HOUSEHOLD MANAGEMENT OF CHILDHOOD DIARRHOEA IN OVIA NORTH EAST LOCAL GOVERNMENT AREA, EDO STATE NIGERIA

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

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DEDICATION

This project is dedicated first and foremost to God Almighty, whose grace, wisdom, abundant strength and unfailing mercies enabled us to successfully complete this work.

We extend this dedication to our supervisor, Prof. V.Y. Adam for his guidance and support throughout this project and also to the caregivers who participated in the study, without whom this research would not have been possible.

We also dedicate this study to our beloved families and friends, whose unwavering support, sacrifices, and guidance have been the foundation of our education and personal growth.

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EGHAREVBA OSARUMEN MARY

I am very grateful to God Almighty for his continued help throughout this work.

AYO-YINUSA TOSIN

DECLARATION

We hereby declare that this research project titled **"Household Management of Childhood Diarrhoea in Ovia North East Local Government Area, Benin City"** was conducted under supervision and has not been submitted in part or in full for any purpose.

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CERTIFICATION

This is to certify that this research study titled **"Household Management of Childhood Diarrhoea in Ovia North East Local Government Area, Benin City"** was conducted by **EGHAREVBA OSARUMEN MARY** with matriculation number **MED1807391** and **AYO-YINUSA TOSIN** with matriculation number **MED1807377** under the supervision of Prof. V.Y. Adam 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.

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LIST OF ABBREVIATIONS

AOR – Adjusted Odds Ratio

CI – Confidence Interval

DALYs – Disability-Adjusted Life Years

EDHS – Ethiopian Demographic and Health Survey

HBM – Health Belief Model

iCCM – Integrated Community Case Management

LGA – Local Government Area

ORS – Oral Rehydration Solution

ORT – Oral Rehydration Therapy

PCR – Polymerase Chain Reaction

PET – Polyethylene Terephthalate

PHC – Primary Health Care

qPCR – Quantitative Polymerase Chain Reaction

SDG – Sustainable Development Goal

SODIS – Solar Water Disinfection

U5 – Under five

UBTH – University of Benin Teaching Hospital

WASH – Water, Sanitation, and Hygiene

WHO – World Health Organization

OPERATIONAL DEFINITION OF TERMS

Antibiotic resistance – A condition where bacteria change in response to antibiotic use, reducing drug effectiveness and making infections harder to treat.

Caregiver – A parent, guardian, or individual responsible for the daily care of a child under five.

DALY (Disability-Adjusted Life Year) – A measure quantifying disease burden, combining years of life lost due to premature death and years lived with disability.

Dehydration – Excessive loss of body fluids (e.g., from diarrhoea), causing symptoms like thirst, dry mouth, and reduced urination.

Diarrhoea – Passage of three or more loose/liquid stools per day (or more frequent than normal for the individual).

Home-based management – Caregiver practices to treat childhood diarrhoea at home, including fluid replacement and feeding adjustments.

Household water treatment – Methods (e.g., chlorination, SODIS) to purify drinking water and prevent diarrhoeal diseases.

Integrated Community Case Management (iCCM) – A strategy delivering treatment for childhood illnesses (e.g., diarrhoea, malaria) at the community level in low-resource settings.

Knowledge-practice gap – Discrepancy between caregivers' awareness of correct diarrhoea management and their actual practices.

Oral Rehydration Solution (ORS) – A WHO-recommended mix of electrolytes and glucose to treat dehydration from diarrhoea.

Oral Rehydration Therapy (ORT) – Treatment for dehydration involving intake of water mixed with salts and glucose.

Pneumonia – Respiratory infection inflaming lung air sacs, caused by bacteria/viruses/fungi and a leading cause of child mortality.

Polyethylene Terephthalate (PET) – Durable plastic used for bottles, suitable for solar water disinfection.

Self-medication – Use of non-prescribed medicines (e.g., antibiotics) without professional consultation.

Solar Water Disinfection (SODIS) – Low-cost water purification using sunlight and PET bottles to kill pathogens.

Traditional remedies – Non-medical treatments (e.g., herbal concoctions) used for diarrhoea management.

Under-five children – Children aged 0–59 months, highly vulnerable to diarrhoeal diseases.

Water, Sanitation, and Hygiene (WASH) – Interventions improving clean water access, sanitation, and hygiene to reduce disease.

World Health Organization (WHO) – Global body setting health standards and guiding disease prevention.

ABSTRACT

BACKGROUND

Childhood diarrhoea remains a major cause of morbidity and mortality among under-five children, especially in low-resource settings where poor sanitation, limited access to safe water, and inappropriate home care practices persist.

OBJECTIVE

This study assessed household management of childhood diarrhoea in Ovia North East Local Government Area, Benin City, in order to provide evidence for interventions that will improve home-based care and reduce complications among under-five children.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted among 436 caregivers of under-five children residing in Ovia North East Local Government Area, Benin City, Edo State. Data were collected using interviewer-administered structured questionnaires adapted from United Nations Children's Fund and World Health Organization tools on childhood diarrhoea management. Data collected were entered and analysed using IBM SPSS version 25.0, with statistical significance set at $p < 0.050$ and 95% confidence interval.

RESULTS

Mean age of respondents studied was 39.2 ± 10.6 years, and the majority were females 371 (85.1%). More than half of caregivers 232 (53.2%) correctly defined diarrhoea as passage of three or more loose or watery stools in 24 hours, while 228 (52.3%) identified danger signs of dehydration. Almost half of the under-five children 212 (48.6%) had experienced diarrhoea in the two weeks preceding the survey, and 101 (47.6%) of these passed stool three times or more in 24 hours. Blood in stool was reported in 56 (26.4%) of diarrhoeal episodes. In the six months

preceding the study, 143 (32.8%) had experienced two episodes of diarrhoea, while 104 (23.9%) had experienced three or more episodes. Utilization of recommended management options was poor, with only about one-quarter of caregivers giving oral rehydration solution during diarrhoeal episodes and an even smaller proportion giving zinc. Feeding practices were also suboptimal, as slightly more than half of caregivers had poor feeding practices during diarrhoea. Furthermore, family type ($\chi^2 = 14.685$; $p < 0.001$), monthly income ($\chi^2 = 7.430$; $p = 0.024$), household size ($\chi^2 = 6.867$; $p = 0.009$), and spouse occupation skill level ($\chi^2 = 4.844$; $p = 0.028$) were identified as significant factors associated with household management of childhood diarrhoea.

CONCLUSION

Childhood diarrhoea was common among under-five children in Ovia North East LGA, with many children experiencing recent and recurrent episodes. Care-seeking practices among caregivers were suboptimal, as delays in seeking appropriate healthcare and reliance on non-recommended treatment sources were observed. Utilization of recommended home management options, particularly Oral Rehydration Solution (ORS) and zinc supplementation, was poor, while feeding and fluid practices during diarrhoeal episodes were inadequate among many caregivers. Household management of childhood diarrhoea was significantly influenced by socioeconomic and family-related factors such as family type, monthly income, household size, and spouse occupation skill level. These findings highlight the need for targeted health education, improved access to ORS and zinc, promotion of appropriate feeding practices, and strengthened water, sanitation, and hygiene interventions to reduce the burden of childhood diarrhoea among under-five children.

KEYWORDS: Childhood diarrhoea, Household management, Caregivers, ORS, Zinc, Ovia North East.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Diarrheal disease poses a major global health challenge, especially for children under five. Despite progress in reducing mortality in this age group, diarrhoea remains a leading cause of sickness and death. It causes hundreds of thousands of deaths yearly and contributes significantly to disability adjusted life years lost due to preventable childhood illness. In countries like India, diarrhoea is a major cause of child illness, especially among vulnerable and undernourished populations[1]. Diarrhoea is a big health problem, especially for young children. In poorer countries, families often don't treat diarrhoea at home following the guidelines of the World Health Organization (WHO). They may not give the right home care, like oral re-hydration therapy (ORT). For instance, a study in Iraq showed that only 24% of kids with diarrhoea got this treatment at home instead, almost 70% got antibiotics without a doctor's prescription[2]. This shows that caregivers may not know enough or have access to the right health services which also raises concerns about antibiotic resistance because antibiotics are being used too much[2].

Poorly managed diarrhoea can cause more than dehydration as seen in an Ethiopian study that found children with recent diarrhoea were ten times more likely to get pneumonia than those without which emphasizes the importance of proper home diarrhoea management to prevent further health issues[3]. Besides medical issues, environmental factors greatly affect diarrhoea. The WHO links diarrhoea to unsafe water, poor sanitation, and inadequate hygiene[4]. These problems are common in sub-Saharan Africa, where infrastructure hinders disease control. In Nigeria, diarrhoea is a major cause of child deaths, with prevalence as high as 18.8% nationally and 8% in states like Cross River[5].

