their routine use. Feeding practices were also suboptimal; 63.7% of caregivers withheld solid foods during diarrhoea episodes, and a striking 92.9% believed breastfeeding should be discontinued, both of which contradict recommended guidelines promoting continued age-appropriate feeding. Although 78.4% of caregivers believed that oral rehydration solution (ORS) “cures” diarrhoea and 78.9% understood its fluid-replenishing role, only 40.8% could correctly describe its preparation.⁴⁵ The study’s strength lies in its detailed evaluation of multiple practical dimensions, but findings may be skewed due to hospital-based sampling, which may not reflect behaviours in community settings. Additionally, the reliance on self-reported responses introduces potential bias from social desirability or recall inaccuracies.

In the 2022 cross-sectional study conducted by in Bursa, Turkey, 577 mothers participated in an online survey that assessed maternal practices related to diarrhoea.³⁰ A striking finding was that 92.5% of mothers fed bananas to children during diarrhoea episodes, regardless of evidence-based guidelines.³⁰ Although the study's large sample size and the high internal consistency of the questionnaire were strengths, the use of snowball sampling introduced potential selection bias, and the online format may have excluded less tech-savvy participants.

In a cross-sectional study conducted in North Jakarta, Indonesia, researchers assessed the diarrhoea management practices of 120 mothers whose toddlers had recently experienced diarrhoea.⁴¹ Using simple random sampling and structured questionnaires, the study found that 70.8% of mothers exhibited fair practices, but significant gaps persisted in home-based care. Notably, many mothers resorted to harmful traditional practices, such as administering herbal remedies before seeking professional care and delaying health facility visits until the child's condition became more severe. Additionally, some mothers withheld food or fluids during diarrhoeal episodes, contrary to recommended guidelines.⁴¹ While the study benefited from a standardized tool and random sampling, the limited sample size and its restriction to an urban setting reduce the generalizability of its findings to broader or rural populations.

A descriptive cross-sectional study conducted in an urban slum in Delhi, India, involving 125 mothers revealed several gaps in maternal practices regarding diarrhoea management.³¹ While 76% of mothers reported using Oral Rehydration Solution (ORS) during diarrhoea episodes, only 26% considered it the primary treatment, and 36% practiced household water treatment. Continued breastfeeding was maintained by 69% of respondents, and safe stool disposal was

reported by 58%.³¹ The use of random sampling enhanced internal validity; however, the findings may have limited generalizability due to the study's confinement to a single urban slum.

A 2018 cross-sectional study conducted in Dire Dawa, Eastern Ethiopia, aimed to assess the knowledge, attitude, and practice of mothers regarding the prevention and home-based management of diarrhoeal disease in under-five children.²⁷ The study involved 295 mothers whose children had experienced diarrhoea in the preceding two weeks. Findings showed that only 42% of respondents demonstrated good practices in diarrhoea management. While nearly all mothers reported practicing appropriate handwashing—before preparing food and after defecation—only 26.1% increased breastfeeding during diarrhoea episodes, and a majority gave less than the usual amount of food and fluids.²⁷ The study's strength lies in its structured, face-to-face data collection using a pretested questionnaire, which allowed for comprehensive exploration of maternal practices. However, reliance on self-reported responses may have introduced recall or social desirability bias, limiting the accuracy of findings.

In a 2018 hospital-based cross-sectional study in Jinja District, Uganda, the purpose was to assess caregivers' knowledge, attitudes, and practices toward the management of acute diarrhoea among children aged 0–59 months.³⁸ The study recruited 306 caregivers, mostly mothers, using a structured questionnaire. Although 91.5% had heard of Oral Rehydration Solution (ORS), only 62.1% reported using it correctly. Many caregivers cited drug shops as their primary source of information rather than healthcare professionals.³⁸ The hospital-based design enabled the study to reach caregivers of symptomatic children, but this also limits its generalizability to the broader community, as facility attendees may differ in health awareness and behaviour.

A cross-sectional survey conducted in urban and peri-urban Mbour, Senegal in 2019 assessed maternal practices in the home management of acute watery diarrhoea (AWD) among 528 mothers of under-five children, using a structured questionnaire based on WHO guidelines.³⁷ The study found that less than half of the mothers could correctly prepare oral rehydration solution (ORS), and practices related to handwashing and safe water use were also found to be suboptimal.³⁷ The large sample size and systematic sampling approach were strengths of the study; however, its focus on an urban population and reliance on self-reported data introduced limitations such as recall bias and reduced generalizability to rural settings.

According to the 2023–24 Nigeria Demographic and Health Survey (NDHS), only 39% of under-five children with diarrhoea received oral rehydration therapy (ORS and/or recommended home fluids), and a mere 12% received both ORS and zinc—a World Health Organization (WHO) recommended treatment protocol.⁴⁶ These figures suggest that while awareness of ORT exists, its consistent and comprehensive application remains suboptimal among Nigerian mothers. In addition, continued feeding during diarrhoeal episodes, a practice crucial to maintaining nutritional status and promoting recovery, was not widely adhered to. The survey found that feeding practices often declined during diarrhoeal episodes, with some mothers reducing or withdrawing food due to misconceptions that it worsens the condition. The NDHS also provides insight into care-seeking behaviours. Although 67% of mothers sought treatment outside the home when their child had diarrhoea, there remained substantial reliance on informal care sources such as patent medicine vendors and pharmacies, rather than formal health facilities.

This suggests gaps in access, trust, or affordability in the formal healthcare system, especially in underserved communities.⁴⁶

Similarly, a 2015 descriptive cross-sectional study in Dorayi Quarters and Nasarawa G.R.A. in Kano State, Nigeria assessed home management practices among 720 caregivers of under-five children.³⁹ The study found that ORS usage rates were 37.6% in Dorayi and 33.1% in Nasarawa, while Salt-Sugar Solution (SSS) was used by 24.0% in both communities. Feeding practices were also assessed, with only 23.6% and 23.8% of caregivers in Dorayi and Nasarawa, respectively, continuing breastfeeding during diarrhoea episodes.³⁹ The comparative design was a strength, offering insight into intra-regional differences; however, reliance on self-reported data may have limited the depth and stability of the reported practices over time.

A 2018 cross-sectional study conducted in Kano, Nigeria, assessed maternal diarrhoea management practices among 109 women enrolled in Non-Formal Education (NFE) centers.⁴⁷ The findings revealed that while 77.1% of respondents kept ORS at home, a concerning 72% reported using sachet water—often of questionable quality—for its preparation. Despite a generally high level of awareness regarding diarrhoea prevention, preventive practices remained moderate.⁴⁷ The study's focus on a unique subpopulation of women in educational programs provides targeted insight; however, it also limits the generalizability of the results to the broader population of mothers.

A descriptive cross-sectional study conducted in Kosofe Local Government Area of Lagos, Nigeria, in 2022 assessed home management practices among 360 mothers of under-five

children.⁴ Using an 18-item questionnaire, the study found that only 53.1% of respondents demonstrated good practices. For instance, while 72.5% reported practicing exclusive breastfeeding, only 28.9% adhered to the recommended six-month duration. Additionally, although 86.7% claimed to wash hands with soap and water, just 68.9% administered ORS during diarrhoeal episodes, and nearly one-third reported relying on traditional remedies.⁴ A key strength of the study lies in its comprehensive exploration of feeding, hygiene, and fluid management practices, which offers a multifaceted view of maternal behaviour. However, its dependence on self-reported responses raises concerns about recall bias and social desirability, which may affect the accuracy of reported behaviours.

2.4 Factors Associated with Mothers' Knowledge, Attitudes, and Practices Regarding the Management of AWD

The link between maternal knowledge, attitudes, and practices (KAP) and the incidence of acute watery diarrhoea in under-five children has been established across diverse settings.

A descriptive cross-sectional study conducted in 2017 in a regional hospital in Ceará, Brazil, investigated factors associated with maternal self-efficacy in preventing childhood diarrhoea among 238 mothers of children under five.⁴⁸ Data were collected through face-to-face semi-structured interviews using a standardized sociodemographic form, a maternal knowledge questionnaire on diarrhoea prevention and management, and the validated Maternal Self-Efficacy Scale for Prevention of Childhood Diarrhoea (MSESPCD). The analysis revealed that several socioeconomic variables were significantly linked to higher levels of maternal self-efficacy; for example, family income ($p = 0.049$), the age of the child ($p = 0.010$), the type of

house construction (with brick and plaster showing better outcomes, $p = 0.042$), waste disposal method ($p = 0.037$), sewage type ($p = 0.016$), and the type of toilet used ($p = 0.006$) all had statistically significant associations. Moreover, specific components of maternal knowledge were influential; mothers who correctly identified factors such as heat ($p = 0.021$) and dentition ($p = 0.030$) as risk factors for diarrhoea demonstrated higher self-efficacy. In addition, certain preventive behaviours—particularly maintaining home hygiene ($p = 0.023$) and proper breastfeeding practices ($p = 0.028$)—were also associated with elevated maternal self-efficacy scores.⁴⁸ A notable strength of the study is its comprehensive approach, which combined socioeconomic, knowledge, and behavioural dimensions using a rigorously validated instrument. However, because the sample was drawn by convenience from mothers whose children were hospitalized, the findings might not be fully generalizable to all mothers, especially those who do not use hospital services.

The cross-sectional study conducted in Bursa, Turkey, in 2022 also examined the relationship between maternal education and knowledge of childhood diarrhoea among 577 mothers of under-five children, recruited through a snowball sampling technique via online platforms.³⁰ Data were collected using a validated self-administered questionnaire with a 26-item knowledge scale (Cronbach's $\alpha = 0.827$), complemented by items on cultural and traditional practices. While the study did not directly assess diarrhoea incidence, it revealed a statistically significant association ($p < 0.001$) between higher maternal education and improved knowledge scores, as well as a greater likelihood of adopting evidence-based diarrhoea management practices such as ORT use. Mothers with lower education levels demonstrated increased reliance on traditional home remedies—such as feeding bananas (92.5%)—and were less likely to recognize

dehydration signs, indirectly linking lower knowledge levels to a higher risk of diarrhoeal morbidity in children.³⁰ While the study benefits from a large sample size and strong instrument validity, its snowball sampling approach and web-based format limit generalisability, especially to mothers with lower digital literacy or those in rural and resource-limited settings.

A cross-sectional study conducted in 2019 in Maseru, Lesotho, involving 458 mothers (299 urban, 159 rural), assessed maternal knowledge and practices using a structured questionnaire.⁴⁹ The study revealed significantly higher levels of good knowledge (77.9%) and good practice (67.9%) among urban mothers compared to rural mothers, where only 63.5% demonstrated good knowledge and 49.1% demonstrated good practices ($p = 0.000$). Notably, 64.5% of urban respondents identified ORS or sugar-salt solution (SSS) as the first-line response to diarrhoea, whereas only 8.2% of rural mothers did so. In contrast, 91.8% of rural respondents opted to visit health centres first, suggesting a greater reliance on formal healthcare and highlighting the influence of geographic and socio-environmental context on diarrhoea management behaviour.⁴⁹ The large sample size and urban–rural comparison strengthen the study’s relevance, though its facility-based sampling limits generalisability to non-attending populations.

In 2019, a descriptive cross-sectional study conducted in Samaru, Kaduna State, Nigeria, involved 350 mothers of under-five children selected via multistage sampling to examine home management of diarrhoea.⁶ The study found that, among the various sociodemographic attributes examined, the age of the mother emerged as a statistically significant determinant of HMD practice (with younger mothers being more inclined to practice appropriate home management), while educational status and occupation were not significant predictors. The study also noted that

hospitals and health facilities were the main sources of ORS information (48.3%), followed by social interactions (23.1%) and mass media (21.7%), suggesting that exposure to formal health education plays a key role in shaping practices.⁶ Although the study benefits from a robust sampling method and a high response rate (95.63%), its reliance on self-reported practices and its cross-sectional design limit causal inferences regarding the underlying barriers to optimal HMD implementation.

In 2022, a descriptive cross-sectional study conducted in Kosofe Local Government Area of Lagos, Nigeria, examined the socio-demographic factors associated with maternal knowledge, attitude, and practices regarding the prevention and home management of diarrhoea among under-five children.⁴ The study utilized multivariate analysis and found that mothers with more than six years of education, those who were employed, and those who were married were significantly more likely to exhibit good knowledge, positive attitudes, and appropriate home management practices. Specifically, higher educational attainment was linked to increased odds of good knowledge (OR = 4.52, $p < 0.001$), while being married was significantly associated with both positive attitudes (OR = 1.84, $p = 0.034$) and improved practices (OR = 2.03, $p = 0.015$).⁴ A notable strength of this study lies in its robust analytical approach, which highlighted the role of key socio-demographic variables in shaping maternal behaviours. However, its cross-sectional design precludes causal inference, and its focus on an urban population may limit the applicability of the findings to mothers in rural or less advantaged areas.

Together, these studies indicate that while maternal awareness is necessary, it is insufficient on its own. Effective diarrhoea prevention and management in the home is deeply influenced by a

combination of knowledge, attitudes toward the illness, and practical ability—each shaped by contextual factors such as socioeconomic status, education, and access to information.

2.5 Barriers Faced by Mothers in Accessing Healthcare Services for the Management of AWD in children under five

Barriers to healthcare access for the management of diarrheal disease are multi-layered, spanning infrastructural, economic, cultural, and informational domains.

In a 2012 qualitative study conducted in Morang District, Nepal, researchers employed two focus group discussions and eight in-depth interviews with a total of 20 mothers to explore socio-cultural barriers to diarrhoea management.⁵⁰ Many participants attributed diarrhoea to supernatural or traditional causes and expressed reluctance to use biomedical treatments for conditions they perceived as spiritual in origin. For instance, when diarrhoea was linked to teething or “cold,” home remedies such as applying ash to gums or oil massages were preferred over oral rehydration therapy (ORT). Socioeconomic constraints also emerged as key barriers: 80% of participants had no formal education, and 75% earned less than US\$61 per month, reflecting compounded vulnerabilities in access to healthcare.⁵⁰ While the study’s qualitative approach enabled a deep cultural understanding of care barriers, its small sample size and purposive sampling design limit the generalizability of the findings.

Similarly, the 2011 cross-sectional survey in the Maradi Region of Niger revealed multifaceted barriers to healthcare-seeking during childhood diarrhoeal episodes.⁴⁴ Among caregivers who did not seek formal care, 43.4% cited spontaneous recovery, 15.8% relied on pharmacies, 13.1% were hindered by financial limitations, and others reported logistical challenges such as long

distances (6.2%) or competing responsibilities (5.6%). Cultural perceptions also influenced decisions, with 3.1% of respondents viewing diarrhoea as a normal condition or attributing it to teething.⁴⁴ The use of open-ended questions allowed for the identification of economic, geographic, cultural, and informational barriers; however, the absence of qualitative tools like interviews limited the study's ability to capture deeper contextual influences on caregiver decision-making.

In the cross-sectional study conducted in Lesotho in 2019, disparities in access to diarrhoea-related healthcare between urban and rural mothers were underscored in a 2019 study involving 458 respondents.⁴⁹ Despite the fact that 91.8% of rural mothers reported visiting health centres, only 5.7% could correctly mix oral rehydration solution (ORS), in stark contrast to 64.9% of their urban counterparts. Nearly all rural mothers (98.1%) were unemployed, and the lack of regular income constituted a substantial barrier to effective healthcare utilization. These findings suggest that structural poverty—rather than mere lack of awareness—may play a dominant role in limiting both home-based management and timely access to care.⁴⁹ The large sample size and urban–rural comparison strengthen the study's relevance, though its facility-based sampling limits generalisability to non-attending populations.

In 2020, a case-control study in Arba Minch, Ethiopia investigated the determinants of delay in seeking care for diarrhoeal disease among 400 mothers of under-five children using systematic random sampling and structured interviews.⁵¹ The study revealed that maternal education significantly impacted timely health-seeking behaviour: mothers with no formal education were 6.9 times more likely to delay care (AOR = 6.90, 95% CI: 3.10–15.37), while those with only

primary education were 3.12 times more likely to delay (AOR = 3.12, 95% CI: 1.44–6.73) compared to mothers with higher education. Other significant predictors included low household wealth index (AOR = 2.81 for poorest category), negative experiences with health care professionals, and poor satisfaction with past visits (AOR = 0.29 for those who were satisfied). Mothers of female children and children under 24 months were also more likely to delay care.⁵¹ The study's strength lies in its robust statistical analysis and clear operational definitions; however, its facility-based design may not fully capture the experiences of caregivers who never reached a health facility.

A 2024 multicountry study based on Demographic and Health Survey (DHS) data from 35 sub-Saharan African countries examined healthcare-seeking behaviour (HSB) for diarrhoea in children under five, identifying key individual and contextual barriers to timely care.⁵² The analysis showed that mothers who did not perceive distance as a problem were 1.05 times more likely to seek care, indicating that geographic proximity to health facilities remains a significant determinant. Additionally, lower maternal education and household wealth were strong individual-level predictors of poor health-seeking behaviour. On a broader scale, country-level factors also played a role: children in lower-middle-income countries were 5% less likely to receive care compared to those in low-income countries. Furthermore, maternal engagement with antenatal and postnatal care services was positively associated with prompt care-seeking during diarrhoeal episodes.⁵² The broad geographic scope and robust statistical modelling enhance the study's generalizability across sub-Saharan Africa, though its reliance on secondary data may limit insights into specific local barriers—such as those unique to urban Nigerian settings like Benin City.

A cross-sectional study conducted in 2024 in the North Gondar Zone of Northwest Ethiopia aimed to examine the factors associated with delayed care-seeking among caregivers of under-five children experiencing diarrhoea.⁵³ Using multistage cluster sampling, the study involved 610 mothers selected from both rural and urban settings. Data were collected via structured questionnaires, and delay in seeking care was defined as not seeking treatment within 24 hours of symptom onset. The study found that 59.3% of caregivers delayed seeking medical help, with the mean delay period being 3.08 ± 2.1 days. Key predictors of delay included low maternal education—caregivers with no formal education were 2.9 times more likely to delay seeking care compared to those with tertiary education (AOR = 2.9; 95% CI: 1.5–5.6)—and low household income.⁵³ The study’s strength lies in its large, representative sample and robust statistical analysis. However, recall bias and the cross-sectional design limit causality inference.