Socioeconomic and educational differences worsen the problem. Nigerian studies show that households using unsafe water sources have more diarrhoea cases than those with safe water[6]. Also, a mother's education level strongly predicts how well diarrhoea is managed. Yet, many Nigerian families manage diarrhoea poorly, even when caregivers have some knowledge[7]. Although, many caregivers understand the causes and symptoms of diarrhoea, proper home management practices like ORT and hygiene are not consistently applied[7]. This gap is seen across different regions, where self-medication is common and medical care is often not sought[5].

Simple, low-cost solutions like water chlorination and Solar Water Disinfection (SODIS) can reduce diarrhoea, but their use in Nigeria remains limited due to low awareness and promotion[8]. SODIS also effectively kills pathogens in household water using sunlight and Polyethylene Terephthalate (PET) bottles[9]. Cultural beliefs and experiences also matter as a study done in Aba, Nigeria found that caregivers' childhood feeding experiences influenced their current choices, with many avoiding traditional foods for processed, sugary options[10]. These choices can hinder recovery during diarrhoea and increase malnutrition risk. The structure of healthcare financing presents additional challenges.

In many rural areas of Nigeria, Integrated Community Case Management (iCCM) programmes play a vital role in treating childhood illnesses like diarrhoea. However, these programmes depend heavily on donor funding and often struggle to remain sustainable. For example, in Niger State, although 93% of community members expressed willingness to support iCCM financially, more than half could contribute less than 1,000 naira per year[11]. This reflects a gap between community needs and their capacity to fund essential services. In Uganda, regional differences in access to diarrhoea care emphasize the importance of tailoring programs to specific local contexts. Data revealed that 45% of children received less fluid and 58% received

less food during diarrhoeal episodes[12]. These statistics point to on-going gaps in caregiver knowledge, infrastructure, and cultural practices that limit effective home-based care[12].

In Ovia North-East Local Government Area (LGA), Nigeria, these issues are likely even more pronounced due to weak infrastructure, limited health education, and widespread poverty. Despite the significant disease burden, little community-level data exists on how households manage childhood diarrhoea. Understanding caregivers' treatment methods, beliefs, feeding practices, and health-seeking behaviour is essential for designing effective, culturally appropriate interventions that can reduce illness and death from diarrhoea in young children.

1.2 STATEMENT OF PROBLEM

Despite the proven effectiveness of simple interventions such as giving enough fluids, continuing feeding, and providing zinc many communities still manage childhood diarrhoea poorly. In several regions, including parts of Nigeria, caregivers often delay or skip oral rehydration, reduce feeding and breastfeeding, and use inappropriate treatments like un-prescribed antibiotics. These actions increase the risk of dehydration and complications[2]. In semi-urban and rural areas like Ovia North-East LGA, poor access to formal healthcare worsens the problem. Inadequate household practices likely contribute to the continued high rates of illness and death from diarrhoea.

In addition, evidence shows that recent diarrhoeal episodes increase a child's risk of other infections like pneumonia, indicating that poor care has lasting effects beyond the initial illness[3]. For example, a Lagos study found that many mothers knew diarrhoea symptoms and causes, but only half used correct home care like ORT, continued feeding, and hygiene[7]. This knowledge gap exists elsewhere too. In Calabar-South, 98.2% of caregivers knew about

diarrhoea, but only 14.3% sought medical help and 42% self-medicated[5]. Simple, affordable solutions can help reduce diarrhoea in low-resource settings.

An Ethiopian trial showed that household water chlorination reduced diarrhoea by 36%[8]. Despite success in pilot programs, SODIS awareness and use in Nigeria are limited due to lack of promotion[9]. Although people in Nigeria know about preventing and treating diarrhoea, many do not apply this knowledge. In Ovia North-East LGA, poor access to clean water and healthcare leads caregivers to use home remedies that do not meet global standards[13].

Several studies highlight the issues such as knowledge-practice gap: although oral rehydration therapy and continued feeding are well-known, caregivers in countries like Ethiopia and Iraq often reduce fluid intake or misuse antibiotics during diarrhoeal illness[2,14]. Other factors like income, maternal education, and location affect how diarrhoea is managed, as seen in Uganda[12]. Finally, there is little data specific to Ovia North-East LGA, making it hard to plan local responses effectively. Research shows that community health education improves care-seeking behaviour and WASH (water, sanitation, and hygiene) programs can reduce diarrhoea rates significantly[2,12,14]. With targeted education and supportive policies, gaps between knowledge and practice can be narrowed, improving care in communities.

Despite on-going efforts such as national and international WASH initiatives including improving access to safe drinking water, promoting hand washing and hygiene, strengthening sanitation facilities and encouraging the use of household water-treatment, diarrhoea continues to cause 16% of child deaths each year in Nigeria because many communities still lack clean water, proper sanitation, and basic hygiene materials conditions linked to recurring diarrhoeal illness[6,9] . Caregivers in rural areas often lack the training and tools needed to manage diarrhoea at home effectively. Even in more urban areas like Lagos, household practices often do not match medical advice. One study showed that although many mothers knew about proper care,

only half used ORT, continued feeding, or maintained hygiene during diarrhoeal episodes. The situation is likely worse in places like Ovia North-East LGA, where healthcare services are weaker and education levels are lower[7]. The persistence of diarrhoea among children is tied to environmental risks, caregiver practices, and health system challenges[1].

In addition, early negative feeding experiences cause some caregivers to replace healthy meals with processed foods, falling short of WHO nutrition guidelines[10]. In rural communities, the sustainability of Integrated Community Case Management (iCCM) is threatened by its reliance on donor funding. Although, many caregivers are willing to pay for these services, most can only afford small amounts far below what is needed to maintain the programs. Without long-term funding and better home practices, children under five remain at high risk of avoidable illness and death[11].

Finally, even when caregivers are aware of proper care, they may still choose informal treatment options. In Calabar-South, only 14.3% of caregivers with good knowledge sought professional help. Most turned to unverified sources like traditional healers, churches, or local medicine vendors[5]. This shows that awareness alone is not enough especially in low-income areas like Ovia North-East LGA, where similar behaviours are likely. The continued gap between what caregivers know and what they do highlights the urgent need for local research. Studying household practices in Ovia North-East LGA will support the development of targeted, practical solutions to improve child health and reduce deaths from diarrhoea[5].

1.3 JUSTIFICATION OF THE STUDY

Household care is often the first and only response to childhood diarrhoea, especially in underserved areas like Ovia North-East LGA. Understanding caregiver behaviour at home is key to designing culturally appropriate and effective health interventions. A study done in Thi-Qar Governorate, Iraq in 2020 showed high misuse of antibiotics and low use of oral rehydration therapy (ORT) reflect significant knowledge and practice gaps[2]. In Ethiopia, studies show that children with recent episodes of diarrhoea face a higher risk of developing community-acquired pneumonia[3]. This underscores the broader health risks linked to poor home-based diarrhoea care and the need to strengthen household management to prevent complications and save lives.

Despite years of health campaigns, diarrhoea remains a major cause of death among Nigerian children under five. Poor household practices, inadequate sanitation, and lack of access to clean water continue to drive these preventable deaths[13]. This study aims to generate local data from Ovia North-East LGA to inform targeted improvements in home care. Although many Nigerians are aware of diarrhoea prevention and treatment, there is a persistent gap between knowledge and action. In Ovia North-East LGA, poor access to clean water and healthcare means caregivers often rely on home remedies that do not meet global standards[13].This gap is not only due to limited knowledge but also influenced by environmental, cultural, and infrastructure challenges. Understanding which home practices are effective can guide targeted interventions that build on what caregivers already do[13]. Proven strategies from other low-resource countries, such as household water chlorination, have significantly reduced diarrhoea rates[8]. In Nigeria, better access to clean water and healthcare has shown positive results. Studying current practices and barriers in Ovia North-East LGA will support practical public health responses[13].

This study is justified for several reasons; It's public health importance as diarrhoea remains a major cause of child mortality in Nigeria. Local data can help reduce these deaths[2,14], Findings from the study will guide local programs, including education and improvements in WASH[2,12,14], The study also aligns with Sustainable Development Goals (SDG) 3 (Good Health) and 6 (Clean Water and Sanitation)[2,12,14] and finally, lessons from Iraq[2], Ethiopia[14], and Uganda[12] can be adapted for sustainable local solutions. In Nigeria, the difference between what caregivers know and what they practice is still a major challenge. Even when they understand diarrhoea causes and symptoms, their responses often fall short especially in areas lacking basic services[6,7,9].

Addressing local challenges is essential to closing this knowledge practice gap. Low-cost methods like solar water disinfection (SODIS) can significantly reduce diarrhoea when adopted properly[9]. This study will determine current household practices and caregivers' willingness to adopt such interventions. Caregiver beliefs and past experiences also influence how children are fed and treated during illness. Some avoid recommended feeding due to previous negative experiences, instead offering unhealthy alternatives like sugary drinks[10]. Financial barriers further restrict access to proper care. While programs like integrated community case management (iCCM) help, they rely heavily on donor support and lack sustainability[10].

This study will examine diarrhoea prevalence, care-seeking patterns, treatment choices, feeding practices, and related factors. It will guide the development of caregiver and community-led interventions to improve household care and reduce under-five deaths in Ovia North-East LGA and similar communities. Data from Calabar-South shows that even knowledgeable caregivers often do not seek professional help. Most prefer informal sources like patent medicine vendors, religious centres, or traditional healers[5]. Similar patterns may exist in Ovia North-East LGA. Investigating this area will help identify local factors shaping

caregiver decisions. By analysing real-life caregiver actions and the challenges they face, this study will offer practical, culturally appropriate recommendations. These insights will help close the gap between knowledge and behaviour, improve diarrhoea outcomes, and strengthen community health systems[5].

1.4 RESEARCH QUESTIONS

1. What is the prevalence of diarrhoea among children under five years in Ovia North East?
2. What are the patterns of care-seeking behaviour among caregivers when their children under 5 years' experience diarrhoea?
3. What treatment options and home remedies do caregivers utilize for managing childhood diarrhoea?
4. What feeding practices are adopted by caregivers when feeding children with diarrhoea?
5. What demographic socioeconomic or health care related factors are associated with the management of diarrhoea conditions by caregivers?

1.5 RESEARCH OBJECTIVES

Aim : To assess current household practices in managing childhood diarrhoea and to identify factors influencing these practices with the goal of developing targeted recommendations to improve home-based care and reduce morbidity among affected children.

Specific objectives :

1. Determine the proportion of children under 5- years with diarrhoea in Ovia North East LGA
2. Ascertain the care-seeking for the management of diarrhoea of children under 5-years by care givers in Ovia North East LGA
3. Identify the options utilized for the management of childhood diarrhoea by caregivers in Ovia North East LGA
4. Determine the feeding practices of children with childhood diarrhoea by caregivers in Ovia North East LGA
5. Identify the factors associated with management of diarrhoeal conditions by caregivers in Ovia North East LGA

CHAPTER TWO

LITERATURE REVIEW

Childhood diarrhoea remains a leading cause of morbidity and mortality among children under five, particularly in low- and middle-income countries where access to clean water, sanitation, and healthcare is limited[3]. Effective household management of diarrhoea is critical to reducing complications and preventing deaths, yet practices vary widely depending on socioeconomic, environmental, and behavioural factors[6]. This literature review examines key determinants of diarrhoea management in households, drawing insights from recent studies in Nigeria and Ethiopia. The reviewed articles highlight the role of water source quality[6], sanitation practices[13], and healthcare-seeking behaviour[3] in influencing diarrhoea outcomes. Additionally, innovative low-cost interventions, such as solar water disinfection[9], demonstrate potential for improving household water safety. By synthesizing these findings, this review aims to identify gaps and opportunities for enhancing diarrhoea management strategies at the household level, ultimately contributing to better child health outcomes.

2.1. PROPORTION OF CHILDREN UNDER 5 YEARS WITH DIARRHOEA

A descriptive cross-sectional study conducted in Calabar-South, Cross River State, Nigeria, between 2018 and 2019 aimed to assess caregivers' knowledge of childhood diarrhoea and their health-seeking practices[5]. This descriptive cross-sectional survey involved 660 caregivers of children under five years of age. A multi-stage random sampling technique was used, selecting wards, then streets, compounds, and finally households. Data were collected using semi-structured questionnaires[5]. The study found that 327 (50.3%) of caregivers reported that their under-five children had experienced diarrhoea. Despite 638 (98.2%) of the caregivers having good knowledge of diarrhoea prevention, only 45 (14.3%) sought hospital care when their children had diarrhoea, while 132 (42%) resorted to self-medication[5]. The study identified poor

sanitation and limited healthcare access as key factors influencing care-seeking behaviour. Another relevant investigation is a multi-country surveillance study conducted from 2017 to 2018. This analytical cross-sectional surveillance aimed to determine the aetiology and incidence of diarrhoea requiring hospitalization in children under five years of age across 28 low- and middle-income countries, including Nigeria[15]. The study involved 33 sentinel hospitals in 28 countries, where 29,502 children under five who were hospitalized for diarrhoea were enrolled, and stool samples from 5,465 of them were tested using quantitative PCR. The findings revealed that rotavirus was the leading cause of diarrhoea hospitalizations 1820(33.3%), followed by Shigella 530(9.7%) and norovirus 355(6.5%). Specifically in Nigeria, diarrhoea continues to be a major cause of hospital admissions among under-five children, with contaminated water and poor sanitation identified as significant risk factors[15].

A global perspective is provided by a systematic review that covered studies published from 2005 to 2020[16]. This literature review synthesized data from 61 studies aimed at analysing the global burden, causes, and interventions for childhood diarrhoea. The review included findings from multiple regions, including Nigeria, and incorporated studies retrieved through a systematic search of databases such as PubMed, CINAHL, Web of Science, and Google Scholar[16]. The study highlighted that Nigeria has one of the highest childhood diarrhoea mortality rates globally, with an estimated 151,700 annual deaths[16]. The main contributors to this burden were identified as open water sources, poor hygiene practices, and lack of adequate sanitation. The review emphasized the importance of rotavirus vaccination and improved Water, Sanitation, and Hygiene (WASH) interventions in reducing the prevalence of diarrhoea[16]. A systematic review and meta-analysis conducted in 2018 aimed to estimate the pooled prevalence of diarrhoea and its determinants among under-five children in Ethiopia[17]. The review included 22,744 children from 31 studies conducted in multiple regions, including Afar, Somali, Amhara, and Addis Ababa. These studies were observational in nature,

comprising cross-sectional, case-control, and cohort designs[17]. A systematic search of international databases such as PubMed, Web of Science, and EMBASE was conducted to identify relevant studies, and standardized data extraction methods were employed. The findings revealed a pooled prevalence of diarrhoea among under-five children of 22% (95% CI: 19–25%)[17]. The highest prevalence was recorded in Afar (27%), followed by Somali and Dire Dawa (26%). Key determinants of diarrhoea included lack of maternal education (OR: 2.5), absence of latrines (OR: 2.0), urban residence (OR: 1.9), and poor handwashing practices (OR: 2.2)[17]. These results suggest that if similar risk factors such as poor sanitation, low maternal education, and inadequate hygiene exist in Ovia North East, then diarrhoea prevalence in the area may also be high. Therefore, targeted interventions including hygiene education and improved sanitation infrastructure could help to reduce the burden of diarrhoea[17].

Another relevant study was an analytical cross-sectional hospital-based surveillance conducted from 2017 to 2018 across 28 low- and middle-income countries, including Nigeria[15]. The aim was to determine the leading causes of diarrhoea requiring hospitalization in children under five years of age. The study involved 29,502 hospitalized children, with stool samples from 5,465 tested using quantitative PCR (qPCR) for 16 diarrhoeal pathogens[15]. Surveillance hospitals randomly selected stool samples for laboratory analysis. The results indicated that rotavirus was the most common cause of diarrhoea hospitalizations, accounting for 33.3% of cases. This was followed by Shigella (9.7%), norovirus (6.5%), and adenovirus (5.5%)[15]. It was also noted that Shigella was more prevalent in older children between 24 and 59 months of age. Importantly, in areas where rotavirus vaccination had been introduced, there was an approximate 50% reduction in diarrhoea-related hospitalizations[15].

2.2. CARE SEEKING FOR THE MANAGEMENT OF DIARRHOEA OF CHILDREN UNDER 5 YEARS BY CAREGIVERS

A community-based analytical cross-sectional study conducted in Dangila Zuria Woreda, Northwest Ethiopia in 2018 aimed to assess health care-seeking behaviour and associated factors among mothers and caregivers of under-five children with acute diarrhoea. The study included 624 participants, selected through systematic random sampling[18]. Ten kebeles were selected via a lottery method, and households were chosen systematically. Data were collected through face-to-face interviews using structured questionnaires[18]. The study found that 485 (77.7%) of caregivers sought care from health facilities, with 565 (90.5%) utilizing government health centres. Key factors influencing care-seeking behaviour included higher education levels—specifically, caregivers with primary education had increased odds of seeking care (AOR = 2.0, 95% CI: 1.1–3.9)[18]. Male children were more likely to be taken for treatment (AOR = 1.7, 95% CI: 1.1–2.6). The severity of illness strongly influenced care-seeking, with a significant association (AOR = 7.5, 95% CI: 3.7–15.2). Additionally, proximity to health facilities improved the likelihood of seeking care (AOR = 2.4, 95% CI: 1.4–4.1). On the other hand, cultural beliefs—such as attributing diarrhoea to teething—negatively impacted care-seeking behaviour (AOR = 0.3, 95% CI: 0.2–0.5)[18].