In underserved regions of Kenya, Nigeria, and Niger, a qualitative study conducted in 2014 explored the demand-side barriers to care-seeking for diarrhoea, pneumonia, and malaria among caregivers.⁵⁴ The study was carried out in Homa Bay (Kenya), Kebbi and Cross River (Nigeria), and Maradi and Tillabéri (Niger), and involved 156 participants, including 65 in-depth interviews with caregivers and multiple focus group discussions with fathers and healthcare workers. The study identified five key categories of barriers: financial barriers, geographical inaccessibility, socio-cultural and gender dynamics, knowledge and information gaps, and health facility deterrents. Financial constraints were particularly pronounced despite policies for free child healthcare. For example, in Nigeria, caregivers often had to purchase drugs due to frequent stock-outs, pay for tests and supplies, and contend with informal fees at facilities. In one tragic

case, a child died en route to the hospital because the family could not afford earlier treatment. Distance to facilities was another notable challenge, particularly in Niger and Kenya, where mothers had to walk long distances carrying their sick children. Cultural beliefs also affected care-seeking: in Nigeria, the practice of *kulle* restricted women's mobility, effectively placing the responsibility for seeking care on fathers who may be less involved in day-to-day caregiving. Health facility-related deterrents included poor staff attitudes, long waiting times, and drug shortages. In Kenya and Niger, mothers reported being turned away due to lack of medicine, and in Nigeria, negative interactions with healthcare staff were widespread. The strength of this study lies in its broad geographic scope and participatory approach, which elicited locally acceptable solutions. Suggestions from participants included ensuring consistent drug supply, implementing community funds for emergencies, sensitising men and religious leaders, and empowering women socially and economically.⁵⁴ However, the qualitative design means that findings are context-specific and may not be generalisable beyond the selected study sites.

A cross-sectional mixed-methods study in Oyo State, Nigeria, conducted in 2022, identified key barriers to the utilisation of oral rehydration solution (ORS) and zinc for diarrhoea management.⁵⁵ The study involved 1154 mothers selected through a three-stage cluster sampling technique (wards, communities, and households). Complementing this quantitative component, the qualitative arm included key informant interviews with one government senior staff member and two paediatricians, alongside two focus group discussions with nine mothers/guardians each. Among the 1154 mothers surveyed, only 71 (6.2%) reported recent diarrhoea episodes in their children. Of these, just 41 (57.7%) used ORS/zinc—a figure significantly lower than the 70.6% global average and even below Nigeria's own average of 34% reported elsewhere. The study

highlighted key barriers to ORS/zinc utilisation, including unavailability (47 cases), unaffordability (56 cases), and poor awareness (6 cases). Additional barriers cited in the qualitative interviews included lack of spousal approval (16 cases), which underscored the socio-cultural dimensions of health-seeking behaviour. Furthermore, while key informants asserted that ORS/zinc was freely available in public hospitals, FGD participants contradicted this, reporting frequent unavailability and uncertainty about where to obtain the treatment.⁵⁵ A major strength of this study lies in its mixed-methods design, which enriched the quantitative findings with nuanced qualitative insights. The inclusion of key health stakeholders and real-world community participants added credibility and depth to the analysis. However, a notable limitation is the relatively low number of diarrhoea cases (71) identified out of 1154 respondents, which may have constrained the breadth of conclusions about ORS/zinc utilisation behaviours. Additionally, regional specificity to Oyo State limits generalisability to other Nigerian contexts.

Further illuminating these barriers, a comprehensive doctoral study carried out in 2024 in Northwestern Nigeria applied a systems-thinking approach to explore how maternal beliefs and community-level dynamics affect WASH (Water, Sanitation and Hygiene) and diarrhoea-related care-seeking behavior.⁵⁶ Using stratified multistage sampling and ecosystem mapping among households with under-two children, the study identified maternal ideations—such as fear, worry, and misconceptions about treatment—as critical barriers. Even when ORS and zinc were available at nearby facilities, usage remained low due to misunderstandings about diarrhoea causation, especially among poorer households. This gap between infrastructure and maternal behaviour underscored the importance of psychosocial and cultural influences alongside physical access.⁵⁶

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study was conducted in Benin City, the administrative capital of Edo State, Nigeria. Edo State is one of the 36 states in Nigeria; located in the South-South geopolitical zone. Its capital is Benin City and it has 18 LGAs. The state was created in 1991 from the Northern portion of the defunct Bendel State and has a land mass of about 19, 743 square kilometres. It lies geographically between latitudes 6°23'55"N to 6°27'39"N and longitude 5°36'18"E to 5°44'18"E and is bounded by Kogi State to the North-East, Anambra State to the East, Delta State to the South-South and Ondo State to the West and North-West.⁵⁷ It had a population of 3,233,366 as of the 2006 census and a projected population to 2022 of 4,777,042 at a growth rate of 2.5%.⁵⁸ Geographically, Benin City is located in the southern part of Edo State between latitudes 6°16'N and 6°33'N and longitudes 5°31'E and 5°45'E. Administratively, the city comprises five Local Government Areas (LGAs): Oredo, Egor, Ikpoba-Okha, Ovia North-East, and Umunwonde.⁵⁹

Benin City functions as a major urban centre in southern Nigeria and is characterized by a diverse population engaged in various occupations, including trading, civil service, artisanal work, and informal employment. The average age of mothers in the region ranges between 26 and 39 years,⁶⁰ and literacy rates vary across different parts of the city, often depending on urban versus peri-urban status.

In terms of healthcare infrastructure, the city hosts a substantial number of facilities, with an estimated 445 healthcare centres serving its population. This includes 148 public primary

healthcare centres (PHCs) and 223 private PHCs, underscoring the city's strategic health service capacity.⁵⁹ The combined population of the study area—covering Oredo, Egor, Ikpoba-Okha, Ovia North-East, and Uhunmwonde in 2006 was 1,314,333 and it is projected to be approximately 2,214,643 in 2025, based on a 2.7% annual growth rate from the 2006 census figures.^{58, 61} The predominant languages are English, Bini and Pidgin.

3.2 Study Design

This study employed a descriptive cross-sectional design.

3.3 Study Population

The study population comprised mothers of children under the age of five years who reside in selected LGAs of Benin City.

3.4 Inclusion and Exclusion Criteria

Inclusion Criteria:

1. Mothers aged 18 years and above.
2. Mothers who had at least one child under five years of age.
3. Mothers who had resided in the selected communities for a minimum of six months.
4. Mothers who provided informed consent to participate in the study.
5. Mothers who were available and willing to complete the interview during the data collection period.

Exclusion Criteria:

1. Mothers who had a known history of cognitive impairment or mental illness that may impair their ability to respond to questions.

3.5 Study Duration

The study spanned a duration of 13 months; from February 2025 to May 2026.

(See Gantt Chart in **Appendix V**)

3.6 Sample Size Determination

The sample size was determined using Cochran's formula:

$$n = Z^2 \cdot p \cdot q / d^2$$

Where:

$Z = 1.96$ (standard normal deviate at 95% confidence level)

p = prevalence or proportion of the population with a characteristic of interest (59.8% proportion of Mothers with good knowledge of diarrhoea and its management in a study done in Lagos State,

Nigeria)⁴ = 0.598

$$q = 1 - p(40.2\%) = 0.402$$

$$d = 0.05 \text{ (margin of error)}$$

Therefore, $n = [1.96^2 * 0.598 * 0.402] / 0.05$

$$= [3.8416 * 0.598 * 0.402] / 0.0025$$

$$= [0.924] / 0.0025$$

$$= 369.6$$

$$n = 370$$

Accounting for non-response (nr); 10% and a design effect of 1.5, the final sample size was calculated thus;

$$nf = [n / (1 - nr)] \cdot DE$$

n = minimum sample size (370)

nr= non-response rate (10% = 0.10)

e = design effect (1.5)

nf = final sample size

$$nf = [370/(1-0.10)] * 1.5$$

$$nf = [370/0.9] * 1.5$$

$$nf = 411.11 * 1.5$$

$$nf = 616.66$$

$$nf = 617$$

The final sample size used for this study was 617.

3.7 Sampling Technique

A multistage sampling technique was employed to ensure adequate representation across Benin City's core and peripheral local government areas. The sampling process proceeded as follows:

Stage 1: Selection of Local Government Areas (LGAs)

For the purpose of this study, two Local Government Areas (LGAs) in Benin City were selected to capture the diversity of maternal knowledge, attitudes, and practices across different

geographic and socio-economic settings. To achieve this, all five LGAs in the Benin City metropolitan area (Egor, Oredo, Ikpoba-Okha, Ovia North East, and Uhunmwonde) were listed, and a simple random sampling technique by balloting was employed to select two LGAs (Egor and Ovia North East) as the study sites.

Stage 2: Selection of Wards

After selecting Egor and Ovia North East LGAs, the next stage involved the identification and selection of wards within each LGA. Egor LGA comprises ten political wards,⁵⁸ while Ovia North East LGA has thirteen wards(see list in appendix III).⁵⁸

From each LGA, two wards were selected using simple random sampling by balloting (Ugbowo and Uwelu from Egor LGA, Oluku and Okada East in Ovia North East LGA). The selected wards formed the basis for the subsequent sampling stages of the study. These four wards formed the basis for the subsequent sampling stages of the study.

Stage 3: Selection of Streets

From each of the four selected wards—Ugbowo and Uwelu in Egor LGA, and Oluku and Okada East in Ovia North East LGA—a list of streets was obtained from the respective Local Government Development Authorities. Ten (10) streets were selected from each ward using simple random sampling by balloting.

Stage 4: Selection of Households

In each of the 10 selected streets per ward, sixteen houses were selected using systematic sampling to contribute to a total sample size of 617 respondents across the 40 selected streets.

This number of households was determined by dividing the required sample size of 617 respondents by the 40 selected streets, yielding approximately 15.4 households per street, rounded to 16 to ensure sufficient eligible respondents while accounting for potential non-response or ineligibility. The total number of houses on the street will be estimated through observation or inquiry, and this number will be divided by 16 to determine the sampling interval (k). A random starting point between 1 and k was chosen, and every kth house was selected subsequently until 16 houses were obtained per street.

If a selected house had no eligible household (i.e., no mother of a child under five), the next immediate house was visited until an eligible respondent was found.

Stage 5: Selection of Respondents

In each selected household, only one eligible respondent—defined as a mother with at least one child under the age of five—was interviewed. In cases where more than one eligible respondent is present in a household, one was selected using simple random sampling by balloting. If no eligible respondent is found in a household, the next immediate household within the same building was approached. Where no eligible household exists in a selected house, the next house was visited, and this process was continued until a respondent is identified, ensuring that the required number of respondents per street is achieved.

3.8 Data Collection Tool

A structured interviewer-administered questionnaire was used to collect data from respondents. The questionnaire was adapted from standardized sources, including the WHO/UNICEF guidelines on diarrhoeal disease management,⁶⁰ the 2023-24 Nigeria Demographic and Health

Survey (NDHS)¹² and previously validated tools used in peer-reviewed studies on maternal knowledge, attitudes, and practices (KAP) regarding diarrhoea.^{4, 25, 40}

The questionnaire was developed in English to ensure respondent comprehension. It was pretested and modified based on findings from the pretesting.

The questionnaire was then divided into five key sections:

Section A: Socio-Demographic Information

This section collected data on: age, marital status, level of education, occupation, religion, household size, monthly income, source of water and sanitation facilities

Section B: Knowledge of Diarrhoea

This section assessed maternal knowledge regarding:

- i. Definition and causes of acute watery diarrhoea
- ii. Modes of transmission
- iii. Signs and symptoms (e.g., dehydration signs)
- iv. Appropriate treatment methods (e.g., ORS, zinc)
- v. Prevention methods (e.g., WASH, breastfeeding, vaccination)

Responses were scored using a binary system (correct/incorrect), and categorized into adequate and inadequate knowledge levels.

Section C: Attitudes Toward Diarrhoea Management

This section evaluated maternal perceptions and beliefs related to:

- i. The seriousness of diarrhoea

- ii. The use of ORS and zinc
- iii. Continued feeding and breastfeeding during episodes
- iv. The need for health facility visits
- v. Cultural beliefs and home remedies

A 5-point Likert scale (strongly agree to strongly disagree) was used, and attitude scores were classified as positive or negative.

Section D: Practices in Diarrhoea Management

This section assessed both the management and preventive practices of mothers or caregivers in relation to acute watery diarrhoea in under-five children. It captured specific actions taken during recent diarrhoeal episodes (where applicable), as well as routine behaviours aimed at preventing diarrhoea.

The section explored the following key practice domains:

- i. Actions taken during a child's diarrhoeal episode
- ii. Use and preparation of oral rehydration salts (ORS) and zinc supplements
- iii. Feeding and fluid intake practices during diarrhoea
- iv. Health-seeking behaviours and sources of treatment
- v. Preventive measures, including hygiene and sanitation practices

Responses included yes/no, multiple-choice, and open-ended formats and were scored to categorize practice levels as good or poor.

Section E: Barriers to Care

This section identified:

- i. Economic barriers (e.g., cost of transportation, treatment)
- ii. Geographical barriers (e.g., distance to health facility)
- iii. Cultural barriers (e.g., needing spousal permission)
- iv. Health system-related barriers (e.g., long wait times, poor attitude of health workers)
- v. Awareness barriers (e.g., not knowing where to go)

These were assessed using binary responses (yes/no) and categorized for analysis.

3.9 Training of Research Assistants

Five research assistants were trained to implement the study's sampling methodology in the selected wards of Ugbowo, Uwelu, Oluku, and Okada East. They were 400L medical students currently studying in the University of Benin. The training covered mapping and screening households on 10 selected streets per ward to identify eligible respondents (mothers with a child under five), systematic sampling was applied to select approximately 16 households per street, and simple random sampling by balloting to choose one respondent per household. Assistants were trained on asking questions using clear, neutral, and culturally sensitive interview techniques to ensure accurate responses. Training also included ethical practices, such as obtaining informed consent and protecting respondent privacy. The training was conducted over

two days by the principal investigators and included both theoretical sessions and practical fieldwork simulations.

3.10 Pretesting

The questionnaire was pretested among mothers of under-five children Idogbo community, located in Ikpoba-Okha LGA, Benin City, Edo State. This community was chosen because it shared similar socio-demographic characteristics with the selected study areas but is not included in the main sample. Approximately ten percent (10%) of the final sample size—about 62 respondents—was used for the pretesting exercise. Feedbacks from the process were used to identify ambiguous or confusing questions, and necessary modifications were made accordingly. Internal consistency of the attitude and practice sections was evaluated using Cronbach's alpha.

3.11 Data Collection Procedure

Data was collected through face-to-face interviews conducted by trained research assistants fluent in English and local languages. Interviews were conducted at the respondents' homes or other convenient locations, ensuring privacy and comfort.

3.12 Method of Data Analysis

Data collected from structured interviews with 617 respondents (mothers with at least one child under five) across the selected wards of Ugbowo, Uwelu, Oluku, and Okada East was entered into the Statistical Package for the Social Sciences (SPSS, Version 26). Data entry involved inputting responses from questionnaires into a pre-designed SPSS database, with each

respondent's data assigned a unique identifier to ensure anonymity. Data cleaning was performed to check for missing values, outliers, and inconsistencies, using frequency checks and cross-tabulations to ensure accuracy.

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize key variables, such as maternal knowledge, attitudes, and practices regarding child health, as well as demographic characteristics (e.g., age, education, household size). These statistics provided an overview of the sample's characteristics and the distribution of responses, facilitating a clear understanding of the study population.

Inferential statistics was employed to test associations between variables. Chi-square tests was used to examine relationships between categorical variables, such as the association between maternal education level and knowledge of child health practices. Logistic regression was applied to assess the predictors of specific outcomes, such as the likelihood of adopting recommended health practices based on maternal knowledge, attitudes, and demographic factors. All statistical tests used a significance level of $p < 0.05$ to determine the statistical significance of findings. The choice of these methods is based on their suitability for analyzing categorical and binary outcome data commonly encountered in public health research, ensuring robust evaluation of the study's objectives. Results were presented in tables and figures to enhance clarity and interpretation.

3.13 Measurement of Variables and Scoring

To assess respondents' knowledge, attitudes, and practices (KAP) regarding the management of acute watery diarrhoea in children under five, a scoring system was applied to the responses

collected through the questionnaire. Each section of the questionnaire had its own scoring approach based on the type and format of the questions.

Knowledge Scoring

The knowledge section of the questionnaire (Section B) consisted of 11 main items, some of which allowed for multiple correct responses. A total of 24 correct responses were possible across the section. Each correct response was awarded one (1) point, while incorrect or "Don't know" responses will be scored zero (0). The cumulative score for each respondent was then computed.

Respondents were categorized based on their total knowledge score into two levels:

Adequate knowledge: 12–24 points ($\geq 50\%$)

Inadequate knowledge: <12 points (<50%)

Attitude Scoring

Section C of the questionnaire assessed mothers' attitudes toward the management of acute watery diarrhoea in under-five children. This section consisted of 12 attitude statements, comprising both positively and negatively worded items. Respondents were required to indicate their level of agreement with each statement using a 5-point Likert scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Scoring was applied as follows:

- i. Positively worded statements will be scored directly, with Strongly Agree assigned 5 points and Strongly Disagree assigned 1 point.
- ii. Negatively worded statements will be reverse-scored, with Strongly Agree assigned 1 point and Strongly Disagree assigned 5 points.

This scoring system ensured that higher scores reflected more favourable (positive) attitudes toward appropriate diarrhoea management.

Each respondent's total attitude score was obtained by summing the scores from all 12 items. The minimum possible score was 12 (12×1), and the maximum possible score was 60 (12×5).

For categorization, a 60% cut-off point⁴ of the maximum score was used to classify respondents into two groups:

Positive Attitude: Total score ≥ 36

Negative Attitude: Total score < 36

Practice Scoring

Section D of the questionnaire assessed respondents' practices regarding the management and prevention of acute watery diarrhoea in under-five children. The section was divided into two parts. Section D.2 focused on management practices and was answered only by respondents whose children have experienced acute watery diarrhoea in the twelve months preceding the survey. Section D.3 assessed preventive practices and was answered by all respondents, regardless of whether their child has had a recent episode of diarrhoea.

Each appropriate or recommended practice was awarded one (1) mark, while inappropriate, harmful, or absent practices will receive a score of zero (0). Some questions with multiple correct options will contribute more than one point to the total score. For respondents who answer both Section D.2 and D.3, the maximum possible score will be 21. For those who skip Section D.2 (due to lack of a recent diarrhoeal episode) and respond only to Section D.3, the maximum obtainable score will be 8.

Practice scores will be categorized as follows:

For respondents who complete Sections D.2 and D.3:

Good practice: Total score ≥ 16

Poor practice: Total score < 16

For respondents who complete only Section D.3:

Good practice: Total score ≥ 6

Poor practice: Total score < 6

3.14 Ethical Considerations

Ethical approval was obtained from the appropriate University of Benin Teaching Hospital Health Research Ethics Committee. Permission was also sought from relevant Local Government and community authorities. Informed consent was obtained from each participant after explaining the study's purpose, procedures, risks, and benefits. Participation was voluntary, and respondents were assured of confidentiality and the right to withdraw at any time without consequences.

3.15 Limitations of the Study

The study relies on self-reported information, which may be subject to social desirability and recall bias, particularly in questions related to diarrhoea management practices. This was mitigated by the use of simple, clearly worded questions and interviewer clarification during data collection. The cross-sectional design limited causal inference, and findings may not be generalizable beyond the selected LGAs in Benin City. Additionally, cultural sensitivities may have influenced participants' willingness to fully disclose traditional practices.

3.16 Benefits of the Study

1. The findings provided policymakers and health planners with evidence-based data to guide targeted interventions for diarrhoea control in under-five children.
2. Insights from the study informed the development of more effective, culturally appropriate health education programs for mothers and caregivers.
3. Identification of knowledge and practice gaps led to strengthening maternal health education at PHCs, improving early and effective home management of diarrhoea.

4. The study added to the limited body of research on maternal KAP in diarrhoea management within urban and peri-urban Nigerian settings, particularly in Benin City.
5. Data from the study can be used to design behaviour change strategies aimed at improving maternal responses during diarrhoeal episodes.
6. The results served as a useful reference point for researchers interested in child health, maternal practices, and diarrhoea prevention and control.
7. By identifying modifiable maternal behaviours, the study has the potential to indirectly reduce morbidity and mortality related to diarrhoea among children under five.
8. Ultimately, the study could empower mothers with the right information to make better health decisions for their children.

CHAPTER FOUR

RESULTS

Six hundred and thirty-one (631) respondents participated in the study with a response rate of 100%. The results were divided into sections as follows:

Section A: Socio-demographic characteristics of respondents

Section B: Respondents' knowledge of causes, symptoms and home management of acute watery diarrhoea in under-five children

Section C: Respondents' attitude towards the management of acute watery diarrhoea in under-five children

Section D: Home management practices of respondents in managing acute watery diarrhoea in under-five children

Section E: Barriers faced by mothers in Benin City in accessing healthcare services for the management of acute watery diarrhoea in children under five.

SECTION A
SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1a: Socio-Demographic characteristics of Respondents

Variable	Frequency (n = 631)	Percent
Age Group (years)		
<20	13	2.1
20–29	204	32.2
30–39	365	57.6
≥40	49	8.2
Mean Age ± S.D	31.6 ± 5.2	
Marital Status		
Married	548	86.8
Single	51	8.1
Divorced	16	2.5
Separated	16	2.5
Level of Education		
No Formal education	20	3.2
Primary	21	3.3
Secondary	262	41.5
Tertiary	328	52.0
Employment Status		
Employed	556	88.1
Unemployed	75	11.9
Skill Level		
Skill level 1	0	0.0
Skill level 2	48	7.6
Skill level 3	419	66.3
Skill level 4	56	8.9
Skill level 5	30	4.8
Skill level 6	78	12.4
Religion		
Christianity	605	95.9
Islam	25	4.0
African Traditional Religion	1	0.2

Over half 365 (57.6%) of respondents were in the 30–39 age group, with a mean age of 31.6 ± 5.2 years. Majority 548 (86.8%) were married. Over half 328 (52.0%) had tertiary education. Majority 556 (88.1%) were unemployed. A higher proportion 419 (66.3%) were in skill level 3 occupations. Majority 605 (95.9%) were Christians.

Table 1b: Socio-Demographic Characteristics of Respondents

Variables	Frequency (n = 631)	Percent
Ethnic Group		
Benin	272	43.1
Esan	91	14.4
Urhobo	58	9.2
Yoruba	51	8.1
Afemai	49	7.8
Igbo	46	7.3
Ibibio	32	5.1
Ika	18	2.9
Others*	14	2.3
Household Income (₦)		
<90000	156	24.7
90,000 – 250,000	297	47.1
≥250,000	178	28.2
Mean Income ± S.D	₦185301.1 ± ₦146437.3	
Median Income (IQR)	₦150000	

Others – Tiv(7), Ukwuani(6), Hausa/Fulani(1)

IQR – Interquartile Range

A higher proportion 272 (43.1%) of respondents were of Benin ethnicity. Nearly half 297 (47.1%) of households earned between ₦90,000 and ₦250,000, with a mean monthly income of ₦185,301.1 ± ₦146,437.3 and a median of ₦150,000. Household income was predominantly ₦90,000–₦250,000, reported by 297 (47.1%), followed by ≥₦250,000 with 178 (28.2%) and <₦90,000 with 156 (24.7%). The mean household income was ₦185,301.1 ± 146,437.3, with a median of ₦150,000.

Table 2: Characteristics of U-5 Children in Respondent Households

Variables	Frequency (n = 631)	Percent
Number of U – 5 Children		
1	370	58.6
2	210	33.3
3	51	8.1
Age Group (months)		
<12	75	11.9
12 – 35	385	61.0
36 – 59	171	27.1
Mean Age(in months) ± S.D	26.1 ± 12.5	
Sex of Index Child		
Male	374	59.3
Female	257	40.7

Majority 370 (58.6%) of households had one under- five child, while the least proportion, 51 (8.1%) had three. Over half 385 (61.0%) of index children were aged 12–35 months, and the least proportion 75 (11.9%) were below 12 months. The mean age was 26.1 ± 12.5 months. A higher proportion 374 (59.3%) of index children were male, while 257 (40.7%) were female.

Table 3: Household Characteristics of Respondents

Variables	Frequency (n = 631)	Percent
Main Source of Water*		
Borehole	564	89.4
Protected Well	58	9.2
Piped water	21	3.3
Unprotected Well	1	0.2
Surface Water	1	0.2
Kind of Toilet Facility		
Flush Toilet	617	97.8
Pit Latrine with Slab	12	1.9
Pit Latrine	2	0.3
Source of Health Information*		
Health Worker	476	75.4
Internet	215	34.1
Radio/TV	192	30.4
Family	156	24.7
None	14	2.2

* - Multiple Response Question

The main source of water was borehole, reported by 564 (89.4%) households, followed by protected well 58 (9.2%) and piped water 21 (3.3%). Only 1 (0.2%) household each reported using unprotected well or surface water.

Almost all respondents reported using flush toilets, 617 (97.8%), while a small minority used pit latrines with slab, 12 (1.9%), or simple pit latrines, 2 (0.3%).

Health information was predominantly obtained from health workers, 476 (75.4%). Other sources included the internet, 215 (34.1%), radio/television, 192 (30.4%), and family members, 156 (24.7%). Only 14 (2.2%) respondents reported having no source of health information.

SECTION B

RESPONDENTS' KNOWLEDGE OF CAUSES, SYMPTOMS AND HOME MANAGEMENT OF ACUTE WATERY DIARRHEA IN U-5 CHILDREN

Table 4a: Respondents' knowledge of causes and symptoms of acute watery diarrhoea in under-five children

Knowledge Domains	Frequency (n = 631)	Percent
Definition of Diarrhoea		
Passage of watery stools three or more times a day	514	81.5
Passage of loose stools once a day	105	16.6
Don't know	12	1.9
Source of Information about Diarrhoea*		
Health Worker	423	67.0
Internet	176	27.9
Family	176	27.9
None	14	2.5
Radio	5	0.9
School	4	0.7
Specific Causes of Diarrhoea in Children*		
Contaminated food or water	534	84.6
Dirty hands	443	70.2
Poor sanitation	398	63.1
Germs/viruses	323	51.2
Teething	281	44.5
Evil spirits	5	0.8
Too much use of antibiotics	2	0.4
Sugary foods	1	0.2
Don't know	1	0.2
Methods of Identifying Diarrhoea in Children		
Frequent stools(three or more times a day)	376	59.6
Watery stools	170	26.9
Abdominal pain	7	1.1
Lethargy	2	0.3
All of the above	76	12.0
Danger Signs in a Child With Diarrhoea*		
Sunken eyes	527	83.5
Inability to drink	246	39.0
No tears when crying	202	32.0
Fast breathing	173	27.4
Unsure	1	0.2

* - Multiple response Question (MRQ)

Majority 514 (81.5%) of respondents correctly defined diarrhoea as the passage of watery stools three or more times a day, while the least proportion 12 (1.9%) did not know. About two-thirds

423 (67.0%) obtained information about diarrhoea from health workers, 176 (27.9%) from the internet, 176 (27.9%) from family, and the least proportion 4 (0.7%) from school.

Over four-fifths 534 (84.6%) identified contaminated food or water as a cause of diarrhoea in children, 443 (70.2%) mentioned dirty hands, 398 (63.1%) poor sanitation, and 323 (51.2%) germs or viruses. Less than half 281 (44.5%) attributed it to teething, while the least proportions 5 (0.8%) and below mentioned evil spirits, antibiotics, or sugary foods.

Nearly three-fifths 376 (59.6%) recognized frequent stools as a method of identifying diarrhoea in children, 170 (26.9%) watery stools, and the least proportion 2 (0.3%) lethargy. About one-eighth 76 (12.0%) mentioned all of the above. Majority 527 (83.5%) identified sunken eyes as a danger sign in a child with diarrhoea, 246 (39.0%) inability to drink, 202 (32.0%) absence of tears when crying, and 173 (27.4%) fast breathing, while the least proportion 1 (0.2%) were unsure.

Table 4b: Respondents' knowledge of causes and symptoms of acute watery diarrhoea in under-five children

Knowledge Domains	Frequency(n = 631)	Percent
Signs of Dehydration in a Child with Diarrhoea*		
Crying without tears	317	50.2
Dry mouth	287	45.5
Sunken eyes	46	7.3
Lethargy / Unconsciousness	26	4.1
Cold hands or feet	26	4.1
Unsure	3	0.5
Complications Associated with Diarrhoea*		
Dehydration	492	78.0
Death	466	73.9
Delayed growth	133	21.1
Don't know	40	6.4

* - Multiple Response Question(MRQ)

About half 317 (50.2%) of respondents identified crying without tears as the main sign of dehydration in a child with diarrhoea, while the least proportion 3 (0.5%) were unsure. Majority 492 (78.0%) recognized dehydration as a complication associated with diarrhoea, while the least proportion 40 (6.4%) did not know any complication.

Table 5: Respondents' knowledge of home management of acute watery diarrhoea in U-5 Children

Variables	Frequency	Percent
Methods of Treating Diarrhoea in Children (n = 631)*		
Oral Rehydration Solution (ORS)	428	67.8
Medical consultation	419	66.4
Zinc tablets	222	35.2
Home remedies	160	25.4
Don't know	34	5.4
Timing for Treating Diarrhoea (n = 631)		
Immediately	540	85.6
After 1–2 days	77	12.2
Only when the child becomes weak	14	2.2
Aware of Oral Rehydration Solution (n = 631)	503	79.7
Purpose of ORS (n = 503)		
To cure diarrhoea	277	55.1
To replace lost fluids	209	41.6
Don't know	17	3.3
Duration of ORS use After Preparation (n = 503)		
12 hours	93	14.7
24 hours	292	46.3
48 hours	32	5.1
Don't know	85	13.5
Ingredients used in ORS Preparation (n = 503)		
Salt, Sugar and Water	299	59.4
Salt and Water	65	12.9
Sugar and Water	27	5.4
7up Drink and Salt	12	2.4
Andrew Liver Salt	5	1.0
Other	3	0.6
Don't Know	95	18.9
Other – Water only, Chicken soup and water		

* - Multiple Response Question(MRQ)

Majority 428 (67.8%) of respondents reported using Oral Rehydration Solution (ORS) to treat diarrhoea in children, while 419 (66.4%) sought medical consultation. The least proportion 34

(5.4%) did not know any method. Most 540 (85.6%) stated that treatment should begin immediately, while the least proportion 14 (2.2%) would treat only when the child becomes weak. Awareness of oral rehydration solution was reported by 503 (79.7%).

Over half 277 (55.1%) believed the purpose of ORS was to cure diarrhoea, while the least proportion 17 (3.3%) did not know. Nearly half 292 (46.3%) reported that ORS should be used within 24 hours of preparation, while the least proportion 32 (5.1%) mentioned 48 hours. Majority 299 (59.4%) correctly identified salt, sugar, and water as the ingredients for ORS preparation.

Table 6: Respondents' overall knowledge of home management of acute watery diarrhoea

Variable	Frequency (n = 631)	Percent
Overall Knowledge		
Adequate	471	74.7
Inadequate	160	25.3
AWD – Acute Watery Diarrhoea		

Overall, knowledge of home management of acute watery diarrhoea among respondents was found to be adequate in 471 (74.7%) and inadequate in 160 (25.3%).

Table 7: Association between socio-demographic characteristics and respondents' knowledge of home management of acute watery diarrhoea

Variable	Knowledge Freq (%)		Test Statistic χ^2	p-value
	Adequate(n = 471)	Inadequate(n = 160)		
Age Group (Years)			1.898	0.387
< 30	159 (73.3)	58 (26.7)		
≥ 30	312 (75.4)	102 (24.6)		
Marital Status			19.285	<0.001
Married	408 (74.5)	140 (25.5)		
Not Married	63 (75.9)	20 (24.1)		
Education Level			57.437	<0.001
None	6 (30.0)	14 (70.0)		
Primary	8 (38.1)	13 (61.9)		
Secondary	180 (68.7)	82 (31.3)		
Tertiary	277 (84.5)	51 (15.5)		
Employment Status			1.268	0.260
Employed	419 (75.4)	137 (24.6)		
Unemployed	52 (69.3)	23 (30.7)		
Skill Level			11.047	0.026
Skill Level 2	41 (85.4)	7 (14.6)		
Skill Level 3	310 (74.0)	109 (26.0)		
Skill Level 4	47 (83.9)	9 (16.1)		
Skill Level 5	17 (56.7)	13 (43.3)		
Skill Level 6	56 (71.8)	22 (28.2)		
Income (₦)				
< 150000	233 (76.1)	73 (23.9)	3.519	0.172
≥ 150000	238 (73.2)	87 (26.8)		
Religion				
Christianity	451 (74.5)	154 (25.5)	0.367*	0.832
Islam	19 (76.0)	6 (24.0)		
ATR	1 (100.0)	0 (0.0)		

χ^2 – Chi square *- Fischer's Exact

Majority 312 (75.4%) of respondents aged ≥ 30 years had adequate knowledge compared to 159 (73.3%) of those aged < 30 years. The association between age group and knowledge was not statistically significant ($\chi^2 = 1.898$; $p = 0.387$).

Most 408 (74.5%) of married respondents had adequate knowledge compared to 63 (75.9%) of those not married. The association between marital status and knowledge was statistically significant ($\chi^2 = 19.285$; $p < 0.001$).

A higher proportion 277 (84.5%) of respondents with tertiary education had adequate knowledge compared to 180 (68.7%) with secondary education. The least proportion 6 (30.0%) of those with no education had adequate knowledge. The association between education level and knowledge was statistically significant ($\chi^2 = 57.437$; $p < 0.001$).

Most 419 (75.4%) of unemployed respondents had adequate knowledge compared to 52 (69.3%) of those employed. The association between employment status and knowledge was not statistically significant ($\chi^2 = 1.268$; $p = 0.260$).

A higher proportion 310 (74.0%) of respondents at skill level 3 had adequate knowledge compared to other skill levels, while the least proportion 17 (56.7%) at skill level 5 had adequate knowledge. The association between skill level and knowledge was statistically significant ($\chi^2 = 11.047$; $p = 0.026$).

Almost equal proportions of respondents with income $< \text{₦}150,000$ (233; 76.1%) and $\geq \text{₦}150,000$ (238; 73.2%) had adequate knowledge. The association between income and knowledge was not statistically significant ($\chi^2 = 3.519$; $p = 0.172$).

Most 451 (74.5%) of Christian respondents had adequate knowledge compared to 19 (76.0%) of Muslims. The least proportion 1 (100.0%) of those practicing ATR had adequate knowledge. The association between religion and knowledge was not statistically significant ($\chi^2 = 0.367$; $p = 0.832$).

Table 8: Association between characteristics of U-5 children and respondents' knowledge of home management of acute watery diarrhoea

Variable	Knowledge Freq (%)		Test Statistic χ^2	p-value
	Adequate (n = 471)	Inadequate (n = 160)		
No. of U-5 children				
1	289 (78.1)	81 (21.9)	7.194	0.027
2	143 (68.1)	67 (31.9)		
3	39 (76.5)	12 (23.5)		
Sex of Index Child				
Male	263 (70.3)	111 (29.7)	9.065	0.003
Female	208 (80.9)	49 (19.1)		
Age of Index Child(months)				
<12	56 (74.7)	19 (25.3)	640.855	<0.001
12 – 35	275 (71.4)	110 (28.6)		
36 – 59	140 (81.9)	31 (18.1)		

χ^2 – Chi square *- Fischer's Exact

Majority 289 (78.1%) of respondents with one under-five child had adequate knowledge compared to 143 (68.1%) of those with two children. The least proportion 39 (76.5%) of those with three children had adequate knowledge. The association between number of under-five children and knowledge was statistically significant ($\chi^2 = 7.194$; $p = 0.027$).

Most 263 (70.3%) of respondents whose index child was male had adequate knowledge compared to 208 (80.9%) of those whose index child was female. The association between sex of index child and knowledge was statistically significant ($\chi^2 = 9.065$; $p = 0.003$).

A higher proportion 140 (81.9%) of respondents whose index child was aged 36–59 months had adequate knowledge compared to 275 (71.4%) of those aged 12–35 months. The least proportion 56 (74.7%) of those aged < 12 months had adequate knowledge. The association between age of index child and knowledge was statistically significant ($\chi^2 = 640.855$; $p < 0.001$).

Table 9a: Predictors of knowledge of home management of acute watery diarrhoea

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age of respondent	-0.003	0.997	0.955	1.040	0.880
Marital Status					
Not Married*		1			
Married	-0.868	5.498	0.203	0.867	0.019
Level of Education					
None*		1			
Primary	2.590	13.335	4.285	41.502	<0.001
Secondary	2.524	12.475	4.324	35.990	<0.001
Tertiary	0.859	2.360	1.471	3.787	<0.001
Employment Status					
Employed*		1			
Unemployed	-0.216	0.806	0.208	3.118	0.754
Skill level					
Skill level 2	-0.019	0.981	0.197	4.890	0.982
Skill level 3	0.056	1.058	0.272	4.111	0.936
Skill level 4	-0.052	0.950	0.200	4.503	0.948
Skill level 5	0.537	1.710	0.377	7.768	0.487
Skill level 6*		1			
No of Children < 5					
1	0.141	1.151	0.521	2.545	0.728
2	0.462	1.587	0.704	3.576	0.265
3*		1			

* - Reference category; R square = 11.9 – 17.5%

Marital status was a statistically significant predictor of knowledge (OR = 0.867; 95% CI = 0.203–0.867; $p = 0.019$). Married respondents were less likely to have inadequate knowledge compared to those not married.

Education level was also a statistically significant predictor. Respondents with primary education were over 13 times more likely to have adequate knowledge compared to those with no education (OR = 13.335; 95% CI = 4.285–41.502; $p < 0.001$). Similarly, those with secondary education were about 12 times more likely (OR = 12.475; 95% CI = 4.324–35.990; $p < 0.001$), while those with tertiary education were more than twice as likely (OR = 2.360; 95% CI = 1.471–3.787; $p < 0.001$).

Other variables including age of respondent, employment status, skill level, and number of under-five children were not statistically significant predictors of knowledge.

Table 9b: Predictors of knowledge of diarrhoea amongst respondents

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Sex of Index Child					
Male*		1			
Female	0.569	1.767	1.155	2.705	0.009
Household Income (₦)					
<150000		1			
≥150000	0.333	1.395	0.911	2.136	0.125
Age of index child (months)	-0.023	0.978	0.960	0.995	0.013

* - Reference category; R square = 11.9 – 17.5%

Sex of the index child was a statistically significant predictor of knowledge (OR = 1.767; 95% CI = 1.155–2.705; $p = 0.009$). Respondents whose index child was female were 76.7% more likely to have adequate knowledge compared to those whose index child was male.