Another descriptive cross-sectional study conducted in Maun, Botswana in 2018 sought to determine factors associated with health-seeking behaviour among caregivers of children under five with diarrhoea[19]. This study included 238 participants recruited through systematic random sampling at child welfare clinics. Data were collected using researcher-administered questionnaires adapted from a similar study conducted in Ethiopia. The findings revealed that only 96 (40.3%) of caregivers demonstrated appropriate health-seeking behaviour, defined as seeking care within 24 hours, using oral rehydration salts (ORS), and visiting qualified healthcare providers[19]. Despite this, 198 (83.2%) sought care outside the home, primarily at

government facilities 188 (79%). The factors influencing care-seeking behaviours included caregiver age and household income[19]. Younger caregivers aged 15–25 years and those from lower-income households were more likely to seek care appropriately. Interestingly, unlike other studies, higher education levels did not significantly improve care-seeking behaviour. Perceived illness severity was a major motivator for seeking treatment, whereas lack of awareness of danger signs led to delays[19]. Traditional healers were rarely consulted in this setting, with only 1 (0.4%) of caregivers reporting their use an uncommon finding compared to other African contexts. A descriptive cross-sectional study was conducted in 2019 to assess the knowledge and health-seeking behaviour of mothers regarding diarrhoea management in children under five. The study took place in Ibadan North Local Government Area, Oyo State, and targeted mothers attending Primary Health Care (PHC) centres[20]. The sample consisted of 215 mothers of under-five children, selected using a multistage sampling technique. Data was collected using a semi-structured interviewer-administered questionnaire. Relevant findings indicated that 184 mothers (85.6%) were aware that diarrhoea could lead to dehydration and even death, gaps existed in knowledge and appropriate care-seeking practices[20]. While 149 (69.3%) sought care from health facilities, a significant proportion still engaged in self-medication or use of traditional remedies. The study emphasized the need for continuous health education on prompt and proper diarrhoea management[20]. In 2023, a cross-sectional quantitative study was conducted in Botswana to identify the factors influencing the decision-making processes of caregivers when managing childhood diarrhoea[21]. The study sampled 372 caregivers using a stratified random sampling technique. Data was collected through structured questionnaires. The analysis revealed that knowledge of diarrhoea danger signs, educational level of caregivers, and accessibility to health facilities significantly affected their care-seeking behaviour[21]. Only 236 (63.4%) of caregivers sought professional healthcare, while others relied on home remedies or pharmacy consultations. Importantly, higher education levels and

awareness of dehydration were positively associated with health facility utilization. This study underscores the need to address both educational and systemic barriers to care-seeking[21].

A community-based analytical cross-sectional study published in 2025 aimed to understand how caregivers manage common childhood illnesses such as diarrhoea, fever, and respiratory infections[22]. The study was conducted in Masindi District, Uganda, and included 1,474 caregivers of children under five, selected through multistage cluster sampling. Data was collected using structured interviews and questionnaires administered by trained fieldworkers[22]. The study revealed that although 1126 (76.4%) of caregivers recognized the need for medical care for diarrhoea, only 767 (52%) sought care at formal health facilities. Socioeconomic status, caregiver education, and perceptions of illness severity influenced this behaviour. The study emphasized the role of community health education and improved healthcare access in improving outcomes[22].

2.3. OPTIONS UTILIZED FOR THE MANAGEMENT OF CHILDHOOD DIARRHOEA BY CAREGIVERS.

A community-based analytical cross-sectional study was conducted in 2017 in Ginchi town, Oromia region, West Ethiopia. The study, which employed a quantitative design, aimed to assess home-based diarrhoea management practices and associated factors among caregivers of under-five children[23]. The population studied consisted of caregivers of children under five years old, with a total sample size of 326 caregivers selected using systematic random sampling[23]. Data was collected through face-to-face interviews using structured questionnaires. Findings showed that 192 (59%) of caregivers had good home-based diarrhoea management practices. Oral Rehydration Solution (ORS) was used by 245 (75%) of caregivers, although only 147 (45.1%) recognized signs of dehydration[23]. Zinc supplementation was underutilized,

with only 69 (21%) of caregivers making use of it. Key predictors of good practice included maternal education, higher income, and being the child's mother[23].

An analytical cross-sectional secondary analysis of the Nepal Demographic and Health Surveys from 2001, 2006, and 2011, examined the relationship between health service utilization and diarrhoea management practices[24]. It involved 2,655 caregivers of children aged 0–59 months who had diarrhoea two weeks prior to the survey[24]. Sampling was done using a multi-stage cluster design, and data were collected via structured household questionnaires. Findings showed that ORS use increased from 850 (32%) in 2001 to 1062 (40%) in 2011, while extra fluid intake declined from 717 (27%) to 398 (15%). 2204 Continued feeding remained high (83–89%), though only 265 (10%) of children received all three recommended treatments which include ORS, extra fluids, and continued feeding. Health service utilization significantly improved care practices[24]. Caregivers who sought professional help were 5.78 times more likely to use ORS, 1.56 times more likely to give extra fluids, and 2.25 times more likely to continue feeding[24]. Socioeconomic factors also played a role—better practices were linked to maternal education, higher income, and urban residence, while rural and less educated caregivers showed lower adherence[24]. A descriptive cross-sectional study conducted between 2016 and 2018 in Munshaat Sultan village, Egypt, employed a quantitative design to evaluate diarrhoea management practices and the influence of socio-demographic factors among caregivers[25]. The study involved 100 caregivers of under-five children selected using systematic random sampling. Structured questionnaires were used for data collection[25]. The study found that only 36 (36%) of caregivers demonstrated good diarrhoea management practices. ORS was used by 43 (43%) of caregivers, while 67 (67%) used antibiotics, often inappropriately. Zinc supplementation remained low at 21 (21%). The quality of diarrhoea management was found to improve with higher maternal education levels and better socioeconomic status[25]. A health facility-based cross-sectional study conducted in 2017 in

Hawassa City, Ethiopia, utilized a quantitative design to assess diarrhoea management practices in health facilities and the factors associated with them. The study population included children aged 3 to 59 months with diarrhoea[26]. A total of 397 children were selected through systematic random sampling, and data was gathered using a structured checklist from health records. The findings indicated that only 172 (43.3%) of children received appropriate diarrhoea management[26]. Zinc supplementation was administered in only 179 (45%) of the cases. Antibiotics were overprescribed in 235 (59.1%) of the cases. The study further revealed that hospitals had higher rates of inappropriate management compared to health centers, with this difference being statistically significant ($p < 0.05$)[26].

In a community-based descriptive cross-sectional survey conducted between 2017 and 2018 in Ikorodu Local Government Area, Lagos State, Nigeria, researchers assessed home management practices of acute diarrhoea among caregivers of under-five children[27]. The study employed a quantitative design and involved about 585 caregiver's selected using consecutive sampling[27]. Data was collected through structured questionnaires. The findings showed that 534 (91.3%) of caregivers were aware of ORS, but only 403 (68.9%) had knowledge of zinc. Only 54 (9.2%) of the respondents correctly used ORS and zinc together[27]. Furthermore, 411 (70.3%) of caregivers administered unnecessary medications, such as antibiotics and antidiarrheal. Only 38 (6.5%) of the respondents provided optimal home management, which includes the correct use of ORS and zinc, increased fluid intake, and continued feeding during episodes of diarrhoea[27].

2.4. FEEDING PRACTICES OF CHILDREN WITH CHILDHOOD DIARRHOEA BY CAREGIVERS

One study conducted in Shanan Dhuggo District, West Hararge Zone, Oromia Region, Ethiopia, in 2019 was a facility-based cross-sectional observational study published in 2021[28]. The aim of the study was to assess feeding practices during diarrhoeal episodes and associated factors among mothers or caregivers of children aged 6–59 months. The study population consisted of mothers or caregivers of children aged 6–59 months with diarrhoea who visited health centers[28]. A total of 422 respondents were selected using systematic random sampling from health centre records. Data were collected using a pretested structured questionnaire administered through face-to-face interviews[28]. The study revealed that only 172 (40.8%) of caregivers practiced appropriate feeding, which included increased fluid intake, breastfeeding, and food frequency. Key predictors of appropriate feeding included children being younger than 24 months, attending postnatal care visits, having only one under-five child, and receiving feeding advice from health workers[28]. Additionally, 151 (36%) of respondents reported increasing breastfeeding frequency, while 127 (30%) increased both food and fluid intake[28]. Another study involved a secondary data analysis based on the Ethiopian Demographic and Health Survey (EDHS) conducted in 2016 and published in 2021[29]. This cross-sectional study assessed feeding practices and associated factors during diarrhoeal episodes among under-five children across Ethiopia[29]. The study population included mothers or caregivers of children under five who had experienced a recent episode of diarrhoea. A sample of 917 respondents was selected using a two-stage stratified sampling technique[29]. Data were gathered through structured household surveys. The study found that only 141 (15.4%) of children received appropriate feeding, defined as more liquids and food than usual[29]. Factors associated with better feeding practices included maternal age between 25 and 34 years, employment in agriculture (which implied better food access), attending four or more antenatal care visits, and

undergoing postnatal check-ups within two months after delivery. It was also found that 123 (13.5%) of caregivers increased fluid intake for the child, while only 56 (6.1%) increased food intake[29].