Age of the index child was also a statistically significant predictor (OR = 0.978; 95% CI = 0.960–0.995; $p = 0.013$). Respondents were 2.2% less likely to have adequate knowledge as the age of the index child increased.

Household income was not a statistically significant predictor of knowledge (OR = 1.395; 95% CI = 0.911–2.136; $p = 0.125$).

SECTION C

**RESPONDENTS' ATTITUDE TOWARDS HOME MANAGEMENT OF ACUTE
WATERY DIARRHEA IN UNDER-FIVE CHILDREN**

Table 10: Respondents' Attitude towards Home Management of Acute Watery Diarrhoea

Statement	SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)
Diarrhoea is a serious illness that can cause death in under-five children	10 (1.6)	27 (4.3)	41 (6.5)	283 (44.8)	270 (42.8)
Diarrhoea can be managed effectively at home	23 (3.6)	73 (11.6)	141 (22.3)	238 (37.7)	156 (24.7)
Herbal medicine is better than hospital treatment for diarrhoea	194 (30.7)	278 (44.1)	113 (17.9)	41 (6.5)	5 (0.8)
Giving fluids during diarrhoea makes the child vomit more	66 (10.5)	184 (29.2)	149 (23.6)	198 (31.4)	34 (5.4)
Continued feeding during diarrhoea is important	8 (1.3)	57 (9.0)	92 (14.6)	355 (56.3)	119 (18.9)
Teething causes diarrhoea in children	24 (3.8)	98 (15.5)	154 (24.4)	293 (46.4)	62 (9.8)
Seeking medical care early is necessary	4 (0.6)	7 (1.1)	49 (7.8)	352 (55.8)	219 (34.7)
ORS is effective in treating diarrhoea	5 (0.8)	15 (2.4)	119 (18.9)	348 (55.2)	144 (22.8)
I am confident in managing diarrhoea at home	31 (4.9)	176 (27.9)	98 (15.5)	246 (39.0)	80 (12.7)
Diarrhoea is a normal part of child growth and does not need treatment	231 (36.6)	291 (46.1)	63 (10.0)	34 (5.4)	12 (1.9)
Diarrhoea caused by teething does not require medical attention	182 (28.8)	281 (44.5)	121 (19.2)	41 (6.5)	6 (1.0)
ORS should only be given if the child has severe diarrhoea	123 (19.5)	223 (35.3)	149 (23.6)	117 (18.5)	19 (3.0)

(n = 631); SD – Strongly Disagree; D – Disagree; N – Neutral; A – Agree; SA – Strongly Agree

Most respondents agreed that diarrhoea is a serious illness that can cause death in under- five children, with 283 (44.8%) agreeing and 270 (42.8%) strongly agreeing. Only 10 (1.6%) strongly disagreed, while 27 (4.3%) disagreed and 41 (6.5%) were neutral.

A majority also believed diarrhoea can be managed effectively at home, with 238 (37.7%) agreeing and 156 (24.7%) strongly agreeing. However, 73 (11.6%) disagreed and 23 (3.6%) strongly disagreed, while 141 (22.3%) were neutral.

Most respondents rejected the idea that herbal medicine is better than hospital treatment, with 194 (30.7%) strongly disagreeing and 278 (44.1%) disagreeing. Only 41 (6.5%) agreed and 5 (0.8%) strongly agreed, while 113 (17.9%) were neutral.

Opinions were mixed on whether giving fluids during diarrhoea makes the child vomit more: 198 (31.4%) agreed and 34 (5.4%) strongly agreed, while 184 (29.2%) disagreed and 66 (10.5%) strongly disagreed. About 149 (23.6%) were neutral.

Most respondents recognized the importance of continued feeding during diarrhoea, with 355 (56.3%) agreeing and 119 (18.9%) strongly agreeing. Only 8 (1.3%) strongly disagreed, 57 (9.0%) disagreed, and 92 (14.6%) were neutral.

Teething was widely perceived as a cause of diarrhoea, with 293 (46.4%) agreeing and 62 (9.8%) strongly agreeing. However, 98 (15.5%) disagreed, 24 (3.8%) strongly disagreed, and 154 (24.4%) were neutral.

Seeking medical care early was strongly supported, with 352 (55.8%) agreeing and 219 (34.7%) strongly agreeing. Very few respondents disagreed (7, 1.1%) or strongly disagreed (4, 0.6%).

Most respondents agreed that ORS is effective in treating diarrhoea, with 348 (55.2%) agreeing and 144 (22.8%) strongly agreeing. Only 5 (0.8%) strongly disagreed, 15 (2.4%) disagreed, and 119 (18.9%) were neutral.

Confidence in managing diarrhoea at home was moderate, with 246 (39.0%) agreeing and 80 (12.7%) strongly agreeing. However, 176 (27.9%) disagreed, 31 (4.9%) strongly disagreed, and 98 (15.5%) were neutral.

Most respondents disagreed that diarrhoea is a normal part of child growth and does not need treatment, with 231 (36.6%) strongly disagreeing and 291 (46.1%) disagreeing. Only 34 (5.4%) agreed, 12 (1.9%) strongly agreed, and 63 (10.0%) were neutral.

Similarly, most respondents disagreed that diarrhoea caused by teething does not require medical attention, with 182 (28.8%) strongly disagreeing and 281 (44.5%) disagreeing. Only 41 (6.5%) agreed, 6 (1.0%) strongly agreed, and 121 (19.2%) were neutral.

Finally, most respondents disagreed that ORS should only be given if the child has severe diarrhoea, with 123 (19.5%) strongly disagreeing and 223 (35.3%) disagreeing. However, 117 (18.5%) agreed, 19 (3.0%) strongly agreed, and 149 (23.6%) were neutral.

Table 11: Overall Attitude Towards Home Management of Acute Watery Diarrhoea in Under- Five Children

Variable	Frequency (n = 631)	Percent
Overall Attitude		
Negative	134	21.2
Positive	497	78.8

Most 497 (78.8%) of respondents had a positive attitude towards management of Acute Watery Diarrhoea (AWD)

Table 12a: Association between socio-demographic characteristics and respondents' attitudes towards home management of acute watery diarrhoea

Variable	Attitude Towards Diarrhoea Management Freq (%)		Test Statistic	p- value
	Positive Attitude (n=497)	Negative Attitude (n=134)	χ^2	
Age Group (years)				
<30	159 (73.3)	58 (26.7)	7.546	0.023
≥30	338 (81.1)	76 (18.9)		
Marital Status			20.127	<0.001
Married	435 (79.4)	113 (20.6)		
Not Married	62 (72.1)	21 (27.9)		
Education Level			106.088	<0.01
No Formal Education	5 (25.0)	15 (75.0)		
Primary	10 (47.6)	11 (52.4)		
Secondary	177 (67.6)	85 (32.4)		
Tertiary	305 (93.4)	23 (6.6)		
Employment Status			0.000	0.983
Employed	438 (78.0)	118 (22.0)		
Unemployed	59 (78.7)	16 (21.3)		
Skill Level			11.729	0.019
Level 2	43 (89.6)	5 (10.4)		
Level 3	319 (76.1)	100 (23.9)		
Level 4	51 (91.1)	5 (8.9)		
Level 5	21 (70.0)	9 (30.0)		
Level 6	63 (80.8)	15 (19.2)		
Religion			6.424*	0.024
Christianity	481 (79.5)	124 (20.5)		
Islam	16 (64.0)	9 (36.0)		
African Traditional	0 (0.0)	1 (100.0)		

χ^2 – Chi square *- Fischer's Exact

Majority 338 (81.1%) of respondents aged ≥ 30 years had a positive attitude towards diarrhea management compared to 159 (73.3%) of those aged < 30 years. The association between age group and attitude was statistically significant ($\chi^2 = 7.546$; $p = 0.023$).

Most 435 (79.4%) of married respondents had a positive attitude compared to 62 (72.1%) of those not married. The association between marital status and attitude was statistically significant ($\chi^2 = 20.127$; $p < 0.001$).

A higher proportion 305 (93.4%) of respondents with tertiary education had a positive attitude compared to 177 (67.6%) with secondary education. The least proportion 5 (25.0%) of those with no formal education had a positive attitude. The association between education level and attitude was statistically significant ($\chi^2 = 106.088$; $p < 0.01$).

Most 438 (78.0%) of unemployed respondents had a positive attitude compared to 59 (78.7%) of those employed. The association between employment status and attitude was not statistically significant ($\chi^2 = 0.000$; $p = 0.983$).

A higher proportion 51 (91.1%) of respondents at skill level 4 had a positive attitude compared to other skill levels, while the least proportion 21 (70.0%) at skill level 5 had a positive attitude. The association between skill level and attitude was statistically significant ($\chi^2 = 11.729$; $p = 0.019$).

Most 481 (79.5%) of Christian respondents had a positive attitude compared to 16 (64.0%) of Muslims. The association between religion and attitude was statistically significant ($\chi^2 = 6.424$; $p = 0.024$).

Table 12b: Association between socio-demographic characteristics and respondents' attitudes towards home management of acute watery diarrhoea

Variable	Attitude Towards Diarrhoea Management Freq (%)		Test Statistic	p- value
	Positive Attitude (n=497)	Negative Attitude (n=134)	χ^2	
Household Income (₦)				
<150000	238 (77.8)	68 (22.2)	3.158	0.206
≥150000	259 (79.9)	66 (20.1)		
No. of U-5 Children			1.607	0.448
1 child	286 (77.3)	84 (22.7)		
2 children	168 (80.0)	42 (20.0)		
3 children	43 (84.3)	8 (15.7)		
Age of Index Child (months)				
< 12	57 (76.0)	18 (24.0)	6.144	0.046
12 – 35	294 (76.4)	91 (23.6)		
36 – 59	146 (85.4)	25 (14.6)		
Sex of Index Child			2.887	0.093
Male	286 (76.5)	88 (23.5)		
Female	211 (82.1)	46 (17.9)		
Level of Knowledge				
Adequate	411 (87.3)	60 (12.7)	80.184	<0.001
Inadequate	86 (53.7)	74 (46.3)		

χ^2 – Chi square *- Fischer's Exact

A higher proportion 146 (85.4%) of respondents whose index child was aged 36–59 months had a positive attitude compared to 294 (76.4%) of those aged 12–35 months. The least proportion 57 (76.0%) of those aged < 12 months had a positive attitude. The association between age of index child and attitude was statistically significant ($\chi^2 = 6.144$; $p = 0.046$).

A higher proportion 411 (87.3%) of respondents with adequate knowledge had a positive attitude compared to 86 (53.7%) of those with inadequate knowledge. The association between knowledge level and attitude was statistically significant ($\chi^2 = 80.184$; $p < 0.001$).

Associations between household income, number of under- five children, and sex of index child with attitude were not statistically significant.

Table 13a: Predictors of attitude towards management of diarrhoea amongst respondents

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age of respondent	0.031	1.031	0.983	1.081	0.208
Marital Status					
Not Married*		1			
Married	0.650	1.916	0.901	4.078	0.091
Level of Education					
None	-4.205	0.015	0.004	0.060	<0.001
Primary	-3.142	0.043	0.013	0.144	<0.001
Secondary	-2.163	0.115	0.059	0.225	<0.001
Tertiary*		1			
Employment Status					
Employed		1			
Unemployed	-0.059	0.938	0.255	4.409	0.936
Skill level					
Skill level 2	-1.780	0.169	0.025	1.127	0.066
Skill level 3	-0.964	0.382	0.082	1.783	0.221
Skill level 4	-1.073	0.342	0.052	2.257	0.265
Skill level 5	0.018	1.018	0.179	5.785	0.984
Skill level 6*		1			
No of Children < 5					
1	-0.619	0.539	0.194	1.497	0.235
2	0.369	1.446	0.504	4.150	0.493
3*		1			

CI = Confidence interval; OR = Odd ratio; *reference category; R square = 18.4 – 28.6%

Education level was a statistically significant predictor of attitude towards diarrhoea management. Respondents with no formal education were 98.5% less likely to have a positive attitude compared to those with tertiary education (OR = 0.015; 95% CI = 0.004–0.060; $p < 0.001$). Similarly, those with primary education were 95.7% less likely (OR = 0.043; 95% CI = 0.013–0.144; $p < 0.001$), while those with secondary education were 88.5% less likely (OR = 0.115; 95% CI = 0.059–0.225; $p < 0.001$).

Other variables including age of respondent, marital status, employment status, skill level, and number of under-five children were not statistically significant predictors of attitude towards diarrhoea management.

Table 13b: Predictors of attitude towards management of diarrhoea amongst respondents

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Sex of Index Child					
Male*		1			
Female	0.009	1.192	0.724	1.960	0.490
Household Income (₦)					
<150000*		1			
≥150000	-0.343	0.710	0.442	1.140	0.156
Age of index child	0.020	1.016	1.000	1.041	0.046
Level of Knowledge					
Inadequate*		1			
Adequate	1.508	4.516	2.778	7.339	<0.001

CI = Confidence interval; OR = Odd ratio; *reference category

R square = 18.4 – 28.6%

Level of knowledge was a statistically significant predictor of attitude towards diarrhoea management. Respondents with adequate knowledge were more than four times more likely to have a positive attitude compared to those with inadequate knowledge (OR = 4.516; 95% CI = 2.778–7.339; $p < 0.001$).

Age of the index child was also a statistically significant predictor (OR = 1.016; 95% CI = 1.000–1.041; $p = 0.046$). Respondents were 1.6% more likely to have a positive attitude as the age of the index child increased.

Other variables including sex of index child, household income, marital status, age of respondent, employment status, skill level, and number of under-five children were not statistically significant predictors of attitude towards diarrhoea management.

SECTION D

PRACTICES OF RESPONDENTS IN HOME MANAGEMENT OF ACUTE WATERY

DIARRHOEA IN UNDER-FIVE CHILDREN

Table 14a: Respondents' Practices in the Home Management of Diarrhoea in U-5 Children

Variables	Frequency	Percent
Occurrence of Diarrhoea in Last 12 months (n = 631)	328	52.0
Number of diarrhoea episodes in past 12 months (n = 328)		
1	180	54.9
2	111	33.8
3	31	9.5
4	4	1.2
5	1	0.3
Duration of most recent episode (n = 328)		
Less than 1 day	57	17.4
1–3 days	196	59.8
4–7 days	58	17.7
>7 days	13	4.0
Don't know	4	1.2
First Action Taken During Episode (n = 328)		
Gave ORS	114	34.8
Took child to health facility	83	25.3
Gave home remedies (SSS, herbal)	63	19.2
Took child to pharmacy/chemist	60	18.3
Took child to traditional healer	5	1.5
Did nothing	3	0.9
ORS Use During Diarrhoea Episode (n = 328)	246	75.0

More than half 328 (52.0%) of respondents reported that their child had experienced diarrhoea in the last 12 months. Among these, the majority 180 (54.9%) had one episode, followed by 111 (33.8%) with two episodes. The least proportions were those with four episodes 4 (1.2%) and five episodes 1 (0.3%).

For the most recent episode, most 196 (59.8%) lasted 1–3 days, while 58 (17.7%) lasted 4–7 days. The least proportions were episodes lasting more than 7 days 13 (4.0%) and those lasting less than 1 day 57 (17.4%).

The first action taken during diarrhoea episodes was giving ORS in 114 (34.8%) cases, followed by taking the child to a health facility 83 (25.3%). Other actions included home remedies 63 (19.2%), taking the child to a pharmacy/chemist 60 (18.3%), while the least proportions were taking the child to a traditional healer 5 (1.5%) or doing nothing 3 (0.9%).

Overall, most 246 (75.0%) of respondents reported using ORS during diarrhoea episodes.

Table 14b: Respondents' Practices in the Home Management of Diarrhoea in U-5 Children

Variables	Frequency	Percent
ORS Preparation Methods (n = 246)		
1 sachet + 1L water	90	36.6
Pharmacy/chemist prepared	40	16.3
½ bottle water + 1 sachet	40	16.3
1 keg water + 1 sachet	26	10.6
Health facility prepared	25	10.2
Homemade SSS (salt + sugar + water)	19	7.7
Soft drink + salt + sugar	11	4.4
Premixed ORS (ready- to- drink)	10	4.1
Others	6	2.4
Zinc Supplementation use During Diarrheal Episode (n = 328)	137	41.8
Duration of Zinc Supplementation (n = 137)		
<5 days	60	43.8
5–10 days	65	47.4
≥10 days	10	7.3
Don't know	2	1.5
Medicines given during episode (n = 328)*		
Antibiotics (e.g., metronidazole, amoxicillin)	194	30.7
Antimotility drugs (e.g., loperamide)	35	5.5
Herbal or traditional medicines	21	3.3
None of the above	208	33.0
Source of Medicines Used (n = 328)*		
Pharmacy/Chemist	203	32.2
Not Applicable	170	26.9
Hospital/Clinic	156	24.7
Traditional Healer	17	2.7
Neighbor/Family	12	1.9
Market	6	1.0

* - Multiple Response Question

Others – 1 sachet of ORS in 1 L of water and a bottle of 7up

Among respondents who reported ORS preparation methods, the majority 90 (36.6%) prepared it correctly using one sachet in one litre of water. Other common methods included pharmacy/chemist preparation 40 (16.3%) and half bottle of water plus one sachet 40 (16.3%).

Less frequent methods were one keg of water plus one sachet 26 (10.6%), health facility preparation 25 (10.2%), homemade sugar- salt solution 19 (7.7%), soft drink plus salt and sugar 11 (4.4%), premixed ORS 10 (4.1%), and others 6 (2.4%).

Zinc supplementation was reported in 137 (41.8%) diarrhoeal episodes. Of these, most 65 (47.4%) lasted 5–10 days, followed by 60 (43.8%) less than 5 days. The least proportions were ≥ 10 days 10 (7.3%) and those who did not know 2 (1.5%).

Regarding medicines given during diarrhoea episodes, antibiotics were most common 194 (30.7%), followed by antimotility drugs 35 (5.5%) and herbal/traditional medicines 21 (3.3%). A substantial proportion 208 (33.0%) reported none of the above.

The main source of medicines was pharmacy/chemist 203 (32.2%), followed by hospital/clinic 156 (24.7%). Fewer respondents obtained medicines from traditional healers 17 (2.7%), neighbors/family 12 (1.9%), or the market 6 (1.0%).

Table 14c: Respondents' Practices in the Home Management of Diarrhoea in U-5 Children

Variables	Frequency	Percent
Source of Advice/Treatment for Child's Diarrhoea (n = 328)*		
Pharmacy/Chemist	284	86.6
Hospital/Clinic	254	77.7
Family/Friends	45	13.7
Traditional Healer/Herbalist	19	5.8
Community Health Worker	10	3.0
Internet Browsing	2	0.6
Time Interval Before Visiting Hospital (n = 254)		
1–2 days	117	46.1
Same day	45	17.7
3–5 days	87	34.3
More than 5 days	5	2.0
Feeding Practices During Diarrhoea Episode (n = 328)*		
Continued giving food as usual	208	63.4
Continued breastfeeding as usual	120	36.6
Reduced food	86	26.2
Increased breastfeeding	46	14.0
Increased food	40	12.2
Reduced breastfeeding	39	11.9
Increased fluids (water, juice)	15	4.5
Reduced fluids	6	1.8
Stopped breastfeeding	5	1.5
Stopped giving food or fluids	2	0.6

* - MRQ

The main source of advice or treatment for childhood diarrhoea was pharmacy/chemist 284 (86.6%), followed by hospital/clinic 254 (77.7%). Other sources included family/friends 45 (13.7%), traditional healers/herbalists 19 (5.8%), community health workers 10 (3.0%), and internet browsing 2 (0.6%).

Among those who visited hospitals, most 117 (46.1%) did so within 1–2 days, while 87 (34.3%) waited 3–5 days. The least proportions sought care on the same day 45 (17.7%) or after more than 5 days 5 (2.0%).

Regarding feeding practices during diarrhoea episodes, the majority 208 (63.4%) continued giving food as usual, while 120 (36.6%) continued breastfeeding. Other practices included reducing food 86 (26.2%), increasing breastfeeding 46 (14.0%), increasing food 40 (12.2%), reducing breastfeeding 39 (11.9%), increasing fluids 15 (4.5%), reducing fluids 6 (1.8%), stopping breastfeeding 5 (1.5%), and stopping food or fluids 2 (0.6%).

Table 15: Respondents' Practices in the Prevention of Diarrhoea in U-5 Children

Variables	Frequency(n = 631)	Percent
Preventive Practices Against Childhood Diarrhoea*		
Exclusive breastfeeding for first 6 months	335	53.1
Handwashing with soap before feeding child	474	75.1
Handwashing with soap after changing diapers	375	59.4
Proper disposal of feces (toilet/latrine)	281	44.5
Boiling or treating drinking water	142	22.5
Ensuring child receives rotavirus vaccine	188	29.8
Nothing specific	26	4.1
Designated Handwashing Area at Home	525	83.2
Rotavirus Vaccination Status of Under- Five Children		
Yes	346	54.8
No	146	23.1
Don't know	139	22.0
Usual Disposal of Child's Feces		
Toilet/Latrine	443	70.2
Dustbin/Gutter	115	18.2
Open disposal (bush, etc.)	58	9.2
Burn/Bury (combined)	15	2.4

* - MRQ

Preventive practices against childhood diarrhoea were common among respondents. The majority 474 (75.1%) reported handwashing with soap before feeding the child, followed by handwashing after changing diapers 375 (59.4%) and exclusive breastfeeding for the first six months 335 (53.1%). Other practices included proper disposal of feces 281 (44.5%), rotavirus vaccination 188 (29.8%), and boiling/treating drinking water 142 (22.5%). Only 26 (4.1%) reported doing nothing specific.

Most households 525 (83.2%) had a designated handwashing area.

Regarding rotavirus vaccination status, more than half 346 (54.8%) of under-five children had received the vaccine, while 146 (23.1%) had not and 139 (22.0%) respondents did not know.

For disposal of child's feces, the majority 443 (70.2%) used toilets/latrines, while 115 (18.2%) disposed in dustbins/gutters. The least proportions reported open disposal 58 (9.2%) or burning/burying 15 (2.4%).

Table 16: Overall Practice Towards the Home Management of Acute Watery Diarrhoea in Under- Five Children

Variable	Frequency (n = 631)	Percent
Practice		
Good Practice	206	32.6
Poor Practice	425	67.4

Overall, a majority 425 (67.4%) of respondents demonstrated poor practice, while only 206 (32.6%) had good practice.

Table 17a: Association between socio-demographic characteristics and respondents' practices in the home management and prevention of Acute watery diarrhoea

Variable	Maternal Home Management Practices Freq (%)		Test Statistic	p- value
	Good Practice (n=206)	Poor Practice (n=425)	χ^2	
Age Group (years)			0.749	0.387
< 30	66(30.4)	151 (69.6)		
≥ 30	140(33.8)	274 (66.2)		
Marital Status				
Not Married	20 (24.1)	63 (75.9)	3.177	0.075
Married	186 (33.9)	362 (66.1)		
Education Level				
No Formal Education	1 (5.0)	19 (95.0)	22.687*	<0.001
Primary	0 (0.0)	21 (100.0)		
Secondary	88 (33.6)	174 (66.4)		
Tertiary	117 (35.7)	211 (64.3)		
Employment Status				
Employed	188 (33.8)	368 (66.2)	2.894	0.089
Unemployed	18 (24.0)	57 (76.0)		
Skill Level				
Level 2	14 (29.2)	34 (70.8)	11.358	0.023
Level 3	152 (36.3)	267 (63.7)		
Level 4	16 (28.6)	40 (71.4)		
Level 5	3 (10.0)	27 (90.0)		
Level 6	21 (26.9)	57 (73.1)		
Income			0.127	0.721
< 150000	102 (33.3)	204 (66.7)		
≥150000	104 (32.0)	221 (68.0)		

*Fischer's Exact χ^2 = chi square

A slightly higher proportion 66 (30.4%) of mothers aged below 30 years demonstrated good practice compared to 140 (33.8%) of those aged 30 years and above. The association between age group and maternal home management practices was not statistically significant ($\chi^2 = 0.749$; $p = 0.387$).

Majority 186 (33.9%) of married mothers had good practice compared to 20 (24.1%) of those not married. The association between marital status and maternal home management practices was not statistically significant ($\chi^2 = 3.177$; $p = 0.075$).

Only 1 (5.0%) of mothers with no formal education and none of those with primary education demonstrated good practice, compared to 88 (33.6%) of those with secondary education and 117 (35.7%) of those with tertiary education. The association between education level and maternal home management practices was statistically significant ($\chi^2 = 22.687$; $p < 0.001$).

A lower proportion 18 (24.0%) of employed mothers demonstrated good practice compared to 188 (33.8%) of unemployed mothers. The association between employment status and maternal home management practices was not statistically significant ($\chi^2 = 2.894$; $p = 0.089$).

Most 152 (36.3%) of mothers at skill level 3 demonstrated good practice compared to 14 (29.2%) at level 2, 16 (28.6%) at level 4, 3 (10.0%) at level 5, and 21 (26.9%) at level 6. The association between skill level and maternal home management practices was statistically significant ($\chi^2 = 11.358$; $p = 0.023$).

A nearly equal proportion 102 (33.3%) of mothers with income below 150,000 and 104 (32.0%) of those with income $\geq 150,000$ demonstrated good practice. The association between income and maternal home management practices was not statistically significant ($\chi^2 = 0.127$; $p = 0.721$).

Table 17b: Association between socio-demographic characteristics and respondents' practices in the home management and prevention of Acute watery diarrhoea

Variable	Maternal Home Management Practices Freq (%)		Test Statistic	p- value
	Good Practice (n=208)	Poor Practice (n=425)	χ^2	
Religion				
Christianity	202 (33.4)	403 (66.6)	3.751*	0.096
Islam	4 (16.0)	21 (84.0)		
ATR	0 (0.0)	1 (100.0)		
Number of U-5 Children			17.108	<0.001
1	139 (37.5)	231 (62.5)		
2	62 (29.5)	148 (70.5)		
3	5 (9.8)	46 (90.2)		
Age of Index Child (months)			27.919	<0.001
< 12	11 (14.7)	64 (85.3)		
12 – 35	115 (29.9)	270 (70.1)		
36 – 59	80 (47.8)	91 (53.2)		
Sex of Index Child			0.501	0.479
Male	118 (31.6)	256 (68.4)		
Female	88 (34.2)	169 (65.8)		
Overall Attitude			0.325	0.569
Positive Attitude	165 (33.2)	331 (66.8)		
Negative Attitude	41 (30.6)	93 (69.4)		
Knowledge Category			26.208	<0.001
Adequate Knowledge	180 (38.2)	291 (61.8)		
Inadequate Knowledge	26 (16.3)	134 (83.7)		

*Fischer's Exact χ^2 = chi square

A higher proportion 202 (33.4%) of Christian respondents demonstrated good practice compared to 4 (16.0%) of Muslims and none of those practicing ATR. The association between religion and maternal home management practices was not statistically significant ($\chi^2 = 3.751$; $p = 0.096$).

Majority 139 (37.5%) of mothers with one under-five child had good practice compared to 62 (29.5%) of those with two children and only 5 (9.8%) of those with three children. The association between number of under-five children and maternal home management practices was statistically significant ($\chi^2 = 17.108$; $p < 0.001$).

Most 80 (47.8%) of mothers whose index child was aged 36–59 months demonstrated good practice compared to 115 (29.9%) of those with children aged 12–35 months and only 11 (14.7%) of those with infants under 12 months. The association between age of the index child and maternal home management practices was statistically significant ($\chi^2 = 27.919$; $p < 0.001$).

A slightly higher proportion 118 (31.6%) of mothers with male children had good practice compared to 88 (34.2%) of those with female children. The association between sex of the index child and maternal home management practices was not statistically significant ($\chi^2 = 0.501$; $p = 0.479$).

Similarly, 165 (33.2%) of mothers with a positive attitude demonstrated good practice compared to 41 (30.6%) of those with a negative attitude. The association between overall attitude and maternal home management practices was not statistically significant ($\chi^2 = 0.325$; $p = 0.569$).

Finally, majority 180 (38.2%) of mothers with adequate knowledge demonstrated good practice compared to only 26 (16.3%) of those with inadequate knowledge. The association between knowledge category and maternal home management practices was statistically significant ($\chi^2 = 26.208$; $p < 0.001$).

Table 18a: Predictors of Maternal home management practices amongst respondents

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Age of respondent	-0.024	0.976	0.939	1.014	0.214
Marital Status					
Not Married*		1			
Married	0.225	1.265	0.675	2.324	0.476
Level of Education					
None	-4.205	0.015	0.004	0.060	0.098
Primary	-1.851	0.157	0.019	1.324	0.089
Secondary	-1.967	0.140	0.016	1.201	0.074
Tertiary		1			
Employment Status					
Unemployed		1			
Employed	-0.841	2.319	0.582	9.239	0.233
Skill level					
Skill level 2	2.222	9.228	1.799	47.322	0.008
Skill level 3	1.535	4.640	1.046	20.578	0.043
Skill level 4	1.921	6.825	1.382	33.694	0.018
Skill level 5	2.259	9.571	1.437	63.724	0.020
Skill level 6		1			
No of Children < 5					
1	-1.684	0.186	0.070	0.492	<0.001
2	-1.363	0.256	0.093	0.700	0.008
3		1			

CI = Confidence interval; OR = Odd ratio; *reference category

R square = 14.5 – 20.2%

Age of respondent was not significantly associated with maternal home management practices ($\beta = -0.024$; OR = 0.976; 95% CI: 0.939–1.014; $p = 0.214$).

Married mothers had slightly higher odds of good practice compared to those not married (OR = 1.265; 95% CI: 0.675–2.324), but the association was not statistically significant ($\beta = 0.225$; $p = 0.476$).

Education level showed strong associations. Mothers with no formal education had markedly lower odds of good practice compared to those with tertiary education (OR = 0.015; 95% CI: 0.004–0.060; $\beta = -4.205$; $p = 0.098$). Similarly, those with primary education (OR = 0.157; 95% CI: 0.019–1.324; $\beta = -1.851$; $p = 0.089$) and secondary education (OR = 0.140; 95% CI: 0.016–1.201; $\beta = -1.967$; $p = 0.074$) also had lower odds, though these associations did not reach statistical significance.

Employment status was not significantly associated with practice. Employed mothers had higher odds of good practice compared to unemployed mothers (OR = 2.319; 95% CI: 0.582–9.239; $\beta = -0.841$; $p = 0.233$), but the relationship was not statistically significant.

Skill level was significantly associated with practice. Mothers at skill level 2 (OR = 9.228; 95% CI: 1.799–47.322; $\beta = 2.222$; $p = 0.008$), level 3 (OR = 4.640; 95% CI: 1.046–20.578; $\beta = 1.535$; $p = 0.043$), level 4 (OR = 6.825; 95% CI: 1.382–33.694; $\beta = 1.921$; $p = 0.018$), and level 5 (OR = 9.571; 95% CI: 1.437–63.724; $\beta = 2.259$; $p = 0.020$) all had significantly higher odds of good practice compared to those at skill level 6.

Number of under- five children was also significantly associated with practice. Mothers with one child had lower odds of good practice compared to those with three children (OR = 0.186; 95%

CI: 0.070–0.492; $\beta = -1.684$; $p < 0.001$). Similarly, those with two children also had lower odds (OR = 0.256; 95% CI: 0.093–0.700; $\beta = -1.363$; $p = 0.008$).

Table 18b: Predictors of Maternal home management practices amongst respondents

Factors	β	Odds Ratio	Confidence Interval		p-value
			Lower Limit	Upper Limit	
Sex of Index Child					
Female		1			
Male	-0.089	0.915	0.622	1.344	0.650
Household Income (₦)					
<150000		1			
≥150000	-0.073	0.930	0.624	1.385	0.721
Age of index child (months)	-0.032	0.969	0.954	0.984	<0.001
Level of Knowledge					
Inadequate		1			
Adequate	-1.247	0.287	0.171	0.483	<0.001
Attitude towards Diarrhea Mgt					
Negative		1			
Positive	-0.513	0.599	0.353	1.015	0.058

CI = Confidence interval; OR = Odd ratio; *reference category

R square = 14.5 – 20.2%

Male children had slightly lower odds of good maternal home management practice compared to female children (OR = 0.915; 95% CI: 0.622–1.344; $\beta = -0.089$), but the association between sex of the index child and practice was not statistically significant ($p = 0.650$).

Mothers from households earning $\geq$ ₦150,000 had lower odds of good practice compared to those earning $<$ ₦150,000 (OR = 0.930; 95% CI: 0.624–1.385; β = -0.073), though this association was not statistically significant (p = 0.721).

Age of the index child was significantly associated with maternal practice. With each additional month of age, the odds of good practice decreased slightly (OR = 0.969; 95% CI: 0.954–0.984; β = -0.032), and this association was statistically significant (p < 0.001).

Knowledge level was also significantly associated with practice. Mothers with adequate knowledge had lower odds of poor practice compared to those with inadequate knowledge (OR = 0.287; 95% CI: 0.171–0.483; β = -1.247), and this association was statistically significant (p < 0.001).

Finally, mothers with a positive attitude towards diarrhoea management had lower odds of poor practice compared to those with a negative attitude (OR = 0.599; 95% CI: 0.353–1.015; β = -0.513), but the association did not reach statistical significance (p = 0.058).

SECTION E

**BARRIERS FACED BY MOTHERS IN BENIN CITY IN ACCESSING HEALTHCARE
SERVICES FOR THE MANAGEMENT OF ACUTE WATERY DIARRHEA IN
CHILDREN UNDER FIVE**

Table 19a: Barriers faced by respondents in accessing healthcare services for the management of acute watery diarrhoea in children under five

Variables	Frequency (n = 631)	Percent
Sought Care at Health Facility		
Yes	447	70.8
No	184	29.2
Reasons for Not Seeking Tx (n = 184)*		
Child usually recovers on their own	62	9.8
Long distance to facility	35	5.5
Lack of money	24	3.8
Preference for traditional care	17	2.7
Spouse/partner disapproval	7	1.1
Negative experiences with health workers	4	0.6
Drugs not available at facility	3	0.5
Mother was also sick	1	0.2
Time to Reach Nearest Health Facility		
<30 minutes	398	63.1
30–60 minutes	178	28.2
>1 hour	55	8.7
ORS at Nearest Facility/Pharmacy		
Yes	399	63.3
No	16	2.5
Don't know	216	34.2
Zinc at Nearest Facility/Pharmacy		
Yes	302	47.9
No	32	5.1
Don't know	297	47.1
Received Health Education on Diarrhoea Mgt	311	49.3

* MRQ

Tx – Treatment; Mgt - Management

Most 447 (70.8%) of respondents sought care at a health facility when their child had diarrhoea.

Among those who did not seek treatment, the most common reason was that the child usually

recovers on their own 62 (9.8%), followed by long distance to the facility 35 (5.5%) and lack of money 24 (3.8%).

A higher proportion 398 (63.1%) of respondents reported reaching the nearest health facility in less than 30 minutes compared to 178 (28.2%) who took 30–60 minutes. The least proportion 55 (8.7%) took more than one hour.

Most 399 (63.3%) of respondents reported that ORS was available at the nearest facility/pharmacy, while 216 (34.2%) did not know.

Slightly less than half, 302 (47.9%) of respondents reported that zinc was available at the nearest facility/pharmacy compared to 297 (47.1%) who did not know.

Nearly half 311 (49.3%) of respondents had received health education on diarrhoea management.

Table 19b: Barriers faced by respondents in accessing healthcare services for the management of acute watery diarrhoea in children under five

Variables	Frequency	Percent
Source of Health Education (n = 311)*		
Health worker	210	33.3
Community health worker	28	4.4
Friend/Family	14	2.2
Media (radio/TV)	6	0.9
Workshop/Training	3	0.5
School	4	0.6
Cultural/Traditional Beliefs Influence Care-Seeking (n = 631)	22	3.5
Cultural or Traditional Beliefs Influencing Care-Seeking (n = 22)		
Preference for traditional healers	9	40.9
Preference for herbal medicines	4	18.2
Spiritual beliefs	2	9.1
Family influence (“that was what my mom used...”)	2	9.1
Other personal reasons (“best for child”, “yes”)	5	22.7
Lack of Transportation as a Barrier (n = 631)	60	9.5
Denied Care or Faced Challenges at Facility (n = 631)	46	7.3

* - MRQ

Among respondents who received health education, the majority 210 (33.3%) reported health workers as their source, followed by community health workers 28 (4.4%). The least proportions were from workshops/trainings 3 (0.5%), schools 4 (0.6%), and media 6 (0.9%).

Only 22 (3.5%) respondents reported that cultural or traditional beliefs influenced care-seeking. Of these, the most common reason was preference for traditional healers 9 (40.9%), followed by

herbal medicines 4 (18.2%). Other reasons included spiritual beliefs 2 (9.1%), family influence 2 (9.1%), and personal reasons 5 (22.7%).

A small proportion 60 (9.5%) of respondents reported lack of transportation as a barrier to care, while 46 (7.3%) reported being denied care or facing challenges at health facilities.

Table 19c: Barriers faced by respondents in accessing healthcare services for the management of acute watery diarrhoea in children under five

Variables	Frequency (n = 46)	Percent
Negative Experiences at Health Facilities (n = 46)		
Long waiting times	31	67.4
Unavailable staff	2	4.3
Overcrowding (too many patients, few staff)	6	13.0
Poor staff attitude (inconsiderate, gossiping, etc)	3	6.5
Government hospital not attending	2	4.3
Other (miscellaneous)	2	4.3

* MRQ

Among respondents who reported negative experiences at health facilities, the majority 31 (67.4%) cited long waiting times. Other reported challenges included overcrowding 6 (13.0%), poor staff attitude 3 (6.5%), unavailable staff 2 (4.3%), government hospitals not attending 2 (4.3%), and miscellaneous reasons 2 (4.3%).