A third study, conducted in 2021 and published in 2022, assessed diarrhoea prevalence, feeding practices, and associated factors among under-five children in Bereh District, Oromia, Ethiopia[30]. This community-based cross-sectional study involved a sample size of 455 respondents selected through a two-stage random sampling technique involving kebeles and households. Data collection was conducted via structured interviews. The findings revealed that 243 (53.4%) of caregivers exhibited poor feeding practices[30]. Inappropriate practices identified included the early introduction of complementary foods before six months of age, skipping meals during diarrhoeal episodes, and the use of unhygienic feeding methods such as bottle-feeding and feeding with unwashed hands. The study also found that the lack of exclusive breastfeeding significantly increased the risk of diarrhoea, with an adjusted odds ratio of 4.7[30]. A 2019 observational cross-sectional study conducted in Egor Local Government Area, Edo State, Nigeria, explored maternal knowledge and practices regarding the home management of diarrhoea in children under five years of age[31]. The primary aim of the study was to assess maternal understanding and behaviours, with a particular focus on feeding and fluid practices during diarrhoeal episodes. The study population included mothers with at least one child under five who had previously managed a diarrhoeal episode at home[31]. A total of 264 respondents were selected using a multi-stage sampling technique involving the random selection of wards and households. Data collection was carried out using a structured, interviewer-administered questionnaire that gathered socio-demographic data as well as information on knowledge and practical approaches to diarrhoea management, including feeding behaviours[31]. Findings indicated that while the majority of respondents 246 (93.2%) correctly defined diarrhoea as the passage of watery stools three or more times in 24 hours,

actual practices during episodes were suboptimal. Only 121 (45.8%) of mothers reported continuing to feed their children as usual during diarrhoea[31]. A significant number 57 (21.6%) reduced the quantity of food given, while 10 (3.8%) stopped feeding entirely. These patterns reveal a gap between knowledge and adherence to recommended feeding practices[31]. Encouragingly, 172 (65.2%) of mothers reported increasing the child's fluid intake during diarrhoeal episodes, an essential measure for preventing dehydration. However, the practice of combining increased fluids with continued feeding was less widespread than necessary for effective home management[31]. The study concluded that while awareness of diarrhoea was relatively high, targeted health education is still needed to reinforce optimal feeding and hydration practices at home[31].

2.5. FACTORS ASSOCIATED WITH MANAGEMENT OF DIARRHOEAL CONDITIONS BY CAREGIVERS

In a community-based comparative cross-sectional study conducted in 2018 in Doba Woreda, Western Hararghe, the aim was to assess poor home management practices of diarrhoea and associated factors among caregivers of children aged 6 to 59 months[32]. The sample comprised 559 caregivers, with 184 from urban areas and 375 from rural settings, selected using a multistage cluster sampling technique. Data were collected using interviewer-administered structured questionnaires[32]. The study found that only 32 (5.7%) of caregivers withheld food during diarrhoea episodes, while a significant 454 (81.2%) believed that breastfeeding remained important during such periods. Additionally, 111 (19.8%) of rural caregivers reported using rice water and 86 (15.3%) used yogurt as home remedies[32]. Despite the importance of maintaining hydration, 168 (30.1%) of caregivers reduced fluid intake, which runs contrary to WHO recommendations. Two key barriers to appropriate feeding practices were identified: poor caregiver knowledge and challenges associated with preparing oral rehydration salt (ORS) solutions[32].

Another institution-based analytical cross-sectional study conducted in 2016 in Fagita Lekoma District, Awi Zone, Northwest Ethiopia, employed a quantitative cross-sectional design. The study focused on assessing the knowledge and practices of caregivers, as well as the factors associated with home-based diarrhoea management[33]. It involved 370 caregivers attending under-five clinics, selected using systematic random sampling. Structured interviews revealed that 139 (37.6%) of caregivers had good feeding practices during diarrhoeal episodes[33]. A substantial 265 (71.6%) of respondents took their children to health centres, whereas only 19 (5.1%) used homemade fluids[33]. Although 8.4% correctly prepared salt-sugar solutions, a large portion 226 (61.1%) administered ORS only when the child requested it. Moreover, 197 (53.2%) of caregivers stored reconstituted ORS for 12 hours, which increases the risk of microbial contamination[33].

A third community-based comparative cross-sectional study conducted in 2018 in Enemay District, Northwest Ethiopia, investigated diarrhoea prevention practices and the associated factors among caregivers of under-five children[34]. The study had a sample size of 398 caregivers, selected through simple random sampling. Data were obtained through interviewer-administered questionnaires and direct observation[34]. The findings indicated that 201 (50.5%) of caregivers exclusively breastfed their children for the recommended six months. However, only 150 (37.9%) practiced hand washing before feeding, reflecting poor hygiene standards[34]. Additionally, 232 (58.4%) of respondents reported using latrines, though only 62 (27%) maintained them in a clean condition, potentially compromising feeding safety. Notably, housewives were found to have 3.9 times higher odds of exhibiting good diarrhoea prevention practices compared to merchants[34].

A 2021 hospital-based descriptive cross-sectional study conducted in Kiambu County, Kenya, offers insights that are relevant to the context of Ovia North East Local Government Area (LGA), Edo State[35]. The study, carried out at Kiambu Level Five Hospital, aimed to examine

the feeding practices and positions adopted by caregivers when feeding children suffering from diarrhoea, with a particular focus on the factors associated with these practices[35]. The study targeted caregivers of children under five presenting with diarrhoea at the hospital's outpatient department. A total of 160 caregivers were selected using a systematic random sampling technique, ensuring that every second eligible participant was included[35]. Data collection was conducted through structured, interviewer-administered questionnaires, which captured demographic details, feeding practices, caregiver behaviours, and feeding positions during episodes of diarrhoea. Findings from the study revealed that several factors were significantly associated with the management of diarrhoea among caregivers. One of the key determinants was the caregiver's level of education[35]. Those with secondary or higher education were more likely to adhere to recommended practices such as continued feeding and the use of oral rehydration therapy during diarrhoeal episodes. Age also played a role, with caregivers aged between 30 and 39 years showing better feeding and hydration practices[35]. Employment status was another important factor. Employed caregivers demonstrated a greater likelihood of implementing proper diarrhoea management, possibly due to better access to health information and economic resources. Marital status and family size also influenced management behaviours, as married caregivers and those with fewer children appeared to be more attentive to the needs of sick children during episodes of diarrhoea. Importantly, knowledge gained through health education or counselling by healthcare providers significantly improved caregiver practices[35]. Those who had received such education were more likely to continue breastfeeding, offer more fluids, and maintain good feeding practices during their child's illness. The study also highlighted the importance of proper feeding positions, noting that upright positions helped children take in food and fluids more effectively[35].

2.6 CONCEPTUAL FRAMEWORK BASED ON THE HEALTH BELIEFS MODEL

This conceptual framework was developed using the Health Belief Model (HBM)[36], a behavioural theory that explains how individual beliefs and perceptions influence health-related actions. The model suggests that people are more likely to take positive health actions when they believe they are at risk of a disease, understand its seriousness, believe that recommended actions will be beneficial, and perceive fewer barriers to taking those actions.

In this study, the framework explains how caregivers' beliefs and perceptions influence the household management of childhood diarrhoea. If caregivers believe that diarrhoea can lead to dehydration, complications, or death (perceived severity), and that their child is vulnerable to these risks (perceived susceptibility), they are more likely to respond appropriately.

When caregivers believe that practices such as Oral Rehydration Solution (ORS), zinc supplementation, continued feeding, hygiene, and prompt hospital visits are effective (perceived benefits), they are more likely to adopt them. However, barriers such as cost, distance to healthcare facilities, lack of knowledge, or cultural beliefs may prevent proper management.

Cues to action, such as health education, advice from health workers, previous experiences, or worsening symptoms, may motivate caregivers to act. Self-efficacy, which refers to the caregiver's confidence in their ability to manage diarrhoea correctly, also plays an important role.

These beliefs and factors influence household management practices, which ultimately determine outcomes such as recovery, complications, or hospital admission among under-five children with diarrhoea.