CHAPTER FIVE

DISCUSSION

This study was conducted to assess the knowledge, attitudes, and home management practices of mothers in Benin City regarding acute watery diarrhoea in children under five. It further examined the determinants of these practices, the barriers mothers face in accessing healthcare services, and the influence of socio-demographic and cultural factors. The findings from this study showed that the majority of respondents were within the 30–39 years age group, with a mean age of 31.6 ± 5.2 years. Most respondents were of Benin ethnicity (43.1%), and a large proportion were married (86.8%). Additionally, over half of the respondents had attained tertiary education (52.0%), and the majority were employed (556 respondents), with only a small proportion being unemployed. Most households earned between ₦90,000 and ₦250,000 monthly, with a median income of ₦150,000. These findings may be explained by the urban nature of Benin City, where women in their reproductive and economically active years are more likely to be married, educated, and engaged in income-generating activities. The predominance of mothers within the 30–39 years age group reflects the period most associated with active childbearing and caregiving, making them more likely to have under-five children and thus be included in the study. Furthermore, the high level of tertiary education observed among respondents may be attributed to increased access to educational opportunities in urban settings, which in turn may enhance exposure to health information and influence health-related decision-making.

The high proportion of employed respondents suggests increasing female participation in the workforce in urban Nigeria; however, the observed income distribution indicates that many

households still fall within the low- to middle-income category. This may reflect the nature of employment in such settings, where many women are engaged in low-paying or informal sector jobs, thereby limiting their financial capacity despite being employed. This economic reality may have implications for healthcare access and the affordability of essential interventions such as oral rehydration solution and zinc supplementation during diarrhoeal episodes.

When compared with existing literature, these findings are consistent the Lagos, Nigeria study,⁴ where the majority of mothers were within the 30–39 years age group, predominantly married, and had attained at least secondary or tertiary education. Similarly, studies conducted in India and Ethiopia have reported that mothers of under-five children are commonly within the economically active age group and possess moderate to high levels of education, particularly in urban populations.^{31, 36} However, unlike some studies in rural settings where unemployment rates among mothers were higher, this study demonstrated a higher proportion of employed women, highlighting the influence of urbanization on women's economic participation.⁴⁹

The socio-demographic profile observed in this study has important public health implications. Maternal education is a key determinant of child health outcomes, as educated mothers are more likely to recognize early signs of illness, adopt appropriate home-based management practices, and seek timely healthcare.¹ Similarly, household income influences access to healthcare services and essential commodities, and lower income levels may contribute to delays in care-seeking and suboptimal management of childhood illnesses such as diarrhoea.¹² Therefore, even within a relatively educated and employed population, economic constraints may still pose significant barriers to optimal child health practices.

The concentration of respondents within the reproductive and economically active age group underscores their critical role in child survival and household wellbeing. As primary caregivers, their knowledge, attitudes, and practices directly influence the health outcomes of under-five children. Based on these findings, it is recommended that public health interventions should not only focus on health education but also address underlying socioeconomic constraints. Strategies such as strengthening primary healthcare services, improving access to affordable treatment options, and implementing community-based health education programmes should be prioritised to enhance the effective management of acute watery diarrhoea among under-five children.

The findings from this study showed that the majority of index children were aged between 12–35 months, followed by those aged 36–59 months, while the least were infants below 12 months. In terms of sex distribution, male children constituted a slightly higher percentage compared to females. Regarding family size, most mothers had one or two under-five children, while fewer had three.

These findings may be explained by the demographic profile of households in Benin City, where fertility rates are moderate and families often have one or two young children at a time. The predominance of children aged 12–35 months reflects the age group most vulnerable to diarrhoeal episodes due to weaning, increased exposure to contaminated food and water, and developing immunity. The slightly higher proportion of male children may be due to natural sex distribution patterns, though cultural factors such as preference for male children may also play a role in reporting.

When compared with existing literature, these findings are consistent with studies conducted in Lagos⁴ and Kaduna,⁶ Nigeria, where diarrhoea prevalence was highest among children aged 12–

35 months and ORT utilization was lowest among mothers with multiple under-five children. Similar results were reported in Dire Dawa, Ethiopia, where toddlers were more likely to experience diarrhoea due to increased mobility and exposure to environmental pathogens.²⁷ The World Health Organization also emphasizes that children aged 6–24 months are at greatest risk of diarrhoeal morbidity and mortality due to weaning and increased exposure to contaminated food and water.¹

The predominance of diarrhoeal episodes among children aged 12–35 months has important public health implications. This age group is critical for growth and development, and repeated diarrhoeal episodes can lead to malnutrition, stunting, and increased susceptibility to other infections. The finding that mothers with three under-five children had the poorest practices underscores the burden of caregiving in larger families, which may dilute attention and resources available for each child.

Based on these findings, targeted interventions should focus on mothers of toddlers (12–35 months), emphasizing continued feeding, safe weaning practices, and correct ORS use. Family planning services should also be strengthened to reduce the strain of caring for multiple under-five children simultaneously. Community health workers can provide tailored support to households with larger family sizes, ensuring that vulnerable children receive adequate care during diarrhoeal episodes.

This study found that nearly three-quarters of mothers had adequate knowledge of the causes, symptoms, and home management of acute watery diarrhoea, while about one-quarter demonstrated inadequate knowledge. The predominance of adequate knowledge can be explained by the socio-demographic profile of respondents. For instance, about nine in ten

mothers had at least secondary education or above, which likely enhanced their ability to correctly identify diarrhoea, recognize danger signs, and understand the importance of Oral Rehydration Solution (ORS).

Health workers also played a central role in shaping maternal knowledge, as about two-thirds of respondents reported receiving information from health workers, making them the most common source of information. This strong reliance on professional health communication may have contributed to the high level of adequate knowledge observed.

Despite this, gaps remain. Nearly half of the mothers attributed diarrhoea to teething, and a very small fraction linked it to spiritual causes. These findings suggest that cultural beliefs continue to influence maternal understanding, even in urban settings with relatively high literacy and access to health services.

When compared with existing literature, this finding is consistent with studies conducted in Lagos, Nigeria, where maternal knowledge of diarrhoea prevention and management was relatively high but misconceptions remained common.⁴ Similarly, research in Dire Dawa, Ethiopia reported that while many mothers recognized diarrhoea symptoms, knowledge of correct ORS preparation was limited.²⁷

Adequate maternal knowledge is essential for early recognition of diarrhoea, prompt initiation of ORS, and prevention of dehydration. The World Health Organization emphasizes that caregiver knowledge is a cornerstone of diarrhoea prevention and treatment, as it determines uptake of proven interventions such as ORS and zinc supplementation.¹ Misconceptions, however, can delay appropriate treatment and increase child vulnerability to morbidity and mortality.

Addressing these gaps is critical for achieving Sustainable Development Goal 3, which seeks to end preventable deaths of children under five.

Based on these findings, targeted interventions should focus on reinforcing correct knowledge while dispelling misconceptions. Health education programs should emphasize practical demonstrations of ORS preparation, highlight the dangers of dehydration, and clarify that teething is not a cause of diarrhoea. Community health workers should be further empowered to deliver culturally sensitive education, while mass media campaigns can complement interpersonal communication to reach wider audiences.

The findings from this study revealed that nearly four fifths of mothers demonstrated a positive attitude towards the home management of acute watery diarrhoea among under-five children. This generally favourable disposition may be explained by patterns observed within the study, particularly the relatively high level of knowledge, as nearly three quarters of respondents demonstrated adequate knowledge. This supports the well-established relationship between knowledge and attitude, where improved understanding of a disease condition often translates into more favourable perceptions towards its management. In addition, the fact that health workers were the primary source of information for a majority of respondents likely reinforced positive attitudes, as consistent exposure to correct health information may strengthen confidence in recommended interventions such as oral rehydration solution.

Despite this, the persistence of negative attitudes among a minority of respondents highlights important gaps. Findings from this study showed that some mothers preferred to delay initiation of treatment until the child's condition worsened, while others relied on home remedies rather than evidence-based interventions. These attitudes may be explained by underlying cultural

beliefs and misconceptions identified within the study, as well as possible economic considerations that influence treatment choices. Such patterns suggest that, although awareness exists, not all mothers are fully convinced about the effectiveness or necessity of recommended practices.

When compared with existing literature, the percentage of mothers with positive attitudes in this study is comparable to findings from other parts of Nigeria. Studies conducted in Kano and Nasarawa reported that over three quarters of caregivers demonstrated favourable attitudes towards diarrhoea management.³⁹ Similarly, studies in Kaduna and Enugu have documented generally positive maternal attitudes, although these were sometimes limited by doubts about the effectiveness of oral rehydration therapy and continued reliance on traditional remedies.^{6,9} These similarities suggest that while attitudes towards diarrhoea management are improving in many Nigerian settings, residual misconceptions and behavioural barriers persist.

The public health significance of these findings is considerable. Maternal attitudes play a critical role in determining health-seeking behaviour and adherence to recommended treatment practices. Positive attitudes are associated with prompt initiation of appropriate care and improved outcomes, whereas negative attitudes may result in delayed treatment, inappropriate home management, and increased risk of dehydration and mortality among under-five children. Addressing these attitudinal gaps is therefore essential for improving child survival and reducing the burden of preventable deaths.

Based on these findings, it is recommended that health education interventions should place greater emphasis on translating knowledge into practice by addressing attitudinal barriers. Efforts should focus on reinforcing the effectiveness of oral rehydration solution and zinc

supplementation, correcting misconceptions identified in this study, and discouraging delays in treatment initiation. In addition, culturally sensitive communication strategies and community-based interventions should be implemented to reshape perceptions and promote positive health behaviours, while healthcare workers should be supported to actively engage mothers on these issues during routine maternal and child health services.

The findings from this study revealed that only about one-third of mothers, demonstrated good practice in the home management of acute watery diarrhoea in under-five children. This indicates that although knowledge and attitudes were largely positive, translation into effective practice was limited.

These practice outcomes may be explained by several factors. First, while nearly three-quarters of mothers had adequate knowledge, gaps remained in specific areas such as correct ORS preparation and zinc supplementation. For example, only about three-fifths correctly identified salt, sugar, and water as the ingredients for ORS, and less than half knew it should be discarded within 24 hours. Second, cultural reliance on home remedies and misconceptions about feeding during diarrhoea episodes may have contributed to poor practice. Structural barriers such as limited access to zinc tablets and inconsistent availability of ORS in community settings may also play a role.

When compared with existing literature, the percentage of mothers with good practice in this study is lower than that reported in Lagos, where more mothers demonstrated appropriate home management practices, particularly with respect to ORS use.⁴ Similarly, studies conducted in Kano and Nasarawa reported more favourable caregiving practices despite socioeconomic differences.³⁹ However, findings from Kaduna and Enugu align more closely with this study, as

although awareness of ORS was relatively high, adherence to recommended practices such as continued feeding and zinc supplementation remained suboptimal.^{6,9} This pattern is also reflected in international studies; for instance, research conducted in India reported high awareness of diarrhoea management but inadequate practical application, particularly regarding zinc use and feeding practices.³² Studies in Ethiopia similarly documented low levels of appropriate home management despite some degree of maternal awareness.³⁶ These findings suggest that the gap between knowledge and practice is a consistent challenge across both local and international settings, often influenced by cultural norms, access to resources, and health system factors.

The predominance of poor practices has significant implications. Inadequate home management increases the risk of dehydration, prolongs illness, and heightens the likelihood of preventable mortality. This gap between knowledge, attitude, and practice highlights the need for targeted interventions to ensure that mothers not only understand diarrhoea management but also apply it correctly.

Based on these findings, it is recommended that interventions should focus on strengthening maternal practices through practical demonstrations of ORS preparation, community distribution of zinc tablets, and reinforcement of continued feeding during diarrhoea episodes. Health workers should be trained to emphasize these practices during routine maternal and child health visits. In addition, culturally sensitive campaigns and peer support groups can help dispel misconceptions and encourage consistent application of recommended practices.

The findings from this study demonstrated that several factors were significantly associated with mothers' knowledge, attitudes, and practices regarding the home management of acute watery

diarrhoea among under-five children. Notably, maternal education, marital status, and selected child-related factors such as age of the index child and number of under-five children showed significant relationships with knowledge, while practice was influenced by similar socio-demographic and caregiving variables. Mothers with higher levels of education, those who were married, and those with greater caregiving experience were more likely to demonstrate better knowledge and appropriate practices.

These findings may be explained by underlying differences in health literacy, access to information, and caregiving experience among respondents. Mothers with higher educational attainment are more likely to understand health information, recognize symptoms early, and apply appropriate management strategies. Similarly, married women may benefit from additional social and financial support within the household, which can facilitate access to healthcare information and resources. Child-related factors such as increasing age of the index child and having more under-five children may reflect accumulated caregiving experience, which enhances a mother's ability to recognize and manage diarrhoeal illness effectively. In contrast, mothers with lower educational levels or limited caregiving exposure may have reduced capacity to interpret health information or implement appropriate practices.

When compared with existing literature, these findings are consistent with studies conducted in Nigeria and other developing settings. A study in Lagos reported that maternal education was a significant predictor of both knowledge and appropriate diarrhoea management practices.⁴ Similarly, studies conducted in India and Ethiopia identified maternal education and socioeconomic status as key determinants of maternal knowledge and child health practices, including diarrhoea management.^{32, 36} Other Nigerian studies have also reported significant

associations between socio-demographic factors such as marital status, income, and maternal health behaviours, reinforcing the role of social and economic context in shaping caregiving practices.^{6, 9} However, studies in higher-income settings have reported weaker associations between socio-demographic factors and child health practices, likely due to better access to health information, stronger healthcare systems, and reduced socioeconomic disparities.

The identification of these associated factors has important public health implications. The findings suggest that knowledge and appropriate practices are not evenly distributed within the population but are influenced by underlying social and economic inequalities. Mothers with lower levels of education and limited resources may be at greater risk of poor knowledge and suboptimal practices, thereby increasing the vulnerability of their children to adverse health outcomes. This highlights the need to address not only individual-level knowledge gaps but also broader structural determinants of health.

Based on these findings, it is recommended that interventions should adopt a targeted approach focusing on vulnerable groups identified in this study. Efforts should prioritize improving access to health education among mothers with lower educational attainment, while strengthening community-based programmes that provide practical guidance on diarrhoea management. In addition, leveraging healthcare workers and primary healthcare platforms to deliver tailored health education can help bridge knowledge gaps. Strategies that enhance women's access to resources and support systems may also improve caregiving practices and ultimately contribute to better child health outcomes.

The findings from this study revealed that although most mothers sought care at health facilities when their child had diarrhoea, nearly one-third did not. The most common reasons for not

seeking treatment were the belief that the child usually recovers on their own, long distance to the facility, and lack of money. Other barriers included preference for traditional care, spouse disapproval, negative experiences with health workers, and unavailability of drugs.

Structural barriers were also evident. While most respondents reached the nearest health facility within 30 minutes, more than one-third required 30–60 minutes or more than one hour. Drug availability was inconsistent. While more than half of the mothers reported that ORS could be obtained, a sizeable number were unsure of its availability. Access to zinc was even more limited, with less than half confirming that it was obtainable and nearly as many uncertain. Furthermore, only about half of mothers had received health education on diarrhoea management, mostly from health workers.

These barriers may be explained by socioeconomic and systemic realities. Financial constraints limit the ability to purchase drugs or pay for consultations, while long distances and poor transport infrastructure discourage timely care seeking. Overcrowded facilities and long waiting times — reported by more than two-thirds of those with negative experiences — reduced motivation to seek professional help. Cultural beliefs, though mentioned by only a small fraction of mothers, still influenced care seeking, with preferences for traditional healers and herbal medicines being the most common.

When compared with existing literature, these findings are consistent with studies in Kano and Nasarawa,³⁹ which reported that despite positive attitudes, caregivers often faced barriers such as cost and accessibility. Similarly, studies in Kaduna and Enugu^{6,9} identified financial constraints and reliance on traditional remedies as major obstacles. In Lagos,³⁰ although mothers demonstrated better practices, barriers such as overcrowded facilities and drug shortages were

still reported. Internationally, studies in India¹² highlighted sociocultural pressures and limited institutional support as barriers. This contrast underscores the role of systemic and structural factors in shaping health outcomes.

The persistence of these barriers has significant implications. They contribute to delayed treatment, poor adherence to recommended practices, and increased risk of dehydration and mortality. Barriers also undermine the effectiveness of health education, as knowledge and attitudes cannot be translated into practice without supportive structures.

Based on these findings, it is recommended that interventions should focus on reducing financial and structural barriers by subsidizing ORS and zinc, expanding community distribution points, and improving transport access to health facilities. Health system strengthening is needed to reduce waiting times and ensure consistent drug availability. Community-based education campaigns should address cultural misconceptions and promote prompt care seeking. Integrating diarrhoea management into routine child health services and outreach programmes can also help overcome barriers by bringing services closer to households.

CONCLUSION

This study revealed that nearly three-quarters of mothers had adequate knowledge of the causes, symptoms, and home management of acute watery diarrhoea in under-five children. It also showed that about four-fifths of mothers demonstrated positive attitudes, influenced by health education and exposure to health workers. However, only one-third of mothers practiced appropriate home management, with gaps in ORS preparation, zinc supplementation, and continued feeding. The study further identified significant barriers to care-seeking, including financial constraints, distance to facilities, drug unavailability, and negative experiences with health workers.

RECOMMENDATIONS

TO THE FEDERAL MINISTRY OF HEALTH AND THE NATIONAL PRIMARY HEALTH CARE DEVELOPMENT AGENCY (NPHCDA)

1. Ensure uninterrupted supply of ORS and zinc tablets across all primary health centres and community pharmacies.
2. Subsidise ORS and zinc to make them affordable for low- income households.
3. Integrate diarrhoea management education into routine child health and immunisation programmes.
4. Train health workers to provide practical demonstrations of ORS preparation and reinforce continued feeding.

TO THE EDO STATE MINISTRY OF HEALTH AND LOCAL GOVERNMENT HEALTH AUTHORITIES

1. Strengthen community outreach programmes to improve awareness and correct practices at household level.
2. Reduce structural barriers by expanding facility coverage in underserved areas and improving transport access.
3. Monitor drug availability and address shortages promptly.
4. Organise regular maternal health education sessions at community health posts.

TO HEALTHCARE PROVIDERS AND HEALTH WORKERS

1. Demonstrate correct ORS preparation during antenatal, postnatal, and child welfare clinic visits.
2. Reinforce zinc supplementation and continued feeding during diarrhoea episodes.
3. Provide culturally sensitive counselling to dispel misconceptions about home remedies.
4. Improve patient experience by reducing waiting times and addressing negative staff attitudes.