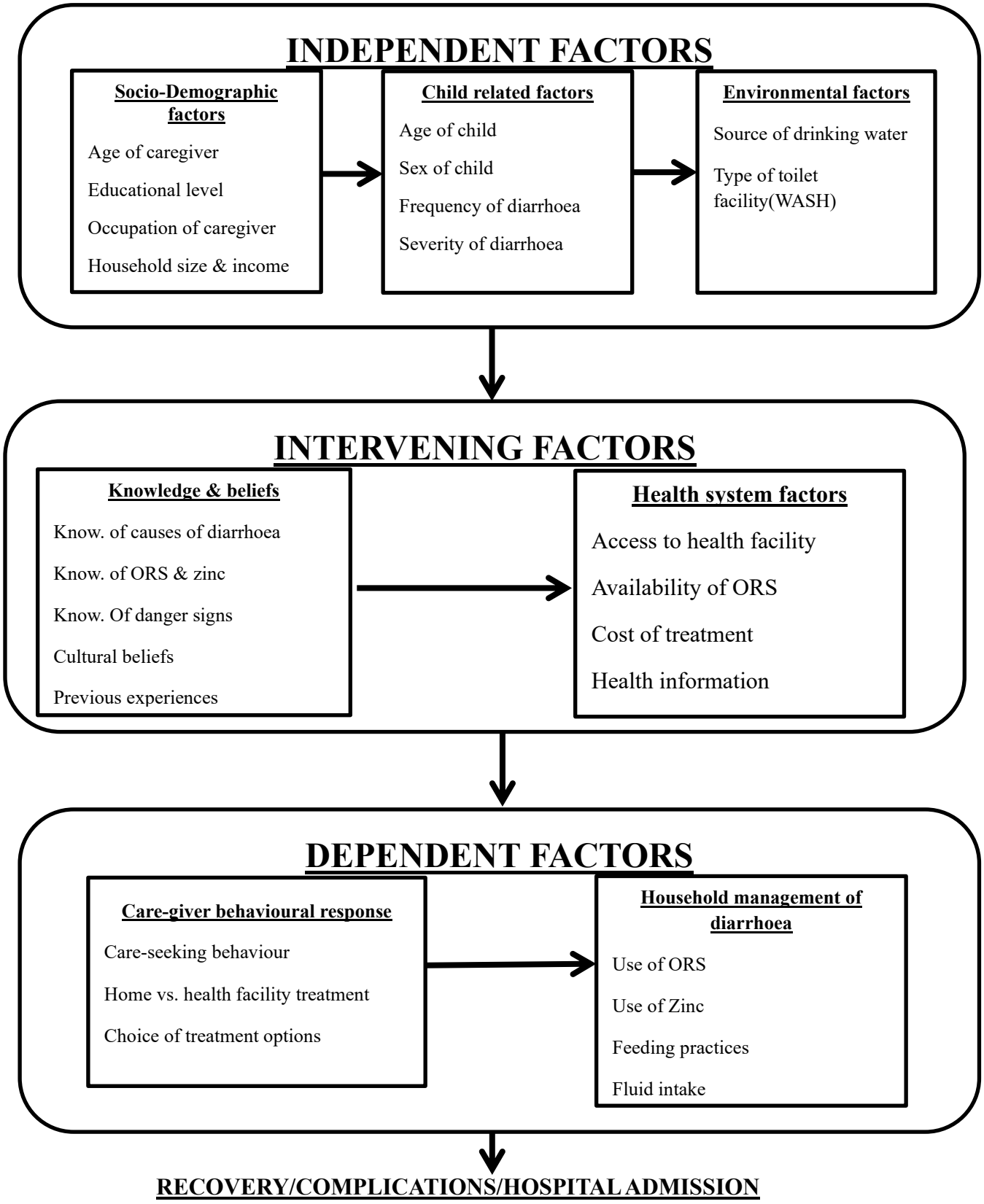

FIG.2.1 CONCEPTUAL FRAMEWORK[36]

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

The study was conducted in Ovia North East Local Government Area (LGA) in Benin City of Edo State, Nigeria. Ovia North East is one of the eighteen LGAs in Edo State, located in the South-South geopolitical zone of Nigeria. Geographically, the LGA is located within the coordinates of longitude 5° 45' E to 6° 15' E and latitude 5° 15' N to 6° 45' N. It is bounded by Ovia South-West to south, Uhumwonde to the east, and the Oredo LGA to the north. A significant geographical feature is the Ovia River, which cuts across the LGA, influencing the climate and providing sources of water. It covers an area of approximately 2,301 square kilometres. According to the estimated Ovia North East 2025 projected population, it has a population of 255,231 people[37]. The area is characterized by a mix of rural and semi-urban communities. It has 13 wards with the headquarters of the LGA in Okada town including major areas like Oluku, Ekiadolor, Oduna, and Ogbese. The Inhabitants are predominantly Benins, with other minority groups and local languages are widely spoken alongside English and pidgin. Farming and petty trading are their major occupations. The LGA has several primary and secondary schools, primary health centres, private clinics, and patent medicine stores that provide health services, especially maternal and child health care. Access to safe water and good road networks remains limited and varies across communities, with some areas relying on boreholes, wells and streams contributing to the risk of water borne diseases such as diarrhoea[38,39].

3.2 STUDY DESIGN

This study used a descriptive cross-sectional design.

3.3 STUDY POPULATION

The study population consisted of caregivers of children under five years of age residing in Ovia North East LGA. Caregivers included mothers, fathers, guardians, and other primary caretakers responsible for the daily care of children. This population group was selected because they are the primary decision-makers and implementers of household care practices for childhood illnesses, including diarrhoea. The estimated number of households with children under five was determined using population projections from the estimated 2025 projected population data specific to the LGA.

3.4 SELECTION CRITERIA

3.4.1 Inclusion Criteria

- Caregivers with children aged 0–59 months.
- Residents of Ovia North East LGA for at least six months prior to the study.
- Caregivers who consented to participate in the study.

3.4.2 Exclusion Criteria

- Caregivers who were temporarily visiting the area.
- Those unable to provide reliable information due to illness or communication barriers.

3.5 STUDY DURATION

- The study was conducted from January 2025 to February 2026.

3.6 SAMPLE SIZE DETERMINATION

The sample size was calculated using Cochran's formula[40] for descriptive studies:

$$\mathbf{n = \frac{Z^2 P(1 - P)}{d^2}}$$

Where:

n = desired sample size

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

P = estimated prevalence of childhood diarrhea (15%)[39]

d = margin of error (0.05)

$$\mathbf{n= \frac{(1.96)^2 \times 0.15(1-0.15)}{0.05^2}}$$

$$\mathbf{n= \frac{3.8416 \times 0.15(0.85)}{0.0025}}$$

$$\mathbf{n= 195.9 \approx 196}$$

To account for potential non-response, a 10% non-response rate was factored in:

Adjusted sample size N = $\frac{n}{1-Non\ response\ rate}$

$N = \frac{196}{1-0.1}$

N = 217.8 ≈ 218

Including a design effect 2 because of multistage sampling method, 218×2= 436

Therefore, a total sample size of **436** caregivers was targeted for inclusion in the study.

3.7 SAMPLING TECHNIQUE

A **multistage sampling method** was used to select respondents systematically and ensure representativeness of caregivers of under-five children in Ovia North East Local Government Area. In the first stage, a list of the 13 wards in Ovia North East LGA will be obtained, and

three wards would be selected. From, the three wards five communities were selected using simple random sampling by balloting. In the second stage, households within each selected community were numbered with the assistance of community leaders and research assistants. Systematic sampling was used to select households with at least one child under five years of age. The sampling interval was determined by dividing the total number of eligible households by the number required from each community. In the third stage, in households with more than one eligible caregiver, one primary caregiver was selected randomly or any that consents to participate in the study. This multistage approach helped to reduce sampling bias and ensured that caregivers from different communities within the local government area were adequately represented.

3.8 DATA MANAGEMENT

3.8.1 Method for Data Collection

Data was collected using a structured, interviewer-administered questionnaire.

3.8.2 Tools for Data Collection

The questionnaire was adapted from standardized UNICEF[41] and WHO[42] tools on childhood diarrhoea management. It was divided into 5 sections which include:

Section A: Socio-demographic characteristics**:** This section contained questions about the **s**ociodemographic characteristics of the caregiver and child, including age, educational level, occupation, household size, and income of caregivers

Section B: Proportion of diarrhoea in under 5 children: This section contained questions assessing the occurrence and characteristics of diarrhoeal episodes among under-five children within the preceding two weeks.

Section C: Care-seeking behaviour of caregivers*:* This section contained questions evaluating caregivers' care-seeking behaviour during diarrhoeal episodes, including timing, source of care, and decision-making patterns.