TO NON-GOVERNMENTAL ORGANISATIONS (NGOs) AND CIVIL SOCIETY GROUPS

1. Expand grassroots awareness campaigns on diarrhoea management.
2. Provide mobile clinics and community pharmacies to improve access.
3. Advocate for stronger government commitment to child health interventions.
4. Conduct continuous community research to monitor maternal practices and barriers.

TO MOTHERS AND CAREGIVERS

1. Keep ORS packets and zinc tablets readily available at home.
2. Begin treatment immediately when diarrhoea starts, and continue feeding during episodes.
3. Seek care promptly at health facilities rather than relying on home remedies.
4. Participate in community health education and peer support groups to strengthen practices.

REFERENCES

1. World Health Organization. Diarrhoeal disease [Internet]. Geneva: World Health Organization; 2024 [cited 2025 Mar 21]. Available from <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>.

2. United Nations International Children's Emergency Fund. Diarrhoeal disease - UNICEF DATA [Internet]. UNICEF DATA. 2024 [cited 2025 Apr 10]. Available from: <https://data.unicef.org/topic/child-health/diarrhoeal-disease/>

3. Dirisu JO, Agbakoba NR, Okwelogu SI, Eki-Udoko FE, Elo-Ilo JC, Oladipo O. Bacterial and fungal agents of diarrhoea among under-fives in two tertiary hospitals in southern Nigeria. *World J Pharm Med Res*. 2024;10(1):219–224.

4. Momoh FE, Olufela OE, Adejimi AA, Roberts AA, Oluwole EO, Ayankogbe OO, Onajole AT. Mothers' knowledge, attitude and home management of diarrhoea among children under five years old in Lagos, Nigeria. *Afr J Prim Health Care Fam Med*. 2022;14(1):e1-e10. doi:10.4102/phcfm.v14i1.3119.

5. Azanaw J, Malede A, Yalew HF, Worede EA. Determinants of diarrhoeal diseases among under-five children in Africa (2013–2023): a comprehensive systematic review highlighting geographic variances, socioeconomic influences, and environmental factors. *BMC Public Health*. 2024;24:2399. doi:10.1186/s12889-024-19962-0.

6. Omole VN, Wamyil-Mshelia TM, Nmadu GA, Usman NO, Andeyantso EA, Adiri F. Knowledge, attitude and practice of home management of diarrhoea among mothers of under-fives in Samaru, Kaduna State, Nigeria. *Port Harcourt Med J*. 2019;13(1):19-25. [https://doi:10.4103/phmj.phmj_23_18](https://doi.org/10.4103/phmj.phmj_23_18).

7. CDC. About Global Water, Sanitation and Hygiene (WASH) [Internet]. Global Water, Sanitation, and Hygiene (WASH). 2024. Available from: <https://www.cdc.gov/global-water-sanitation-hygiene/about/index.html>
Exp. 2018;6(4):191–197. <https://doi.org/10.15406/jmen.2018.06.00213>

8. World Health Organization. The Integrated Global Action Plan for Prevention and Control of Pneumonia and Diarrhoea (GAPPD) [Internet]. www.who.int. 2013. Available from: [https://www.who.int/publications/i/item/the-integrated-global-action-plan-for-prevention-and-control-of-pneumonia-and-diarrhoea-\(gappd\)](https://www.who.int/publications/i/item/the-integrated-global-action-plan-for-prevention-and-control-of-pneumonia-and-diarrhoea-(gappd))
9. Global Alliance for Vaccines and Immunization(Gavi), The vaccine alliance. Rotavirus vaccine support [Internet]. www.gavi.org. 2018 [cited 2025 Apr 10]. Available from: <https://www.gavi.org/types-support/vaccine-support/rotavirus>
10. Burnett E, Jonesteller CL, Tate JE, Yen C, Parashar UD. Global Impact of Rotavirus Vaccination on Childhood Hospitalizations and Mortality From Diarrhea. *The Journal of Infectious Diseases*. 2017 Apr 18;215(11):1666–72.
11. Public Health. National Program on Immunization (NPI) Schedule In Nigeria - Public Health [Internet]. National Programme on Immunization (NPI) Schedule in Nigeria. 2020 [cited 2025 Apr 10]. Available from: <https://www.publichealth.com.ng/national-program-on-immunization-npi-schedule-in-nigeria/>
12. Federal Ministry of Health and Social Welfare (FMoHSW), National Population Commission (NPC) [Nigeria], and ICF. Nigeria Demographic and Health Survey 2023–24: Key Indicators Report [Internet]. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF; 2024 [cited 2025 Mar 21]. Available from: www.DHSprogram.com
13. United Nations. Transforming our world: The 2030 agenda for sustainable development [Internet]. United Nations. 2015 [cited 2025 Mar 31]. Available from: <https://sdgs.un.org/2030agenda>
14. World Health Organization. Child Mortality [Internet]. www.who.int. 2024 [cited 2025 Mar 31]. Available from: https://www.who.int/data/gho/data/themes/topics/sdg-target-3_2-newborn-and-child-mortality

15. United Nations. Goal 6: Clean water and sanitation [Internet]. The Global Goals. 2022 [cited 2025 Mar 31]. Available from: <https://www.globalgoals.org/goals/6-clean-water-and-sanitation/>
16. United Nations Children's Fund (UNICEF), World Health Organization (WHO). Diarrhoea: why children are still dying and what can be done. Geneva: WHO; 2009.
17. American Public Health Association. Reduce Diarrhea Mortality Globally [Internet]. American Public Health Association. 2018 [cited 2025 Apr 25]. Available from: <https://www.apha.org/policy-and-advocacy/public-health-policy-briefs/policy-database/2019/01/28/reduce-diarrhea-mortality-globally>
18. Oruikor GJ, Durotoye MP. Assessment of mothers' knowledge and use of oral rehydration therapy for diarrhoea in children under 5 years in Ife, Nigeria. Niger Health J. 2023;23(3):828-836. Available from: <https://www.researchgate.net/publication/374584544>.
19. National Population Commission (NPC) [Nigeria], ICF International. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International; 2014.
20. UNICEF. The state of the world's children in 2017: Child survival. New York, USA: Unicef; 2017.
21. National Population Commission (NPC) [Nigeria], ICF. 2019. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF.
22. Reuters. Nigeria reports 359 cholera deaths in first nine months of year [Internet]. Reuters; 2024 Oct 7 [cited 2025 Mar 19]. Available from: <http://www.reuters.com/world/africa/nigeria-reports-359-cholera-deaths-first-nine-months-year-2024-10-07>.

23. National Bureau of Statistics. Demographic Statistics Bulletin 2015 1 A Publication of Demographic Statistics Division i. <https://www.nigerianstat.gov.ng/pdfuploads/>. 2015.
24. Patwari AK. Diarrhoea and malnutrition interaction. *Indian J Pediatr*. 1999;66(1):S124–134.
25. Kåre Mølbak, Henrik Jeldtoft Jensen, L Ingholt, Aaby P. Risk Factors for Diarrheal Disease Incidence in Early Childhood: a Community Cohort Study from Guinea-Bissau. *Am Journal of Epidemiology*. 1997 Aug 1;146(3):273–82..
26. Checkley W, Buckley G, Gilman RH, Assis AM, Guerrant RL, Morris SS, et al. Multi-country Analysis of the Effects of Diarrhoea on Childhood Stunting. *International Journal of Epidemiology*. 2008 Jun 20;37(4):816–30.
27. Workie HM, Sharifabdilahi AS, Addis EM. Mothers' knowledge, attitude and practice towards the prevention and home-based management of diarrheal disease among under-five children in Dire Dawa, Eastern Ethiopia: a cross-sectional study. *BMC Pediatr*. 2018;18:358. doi:10.1186/s12887-018-1321-6.
28. Ogunrinde OG, Raji T, Owolabi OA, Anigo KM. Knowledge, attitude and practice of home management of childhood diarrhoea among caregivers of under-five children with diarrhoeal disease in northwestern Nigeria. *Journal of Tropical Pediatrics* [Internet]. 2011 Jun 3 [cited 2025 Mar 31];58(2):143–6. Available from: <https://pubmed.ncbi.nlm.nih.gov/21642322/>
29. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Education Quarterly*. 1988;15(4):351–77. doi:10.1177/109019818801500401.

30. Cevriye Yüksel Kaçan, Aylin Palloş, Güven Özkaya. Examining knowledge and traditional practices of mothers with children under five in Turkey on diarrhoea according to education levels. *Annals of Medicine*. 2022 Feb 28;54(1):674–82.
31. Chaudhary P, Basu S, Dzeyie K, Gulla S, Khade S, Patel A, et al. Knowledge, attitude and practice of mothers regarding diarrhoeal illness in children under five years of age: A Cross Sectional Study in an Urban Slum of Delhi, India. 2014.
32. Mallick AKR, Bangari J, Kumar SS, Suyal H. Knowledge, attitude and practice of acute diarrheal disease and use of oral rehydration therapy among mothers of under five children. *International Journal of Contemporary Pediatrics*. 2019 Aug 23;6(5):1976.
33. Kumar Gupta D, Sah P, Dipak K, Gupta. Knowledge, attitude and practice of mothers of children below five years regarding diarrhoea. 2021 Jun.
34. Mumtaz Y, Zafar M, Mumtaz Z. Knowledge, attitude and practices of mothers about diarrhea in children under 5 years. *Journal of the Dow University of Health Sciences*. 2014;8(1):3-6.
35. Abdulla ONM, Badulla WFS, Alshakka M, Al-Abd N, Ibrahim MIM. Mothers knowledge, attitude and practice regarding diarrhea and its management in Aden-Yemen: A Cross-Sectional Study in Poor Resource Setting. *Journal of Pharmaceutical Research International*. 2021 Oct 8;365–78.
36. Merga N, Alemayehu T. Knowledge, perception, and management skills of mothers with under-five children about diarrhoeal disease in indigenous and resettlement communities in Assosa District, Western Ethiopia. *Journal of Health, Population and Nutrition*. 2015;33(1):20-30.
37. Thiam S, Sy I, Schindler C, Niang-Diène A, Faye O, Utzinger J, et al. Knowledge and practices of mothers and caregivers on diarrhoeal management among under 5-year-old children in a medium-size Town of Senegal. *Acta Tropica*. 2019 Jun;194(155-164):155–64.

38. Abdiaziz Sheikh M. Caregiver's knowledge, attitudes and practices towards management of acute diarrhea among children 0–59 months in Jinja Regional Referral Hospital, Jinja District. A research report submitted to the Faculty of Clinical Medicine and Dentistry in partial fulfilment of the award of Bachelor of Medicine and Bachelor of Surgery of Kampala International University, Western Campus. 2018.
39. Bello U, Yunusa U, Abdulrashid I, Umar M. Comparative studies of knowledge and perception of parents on home managements of diarrheal diseases among under Five Children between two communities of Kano State, Nigeria. *International Journal of Pharmaceutical Science Invention*. 2015;4(9):23–31.
40. Omowumi Olopha O, Egbewale B. Awareness and knowledge of diarrhoeal home management among mothers of under-five in Ibadan, Nigeria. *Universal Journal of Public Health*. 2017 Jan;5(1):40–5.
41. Irin I, Kurniadi A. The relationship of mother's knowledge, attitude, and behavior regarding diarrhea with the number of diarrhea toddlers taken to the health Facility. *Journal of Urban Health Research*. 2022 Nov 1;1(1):38–46.
42. Marouf AHR. Mother's Knowledge, attitude and ractice of children under five years old with diarrhea and dehydration in the West bank. 2019.
43. Abate BB, Zemariam AB, Wondimagegn A, Abebe GK, Araya FG, Kassie AM, et al. Knowledge, attitude and practice of home management of diarrhea among under-five Children in East Africa: a Systematic Review and meta-analysis. Simegn W, editor. *Plos One*. 2024 Feb 23;19(2):e0298801.
44. Page AL, Hustache S, Luquero FJ, Djibo A, Manzo ML, Grais RF. Health care seeking behavior for diarrhea in children under five in rural Niger: Results of a cross-sectional Survey. *BMC Public Health*. 2011 May 25;11(1).

45. dos Santos YF, de B Correia J, Falbo AR. Knowledge about prevention and management of acute diarrhoea among caregivers of children aged under five years treated at an emergency department in Pernambuco, Brazil. *Tropical Doctor*. 2014 Dec 22;45(2):126–8.
46. Federal Ministry of Health and Social Welfare (Nigeria), National Population Commission (Nigeria), ICF. Nigeria Demographic and Health Survey 2023–24: Key Indicators Report. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF; 2024.
47. Sa'id Sa'ad Z, Hoque K, Bello Arkilla M. Mothers' knowledge practices in home management of childhood diarrhea in Kano state: a Cross sectional study. *Malta Review of Educational Research*. 2018;12(2).
48. Lopes De Oliveira R, Shellem Bessa De Oliveira B, Colares Bezerra J, Nascimento Da Silva M, Mayra De Sousa Melo F, Joventino E, et al. Influence of socio-economic conditions and maternal knowledge in self-effectiveness for prevention of childhood diarrhea. *Escola Anna Nery*. 2017;21(4):20160361.
49. Adeleke AI, Mhlaba T. Maternal knowledge, attitudes and practices towards prevention and management of child diarrhoea in urban and rural Maseru, Lesotho. *International Journal of Tropical Disease & Health*. 2019;36(2):1-20. doi:10.9734/ijtdh/2019/v36i230140.
50. Ansari M, Ibrahim MIM, Hassali MA, Shankar PR, Koirala A, Thapa NJ. Mothers' Beliefs and Barriers about Childhood Diarrhea and Its Management in Morang district, Nepal. *BMC Research Notes*. 2012 Oct 24;5(1).
51. Fikire Id A, Ayele G, Haftu D. Determinants of delay in care seeking for diarrheal diseases among mothers/caregivers with under-five children in public health facilities of Arba Minch town, Southern Ethiopia; 2019. 2020 Feb.

52. Tebeje TM, Tesfaye SH, Abebe M, Seboka BT, Tesfa GA, Seifu BL, et al. Healthcare-seeking behavior for diarrhea in under-five children and associated factors in sub-saharan Africa: a Multilevel Robust Poisson Regression Model. *Frontiers in Public Health*. 2024 Oct 9;12.
53. Zaza Z, Marew A, Jebero Zaza Z, Birhanu S, Belachew A, Kasse T. Delays in health care seeking for diarrheal disease and associated factors among caregivers of under five children in health centers of Northwest Ethiopia: a Mixedmethod Study. *Springer Nature*.
54. Bedford KJA, Sharkey AB. Local barriers and solutions to improve care-seeking for childhood pneumonia, diarrhoea and malaria in Kenya, Nigeria and Niger: a Qualitative Study. Diemert DJ, editor. *PLoS ONE*. 2014 Jun 27;9(6):e100038.
55. Fagbamigbe AF, Juma J, Kariuki J. Barriers to utilisation of oral rehydration Solution and zinc in managing diarrhoea among under-five children in Oyo State, Nigeria. *BMJ Paediatrics Open*. 2022 Jun;6(1):e001450.
56. Smith A, Hutchinson P, Eisele T, Keating J. Factors associated with household WASH practices, childhood diarrhea, and maternal care-seeking and treatment practices in northwestern Nigeria. A dissertation submitted on the second day of August 2024 to the Department of Tropical Medicine and Infectious Disease in partial fulfillment of the requirements of the School of Public Health and Tropical Medicine of Tulane University for the degree of Doctor of Philosophy.
57. City Population. Africa (State, Nigeria) - Population Statistics, Charts, Map and Location [Internet]. 2022 [cited 2025 May 28]. Available from: https://citypopulation.de/en/nigeria/admin/NGA012__edo/
58. Mapcarta. Egor [Internet]. Mapcarta. 2024. Available from: <https://mapcarta.com/29619204>

59. PopulationStat. Benin City, Nigeria Population (2025) - Population Stat [Internet]. Populationstat.com. 2025 [cited 2025 Jul 12]. Available from: <https://populationstat.com/nigeria/benin-city>
60. Atimati A, Adam V. Breastfeeding practices among mothers of children aged 1–24 months in Egor Local Government Area of Edo State, Nigeria. South African Journal of Clinical Nutrition. 2018 Jul 30;33(1):10–6.
61. Edo State Government. Strategic Health Plan II (SHDP II) 2018-2022: Towards actualizing the provisions of Basic Health Care Services [Internet]. Edo State Ministry of Health, Benin City, Nigeria; 2018 [cited 2023 Sep 20]. Available from: <https://ngfrepository.org.ng:8443/jspui/bitstream/123456789/3283/1/SECOND%20NATIONAL%20STRATEGIC%20HEALTH%20DEVELOPMENT%20PLAN%202018%20%E2%80%93%202022.pdf>
62. Macrotrends. Benin City, Nigeria Metro Area Population 1950-2024 [Internet]. Macrotrends.net. 2024. Available from: <https://www.macrotrends.net/global-metrics/cities/21981/benin-city/population>
63. World Health Organization; United Nations Children's Fund. WHO/UNICEF Joint Statement: Clinical management of acute diarrhoea. Geneva: World Health Organization; May 2004.
64. District: Okada District Zip Code | Nigeria Zip Codes [Internet]. Mycyber.org. 2025 [cited 2025 Jul 12]. Available from: https://geo.mycyber.org/nigeria/okada/#google_vignette

APPENDIX 1

INFORMED CONSENT FORM

TITLE OF STUDY

Knowledge, attitude, and practice of mothers in the management of acute watery diarrhea in under-five children in Benin City.

INSTITUTION

Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin, Benin City.

PRINCIPAL INVESTIGATORS

Ahamefule Chinonso Bright

Aiyanyor Smart Eloghosa

SUPERVISOR

Prof. Vivian Omuemu

FINANCIAL SPONSORSHIP

This research work is financially sponsored by the principal investigators.

PURPOSE OF RESEARCH

The purpose of this research work is to assess the knowledge, attitude, and practice of mothers in the management of acute watery diarrhea in under-five children in Benin City

PROCEDURES

You are kindly requested to complete a questionnaire designed to assess the knowledge, attitude, and practice of mothers in the management of acute watery diarrhea in under-five children in Benin City. This questionnaire is for research purposes only.

CONFIDENTIALITY

All information collected would be kept confidential and stored securely. Data collected would be anonymized and only accessible to the research team.

COMPENSATION

Participants will not receive any compensation for their participation.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. You may withdraw from the study at any time without any consequences.

RISKS

There are no risks associated with participation in this study.

BENEFITS

The information you provide will help us better understand how economic abuse affects women in marriage. This can help raise awareness and may inform future policies, support services, and community education efforts aimed at preventing economic abuse and supporting affected women.

CONTACT INFORMATION

If you have any questions or concerns regarding this research work please contact:

Ahamefule Chinonso Bright

Email: chinonsoahamefule29@gmail.com

Phone Number: 08079576787

Aiyanyor Smart Eloghosa

Email: aiyanyoreloghosa@gmail.com

Phone Number: 09060182374

OR

Ethics and Research Committee,

University of Benin Teaching Hospital,

Benin City.

Email: ubthresearchethics@gmail.com

Phone number: 07063331337

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

Please, sign below if you have agreed to participate in the study.

CERTIFICATION OF CONSENT

I, _____ having full capacity to consent for myself do thereby consent to my participation in the research study.

The methods and means by which the study will be conducted have been explained to me by Ethical Committee. I have been given the opportunity to ask questions concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Participant's Signature: _____

Date: _____

APPENDIX II

PROPOSED QUESTIONNAIRE

DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE

UNIVERSITY OF BENIN TEACHING HOSPITAL.

**KNOWLEDGE, ATTITUDE AND HOME MANAGEMENT PRACTICES OF ACUTE
WATERY DIARRHEA AMONG MOTHERS OF UNDER-FIVE CHILDREN IN BENIN
CITY**

Dear respondent,

We are 600L medical students at the University of Benin currently doing our one-year project. This study aims to assess the knowledge, attitude and home management practices of Acute Watery Diarrhea among mothers of under-five children in Benin city, Edo state, Nigeria.

Please kindly answer all questions as best as you can. There are no right or wrong answers and there is no penalty for opting out of the study at any time. Be assured that every information given to us will be treated with utmost confidentiality. Thank you.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Age as at last birthday (years): _____ years
2. Marital Status: ☐ Single ☐ Married ☐ Divorced ☐ Separated
3. Education Level: ☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary
4. Employment Status: ☐ Employed ☐ Unemployed
5. Occupation: _____
6. Religion: ☐ Christianity ☐ Islam ☐ Traditional ☐ Others (specify):

7. Tribe/Ethnic group: _____
8. Number of children under five: _____
9. Age of index child (months): _____
10. Sex of index child: ☐ Male ☐ Female
11. Household income (monthly, in Naira): _____
12. What is the main source of water used by your household? ☐ Piped water ☐ Borehole ☐
Protected well ☐ Unprotected well ☐ Surface water (e.g., river, lake) ☐ None

13. What kind of toilet facility does your household use? ☐ Flush toilet ☐ Pit latrine with slab ☐ Pit latrine without slab ☐ Open defecation ☐ None
14. Source of health information: ☐ Health worker ☐ Radio/TV ☐ Family ☐ Internet ☐ None ☐ Others (specify): _____

SECTION B: KNOWLEDGE ON DIARRHOEA

15. What is diarrhoea? ☐ Passage of loose stools once a day ☐ Passage of watery stools ≥ 3 times a day ☐ Don't know
16. Source of information about diarrhoea: ☐ Health worker ☐ Radio/TV ☐ Family ☐ Internet ☐ None ☐ Others (specify): _____
17. What are specific causes of diarrhoea in children? (Tick all that apply) ☐ Contaminated food/water ☐ Teething ☐ Dirty hands ☐ Poor sanitation ☐ Germs/viruses ☐ Evil spirits ☐ Others (specify): _____
18. How do you identify if a child has diarrhoea? ☐ Watery stools ☐ Frequent stools (≥ 3 times/day) ☐ Abdominal pain ☐ Lethargy ☐ All of the above ☐ Don't know
19. What are danger signs in a child with diarrhoea? (Tick all that apply) ☐ Sunken eyes ☐ No tears ☐ Inability to drink ☐ Fast breathing
20. Which signs indicate dehydration in a child with diarrhoea? (Tick all that apply) ☐ Sunken eyes ☐ Crying without tears ☐ Dry mouth ☐ Lethargy/unconsciousness ☐ Cold hands/feet ☐ Don't know
21. What complications can result from untreated diarrhoea? ☐ Dehydration ☐ Death ☐ Delayed growth ☐ None ☐ Don't know
22. How can diarrhoea in children be treated? (Tick all that apply) ☐ Oral Rehydration Solution (ORS) ☐ Zinc tablets ☐ Medical consultation ☐ Home remedies ☐ Don't know
23. When should diarrhoea be treated? ☐ Immediately ☐ After 1–2 days ☐ Only when child is weak
24. Have you heard of Oral Rehydration Solution (ORS)? ☐ Yes ☐ No

25. What is ORS used for? ☐ Cure diarrhoea ☐ Replace lost fluids ☐ Don't know

26. What ingredients are used to prepare home-made ORS? _____

27. How long should ORS be used after preparation? ☐ 12 hours ☐ 24 hours ☐ 48 hours ☐
Don't know

SECTION C: ATTITUDE TOWARDS MANAGEMENT

Instruction: Indicate your level of agreement using the scale:

(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

S/N	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
28.	Diarrhoea is a serious illness that can cause death in under-five children.					
29.	Diarrhoea can be managed effectively at home.					
30.	Herbal medicine is better than hospital treatment for diarrhoea.					

31.	Giving fluids during diarrhoea makes the child vomit more.					
32.	Continued feeding during diarrhoea is important.					
33.	Teething causes diarrhoea in children.					
34.	Seeking medical care early is necessary.					
35.	ORS is effective in treating diarrhoea.					
36.	I am confident in managing diarrhoea at home.					

37.	Diarrhoea is a normal part of child growth and doesn't need treatment.					
38.	Diarrhea caused by teething does not require medical attention.					
39.	ORS should only be given if a child has severe diarrhea.					

SECTION D: PRACTICES IN DIARRHOEA MANAGEMENT

Section D.1: Experience with Acute Watery Diarrhoea

40. Has any of your children under five years old had acute watery diarrhoea (frequent, loose, watery stools) in the past 12 months?

☐ Yes ☐ No (If No, skip to Section D: Preventive Practices)

41. If yes, how many episodes of diarrhoea did your child/children have in the past 12 months?

___ episodes

42. For the most recent episode, how long did the diarrhoea last?

☐ Less than 1 day ☐ 1–3 days ☐ 4–7 days ☐ More than 7 days ☐ Don't know

Section D.2: Management Practices for Acute Watery Diarrhoea

43. What was the first action you took when you noticed your child had acute watery diarrhoea? (Select one)
- ☐ Gave home remedies (e.g., salt-sugar solution, herbal medicine) ☐ Gave ORS (oral rehydration salts) ☐ Took the child to a health facility (e.g., hospital, clinic) ☐ Took the child to a pharmacy/chemist ☐ Consulted a traditional healer/herbalist ☐ Did nothing ☐ Other (specify): _____
44. Did you give your child oral rehydration salts (ORS) to treat the diarrhoea?
- ☐ Yes ☐ No (If No, skip to Q14)
45. If yes, how did you prepare and administer the ORS? (Open-ended)
- _____
- _____
46. Did you give your child zinc supplements (e.g., zinc tablets or syrup) during the diarrhoea episode?
- ☐ Yes ☐ No (If No, skip to Q16)
47. If yes, for how many days did you give the zinc supplements?
- ☐ Less than 5 days ☐ 5–10 days ☐ 10–14 days ☐ More than 14 days ☐ Don't know
48. Did you give your child any of the following during the diarrhoea episode? (Check all that apply)
- ☐ Antibiotics (e.g., metronidazole, amoxicillin) ☐ Antimotility drugs (e.g., loperamide) ☐ Herbal or traditional medicines ☐ Other medicines (specify): _____ ☐ None of the above
49. If you used any medicines (e.g., antibiotics, herbal remedies), where did you obtain them? (Check all that apply)
- ☐ Hospital/Clinic ☐ Pharmacy/Chemist ☐ Traditional healer ☐ Market ☐ Neighbor/Family ☐ Other (specify): _____ ☐ Not applicable
50. Did you seek advice or treatment from any of the following for your child's diarrhoea? (Check all that apply)
- ☐ Hospital/Clinic ☐ Pharmacy/Chemist ☐ Traditional healer/Herbalist ☐ Community health worker ☐ Family/Friends ☐ Did not seek advice or treatment ☐ Other (specify): _____

51. If you sought treatment from a health facility, how soon after the diarrhoea started did you visit?
☐ Same day ☐ 1–2 days ☐ 3–5 days ☐ More than 5 days ☐ Did not visit a health facility
52. During the diarrhoea episode, did you change your child's feeding practices in any of the following ways? (Check all that apply)
☐ Continued breastfeeding as usual ☐ Increased breastfeeding ☐ Reduced breastfeeding ☐ Stopped breastfeeding ☐ Continued giving food as usual ☐ Increased food ☐ Reduced food ☐ Stopped giving food ☐ Increased fluids (e.g., water, juice) ☐ Reduced fluids ☐ Stopped giving fluids ☐ Other (specify):

Section D.3: Preventive Practices

53. What do you usually do to prevent diarrhoea in your child/children? (Check all that apply)
☐ Exclusive breastfeeding for the first 6 months ☐ Handwashing with soap and water before feeding the child ☐ Handwashing with soap and water after changing diapers ☐ Proper disposal of faeces (e.g., in a toilet/latrine) ☐ Boiling or treating drinking water ☐ Ensuring child receives rotavirus vaccine ☐ Other (specify):
 _____ ☐ Nothing specific
54. Do you have a designated handwashing area with soap and water in your home?
☐ Yes ☐ No
55. Has your child/children under five received the rotavirus vaccine?
☐ Yes ☐ No ☐ Don't know
56. Where do you usually dispose of your child's faeces? (Select one)
☐ Toilet/Latrine ☐ Dustbin/Gutter ☐ Open disposal (e.g., bush, backyard) ☐ Other (specify): _____

SECTION E: ACCESS BARRIERS TO HEALTHCARE

57. Do you seek treatment from a health facility (e.g., hospital, clinic) when your child has acute watery diarrhoea?
☐ Yes ☐ No
58. If no, why do you not seek treatment from a health facility? (Check all that apply)
☐ Lack of money ☐ Long distance to facility ☐ Child usually recovers on their own
☐ Spouse/partner disapproval ☐ Preference for traditional care ☐ Negative experiences with health workers (e.g., rudeness) ☐ Drugs not available at facility ☐
 Other (specify): _____
59. How long does it take to reach the nearest health facility from your home?
☐ Less than 30 minutes ☐ 30–60 minutes ☐ More than 1 hour
60. Is oral rehydration salts (ORS) available at your nearest health facility or pharmacy?
☐ Yes ☐ No ☐ Don't know
61. Is zinc supplementation (e.g., tablets, syrup) available at your nearest health facility or pharmacy?
☐ Yes ☐ No ☐ Don't know
62. Have you received health education on managing acute watery diarrhoea in children?
☐ Yes ☐ No (If No, skip to Q8)
63. If yes, what was the source of the health education? (Check all that apply)
☐ Health worker ☐ Community health worker ☐ Friend/Family ☐ Media (e.g., radio, TV) ☐ Workshop/Training ☐ Other (specify): _____
64. Do cultural or traditional beliefs influence your decision to seek treatment from a health facility for your child's diarrhoea?
☐ Yes (specify, e.g., preference for traditional healers, spiritual beliefs): _____
☐ No
65. Has lack of transportation ever prevented you from taking your child to a health facility for diarrhoea treatment?
☐ Yes ☐ No
66. Have you ever been denied care or faced challenges (e.g., long wait times, unavailable staff) at a health facility when seeking treatment for your child's diarrhoea?
☐ Yes (specify): _____ ☐ No

APPENDIX III

List of Wards in Egor LGA⁵⁸

1. Ugbowo
2. Okhoro
3. Uwelu
4. Urelu I
5. Urelu II
6. Ogida I
7. Ogida II
8. Useh
9. Egor
10. Evbuotubu

List of Wards in Ovia North East LGA⁵⁸

1. Okada East
2. Okada West
3. Okada Central
4. Iguoshodin–Neke–Ogheghe
5. Uhen
6. Uhiere
7. Odighi–Okokhuo
8. Ofunama
9. Ogbese
10. Okokhuo–Oduna
11. Utoka
12. Oluku
13. Iguoriakhi

APPENDIX IV

A. Selected Streets in Uwelu Ward

Total number of registered streets provided:⁶² 56

Randomly selected 10 streets:

1. Agho Street
2. Ighadara Street
3. Uwagbue Street
4. Eweka Eyeye Street
5. Omigie Street
6. Ibuje Avenue
7. Ihoeghan Street
8. Ovbieko Road
9. Uwelu Road
10. Omoregie Street

B. Selected Streets in Ugbowo Ward

Total number of registered streets provided:⁶² 14

Final randomly selected 10 streets:

1. Adolo College Road
2. Brodnicks Street
3. Aikhionbare Street
4. Otakhoigboge Street
5. Igbinoba Street
6. Akposare Street
7. Eaglet Street
8. Momoh Street
9. Okungbowa Street
10. Akugbe Street

C. Selected Streets in Oluku Ward

Total number of registered streets provided:⁶² 13

Randomly selected 10 streets:

1. 1st Street
2. 2nd Avenue
3. 4th Avenue
4. 6th Avenue
5. 8th Avenue
6. Akhimien Road
7. Boundary Road
8. First Avenue
9. Iguosa Housing Estate Road
10. 5th Avenue

D. Selected Streets in Okada Ward

Total number of registered streets provided:⁶² 26

Randomly selected 10 streets:

1. Ofumwgbe Camp
2. Oghobahon I
3. Okoro
4. Ugbokun I
5. Ulakpa Junction
6. Ekenomeghele
7. Guobadia Camp
8. Igueze
9. Igunye
10. Iguomo

APPENDIX V

GANTT CHART

The study was carried out between December 2024 and April 2026. The timeline is represented in the Gantt chart below:

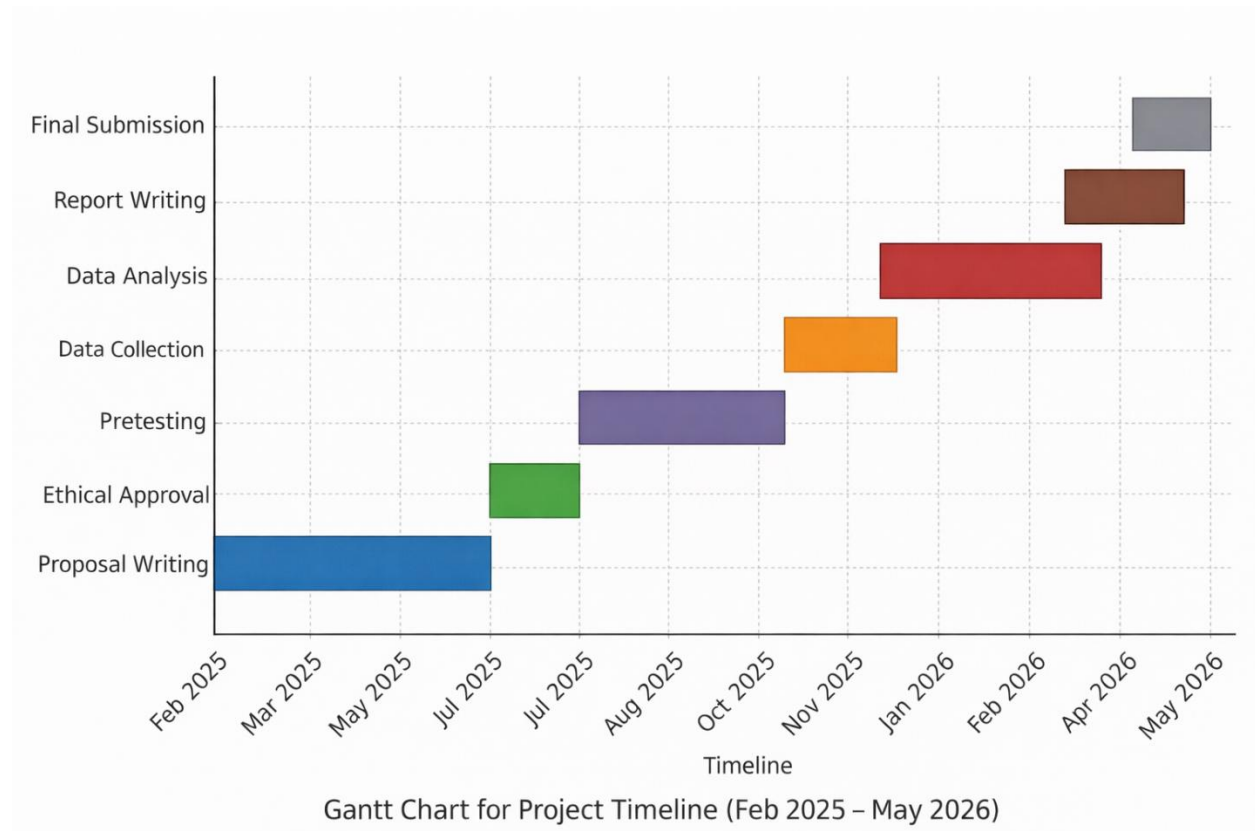


Fig 1. Gantt Chart for Project Timeline (Feb 2025 - Mar 2026)

APPENDIX VI

ETHICAL CLEARANCE

 HEALTH RESEARCH ETHICS COMMITTEE (HREC)		
UNIVERSITY OF BENIN TEACHING HOSPITAL P.M.B. 1111 BENIN CITY NIGERIA Telephone: 052 600418 Website: ubth.org		
CHIEF MEDICAL DIRECTOR Prof. (Mrs) I.N Ize-Iyamu	DIRECTOR OF ADMINISTRATION Jim Uwadi, Esq	CHAIRMAN Prof. (Mrs.) Antoinette N. Ofili
HREC OFFICE: Committee email: ubthresearchethics@gmail.com Registration Number: NHREC-UBTH-HREC/24/12/2022B		

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486549127258
PROPOSAL TITLE: "KNOWLEDGE, ATTITUDE AND HOME MANAGEMENT PRACTICES OF ACUTE WATERY DIARRHEA AMONG MOTHERS UNDER-FIVE CHILDREN IN BENIN CITY"

PRINCIPAL INVESTIGATOR(S): AHAMEFULE CHINONSO BRIGHT, AIYANYOR SMART ELOGHOSA

DEPARTMENT/INSTITUTION: DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

DATE CONSIDERED: JANUARY 27TH, 2026
DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 27/01/2026 TO 26/01/2027. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE: *Prof. A.N. Ofili* 27/01/2026

SUPERVISOR (S): PROF. VIVIAN OMUEMU

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
are to furnish the committee with the research activities at the completion of the study. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification.

Signature & Date: *Eloghosa* 27/01/26

 ubthresearchethics@gmail.com Registration Number: NHREC/24/01/2020

APPENDIX VII

PLAGIARISM TEST CERTIFICATE

INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria



CLEARANCE FORM

DATE: 11/05/26

NAME: AHARIFULE BRIGHT CHINORISO

MATRIC NO: MED1807360

DEPARTMENT: MEDICINE & SURGERY

FACULTY: MEDICINE

SESSION OF GRADUATION: 2023/2026

DIRECTOR
DATE: 11/05/26
IPTTO (VCO)
UNIBEN BENIN CITY
Head Of Unit (IPTTO)

INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria



CLEARANCE FORM

DATE: 11/05/26

NAME: AITANYOR SMART ELOGHOSA

MATRIC NO: MED1807362

DEPARTMENT: MEDICINE & SURGERY

FACULTY: MEDICINE

SESSION OF GRADUATION: 2023/2026

DIRECTOR
DATE: 11/05/26
IPTTO (VCO)
UNIBEN BENIN CITY
Head Of Unit (IPTTO)