Section D: Household management practices: This section contained questions assessing home-based management practices during diarrhoea, such as use of Oral Rehydration Salts (ORS), zinc supplementation, feeding practices, fluid intake, and use of traditional remedies.

Section E: Factors influencing management choices: This section contained questions assessing caregivers' knowledge of diarrhoea causes, danger signs of dehydration, prevention practices, and awareness of ORS and zinc.

3.8.3 Method for Data Analysis

The filled questionnaire was checked to see if the data was entered correctly, properly, and for any inconsistencies. The data was entered, coded, cleaned and analysed with IBM SPSS (Statistical Package for Scientific Solutions) version 25.0 software.

Scoring System

Household Size

The household size was categorized into <6 and ≥6 persons. This is based on the average household size of 4.5 persons from the National Demographic and Health Survey[39] conducted 2023 to 2024.

Level of Education

Level 0: No formal education or incomplete primary education

Level 1: Completed primary education or incomplete secondary education

Level 2: Completed secondary education (WAEC, NECO, GCE)

Level 3: Post-secondary/tertiary education (e.g. OND, HND, BSC, BA, MBBS)

No formal education and primary level of education was given a score of 1

Secondary level of education was given a score of 2

Tertiary level of education was given a score of 3

Occupation

Occupation of the respondents and their partners was characterized into skill level 0-4 using the International Labour Organization classification[43].

Skill level 0: Unemployed, student, retiree, housewives.

Skill level 1: Labourers, cleaners, gardeners, kitchen assistants

Skill level 2: Traders, receptionists, civil servants, bus drivers, farmers, butchers, police officers

Skill level 3: Medical laboratory technicians, legal secretaries, commercial representatives

Skill level 4: Doctors, lawyers, engineers, teachers, nurses, accountants

Skill level 0 and 1 were given a score of 1

Skill level 2 and 3 were given a score of 2

Skill level 4 was given a score of 3

Socioeconomic Status

This was scored using a composite scoring[44] and the scoring combined level of education and skill level and was categorized into high, middle and low socioeconomic status. A total score of 6 was given for socioeconomic status

Upper socioeconomic status: 5-6

Middle socioeconomic status: 3-4

Low socioeconomic status: 1-2

Scoring of Home Treatment Options Utilized

The home treatment options utilized for the management of diarrhoea was assessed using 14 questions. Each correct response was given a score of 1 and each incorrect response was given a score of 0[32]. The total score for each respondent was converted into percentages and graded as;

Appropriate home treatment options: ≥50%

Inappropriate home treatment options: <50%

Scoring of Feeding Practices During Diarrhoea

The feeding practices during diarrhoea was assessed using 3 questions. Responses were categorized as more, same, less, or stopped[32]. Respondents chose a preferred option from the 4 options and it was graded as follows;

More - 4

Same - 3

Less - 2

Stopped - 1

The cumulative scores for each respondent was converted into percentages and graded as;

Good feeding practices: ≥50%

Poor feeding practices: <50%

Scoring of Care-seeking behaviour

The care-seeking for the management of diarrhoea was assessed using 10 questions. Each correct response was given a score of 1 and each incorrect response was given a score of 0[45]. The total score for each respondent was converted into percentages and graded as;

Appropriate care seeking: ≥50%

Inappropriate care seeking: <50%

3.9 TRAINING OF RESEARCH ASSISTANTS

Two research assistants (undergraduates in the University of Benin studying Medicine) were recruited for the purpose of this study with proper training on questionnaire administration. Adequate supervision was also provided during the exercise to ensure uniform data collection

3.10 ETHICAL CONSIDERATION

Ethical clearance was obtained from the University of Benin Teaching Hospital Ethical Committee with protocol number ADM/E 22/A/ VOL.VII/ 14865491272109 and consent was also obtained from the Ovia LGA community leaders. Verbal consent was also obtained from the respondents after they have been educated on the purpose of the study and confidentiality of the information provided assured before administering the questionnaires. Names and addresses were omitted to ensure confidentiality. The respondents were informed that they have the right to withdraw from the interview at any time and that withdrawal posed no loss or harm.

3.11 LIMITATIONS OF THE STUDY

This study relied on information provided by caregivers, which may have been affected by recall bias, as some respondents may not have accurately remembered previous diarrhoeal episodes or the measures taken during management. There was a possibility of social desirability bias, as some respondents may have provided answers they considered acceptable rather than their actual practices, especially on issues related to hygiene, feeding practices, and treatment methods. Since the research is restricted to Ovia North East LGA, the findings may not represent other areas. Time and resource constraints could reduce the sample size or depth of data collected, and some caregivers may decline participation or provide incomplete responses. Despite these limitations, appropriate measures were taken during data collection and analysis to ensure that the findings remain useful and reliable.

3.12 PRETESTING

The questionnaire was pre-tested in a Uselu area of Egor LGA using 10% of the final sample size (44). This was done to ensure standardization and relevance of the questionnaire.

CHAPTER FOUR

RESULTS

A total of 436 respondents participated in the study with 100% response rate. The results are presented in the following sections in line with the specific objectives.

SECTION A: Socio-demographic characteristics of respondents

SECTION B: The proportion of U5 children with diarrhoea

SECTION C: Care-seeking behaviour of the management of diarrhoea of U5 children by caregivers.

SECTION D: Determine the options utilized and feeding practices of children with childhood diarrhoea

SECTION E: Identify the factors associated with management of diarrhoea disease by caregivers.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (n = 436)	Percent
Sex of caregiver		
Male	65	14.9
Female	371	85.1
Age group(years)		
≤24	16	3.7
25-29	48	11.0
30-34	110	25.2
35-39	86	19.7
40-44	66	15.2
45-49	41	9.4
≥50	69	15.8
Mean±SD	39.2±10.6	
Ethnic group		
Benin	257	58.9
Esan	89	20.4
Urhobo	32	7.3
Afemai	20	4.6
Igbo	10	2.3
Yoruba	9	2.1
Ijaw	8	1.8
Ika	7	1.7
Hausa	4	0.9
Marital status		
Single	26	6.0
Married	317	72.7
Co-habiting	35	8.0
Divorced/Separated	26	6.0
Widowed	32	7.3
Religion		
Christianity	335	76.8
Islam	72	16.5
African Traditional Religion (ATR)	29	6.7

The majority of caregivers were female 371 (85.1%), while males accounted for 65 (14.9%). Regarding age distribution, the largest group comprised caregivers aged 30–34 years 110 (25.2%), followed by those aged 35–39 years 86 (19.7%), >50 years 69 (15.8%), 40–44 years 66 (15.2%), 25-29 years 48 (11.0%), 45-49 years 41 (9.4%), and ≤24 years 16 (3.7%). In terms of ethnicity, Benin constituted the largest group 257 (58.9%), followed by Esan 89 (20.4%), Urhobo 32 (7.3%), Afemai 20 (4.6%), and other ethnic groups accounting for smaller proportions.

Regarding marital status, the majority were married 317 (72.7%), while 35 (8.0%) were cohabiting, 32 (7.3%) were widowed, 26 (6.0%) were divorced/separated, and 26 (6.0%) were single. Christianity was the commonest religion (335; 76.8%), followed by Islam (72; 16.5%) and African Traditional Religion (29; 6.7%).

Table 2: Family characteristics of respondents

Variables	Frequency (n = 436)	Percent
Marriage type(n=317)		
Monogamous	210	66.2
Polygamous	107	33.8
Family type		
Nuclear	159	36.5
Extended	277	63.5
Household size		
<6	178	40.8
≥6	258	59.2
Who supports family financially		
Both parents	92	21.1
Father	247	56.6
Mother	78	17.9
Relatives*	19	4.4

***Aunties, uncles**

Among the 317 married respondents, 210 (66.2%) were in monogamous unions and 107 (33.8%) were in polygamous unions. Extended families predominated (277; 63.5%), and as presented in the table, 178 (40.8%) respondents had fewer than six persons living together, while 258 (59.2%) had more than six persons. The family was supported financially by fathers alone mostly in 247 (56.6%), both parents in 92(21.1), mothers alone in 78 (17.9%), and relatives in 19 (4.4%).

Table 3: Socio-economic characteristics of respondents

Variables	Frequency (n = 436)	Percent
Level of education		
No formal education	43	9.9
Primary	110	25.2
Secondary	166	38.1
Tertiary	117	26.8
Caregiver occupation skill level		
0	74	17.0
1	60	13.8
2	258	59.2
3	2	0.4
4	42	9.6
Spouse occupation skill level(n=352)		
0	3	0.9
1	72	20.5
2	229	65.1
3	14	4.0
4	34	9.7
Monthly income category(₦)		
<70,000	73	16.7
70,000–149,000	198	45.4
≥150,000	165	37.8
SES		
Upper	172	39.4
Middle	260	59.6
Low	4	0.9

The majority of caregivers had formal education: secondary education 166 (38.1%), tertiary education 117 (26.8%), and primary education 110 (25.2%), while 43 (9.9%) had no formal education.

Caregiver occupation was mainly skill level 2 (258; 59.2%), while spouse occupation was also mainly skill level 2 (229; 65.1%). Monthly income was highest in the ≥150,000-naira category (165; 37.8%), followed by 70,000-149,000 naira (198; 45.5%) and <70,000 naira (73; 16.7%). Regarding socioeconomic status most respondent ranked in the middle class (260; 59.6%) followed by upper class (172:39.4%) and finally low (4; 0.9%).

Table 4: Characteristics of index child

Variables	Frequency (n = 436)	Percent
Sex of selected child		
Male	212	48.6
Female	224	51.4
Child age (months)		
<12	90	20.6
12-23	131	30.0
24–59	215	49.3
Mean±SD	25.3.±14.4	
Relationship to the child		
Mother	324	74.3
Father	43	9.9
Grandmother	36	8.2
Aunty	23	5.3
Others*	10	2.3
No of children		
<3	109	25.0
≥3	327	75.0
Mean ±SD	3.58 ±1.56	

***Siblings, uncles**

Slightly more selected children were female (224; 51.4%) than male (212; 48.6%). Nearly half of the children were aged 24-59 months (215; 49.3%), while 131 (30.0%) were aged 12-23 months and 90 (20.6%) were younger than 12 months.

More than half of the households had two or more under-five children (248; 56.9%). Most respondents were mothers of the selected child (324; 74.3%), followed by fathers (43; 9.9%), grandmothers (36; 8.2%), aunties (23; 5.3%) and others (2.3%).

SECTION B: PROPORTION OF CHILDREN WITH DIARRHOEA DISEASE

Table 5: Diarrhoeal disease pattern of U5s

Variables	Frequency	Percent
Definition of diarrhoea (n = 436)		
Three or more loose/watery stools in 24 hours	232	53.2
One watery stool in a day	99	22.7
Formed stools more than three times daily	68	15.6
Any stool after meals	37	8.5
Child had diarrhoea in last 2 weeks (n = 436)	212	48.6
Stool frequency in last 24hrs of episode (n = 212)		
Once	40	18.9
Twice	71	33.5
Three times or more	101	47.6
Blood in stool during episode (n = 212)	56	26.4
Identify danger signs of dehydration (n = 436)	228	52.3
Signs* (n = 228)		
Very thirsty	123	53.9
Lethargy	89	39.0
Dry mouth	137	60.1
Crying always	63	27.6
Number of diarrhoeal episodes (past 6 months) (n = 436)		
None	73	16.7
One	116	26.6
Two	143	32.8
Three or more	104	23.9

***Multiple response question**

More than half of the caregivers correctly defined diarrhoea as the passage of three or more loose or watery stools in 24 hours (232; 53.2%). However, 99 (22.7%) defined it as one watery stool in a day, 68 (15.6%) as formed stools more than three times daily, and 37 (8.5%) as any

stool after meals. Almost half of the under-five children had diarrhoea in the two weeks preceding the survey (212; 48.6%). Among children who had diarrhoea, 101 (47.6%) passed stool three times or more within the last 24 hours of the episode, 71 (33.5%) passed stool twice, and 40 (18.9%) passed stool once. Blood in stool was reported in 55 (26.3%) of the diarrhoeal episodes. A majority of caregivers identified danger signs of dehydration (155; 67.7%). The danger signs most commonly mentioned were dry mouth (137; 59.8%) and being very thirsty (123; 53.7%), while lethargy (89; 38.9%) and persistent crying (63; 27.5%) were mentioned less often. In the six months preceding the study, the commonest history was two diarrhoeal episodes (143; 32.8%), followed by one episode (116; 26.6%), three or more episodes (104; 23.9%), while 73 (16.7%) reported no episode.

Table 6a: Factors associated with diarrhoeal disease among U5 children

Variables	Proportion of diarrhoea		Test statistic	p-value
	Yes (n=212) Freq(%)	No (n=224) Freq(%)	($\chi 2$)	
Sex of caregiver				
Male	35 (53.8)	30 (46.2)	0.834	0.361
Female	177 (47.7)	194 (52.3)		.
Age group(years)				
<40	132 (50.8)	128 (49.2)	3.238	0.198
40-49	44 (41.1)	63 (58.9)		
≥50	36 (52.2)	33 (47.8)		
Ethnicity				
Non-Edo indigene	21 (67.7)	10 (32.3)	4.883	**0.027**
Edo indigene	191 (47.2)	214 (52.8)		
Education				
Non-formal	19 (44.2)	24 (55.8)	0.376	0.540
Formal	193 (49.1)	200 (50.9)		
Marital status				
Never married	11 (42.3)	15 (57.7)	0.442	0.506
Ever married	201 (49.0)	209 (51.0)		
Marriage type				
Monogamous	99 (47.1)	111 (52.9)	0.162	0.687
Polygamous	53 (49.5)	54 (50.5)		
Family type				
Nuclear	73 (45.9)	86 (54.1)	0.737	0.391
Extended	139 (50.2)	138 (49.8)		
Monthly income (₦)				
<70,000	37 (50.7)	36 (49.3)	2.681	0.262
70,000–149,000	103 (52.0)	95 (48.0)		
≥150,000	72 (43.6)	93 (56.4)		
SES				
Upper	83 (48.3)			
Middle	126 (48.5)	134 (51.5)	1.126	0.569
Low	3 (75.0)	1 (25.0)		
Household size				
<6	87 (48.9)	91 (51.1)	0.008	0.930
≥6	125 (48.4)	133 (51.6)		

The proportion of U5 children diarrhoea was slightly higher among those female caregivers 177 (47.7%) compared to male caregivers 35 (53.8%), but this difference was not statistically significant ($\chi^2 = 0.834$, p =0.361). Across age groups, the highest proportion of diarrhoea was observed among caregivers aged <40 years 132 (50.8%), followed by 40–49 years 44 (41.1%), and >50 years 36 (52.2%). However, this association was not statistically significant ($\chi^2 = 3.238$, p = 0.198). Regarding ethnicity, non-Edo indigenes had a significantly higher proportion of diarrhoea 21 (67.7%) compared to Edo indigenes 191 (47.2%), and this difference was statistically significant ($\chi^2 = 4.883$, p = 0.027). The proportion of diarrhoea was comparable between caregivers with formal education 193 (49.1%) and those with non-formal education 19 (44.2%), with no statistically significant difference ($\chi^2 = 0.376$, p = 0.540). Marital status showed no significant association, with ever-married caregivers reporting 201 (49.0%) diarrhoea cases compared to 11 (42.3%) among never-married caregivers ($\chi^2 = 0.442$, p = 0.506). Similarly, marriage type showed no significant difference, with polygamous families at 69 (50.4%) and monogamous families at 131 (48.3%) ($\chi^2 = 0.149$, p = 0.699). Family type showed no significant association, with extended families reporting 139 (50.2%) diarrhoea cases compared to 73 (45.9%) in nuclear families ($\chi^2 = 0.737$, p = 0.391). Monthly income showed no statistically significant association with diarrhoea proportion ($\chi^2 = 2.714$, p = 0.257), with the highest proportion among those earning 70,000–149,000 naira 103 (52.0%), followed by those earning less than 70,000 naira 37 (50.7%), and those earning ≥150,000 naira 72 (43.6%). Household size showed no significant association, with those having fewer than six persons reporting 87 (48.9%) and those with six or more reporting 125 (48.4%) ($\chi^2 = 0.008$, p = 0.930). SES showed no significant association with diarrhoea disease among U5s with the highest proportion among the low 3 (75%), followed by the middle 126 (48.5%), and the upper 83 (48.3%).

Table 6b: Factors associated with diarrhoeal disease among children among U5 children

Variables	Proportion of diarrhoea		Test statistic	p-value
	Yes (n=212) Freq(%)	No (n=224) Freq(%)	($\chi 2$)	
Number of children				
<3	48 (44.0)	61 (56.0)	1.224	0.269
≥3	164 (50.2)	163 (49.8)		
Child age				
0–23 months	91 (41.2)	130 (58.8)	9.950	**0.002**
24–59 months	121 (56.3)	94 (43.7)		
Religion				
Christianity	156 (46.6)	179 (53.4)	5.425	0.066
Islam	36 (50.0)	36 (50.0)		
ATR	20 (69.0)	9 (31.0)		
Caregiver skill level				
Skill level 2	128 (49.6)	130 (50.4)	0.128	0.721
Others*	84 (47.2)	94 (52.8)		
Spouse skill level				
Skill level 2	109 (47.6)	120 (52.4)	0.212	0.995
Others*	61 (49.6)	62 (50.4)		
Sex of child				
Male	110 (51.9)	102 (48.1)	1.759	0.185
Female	102 (45.5)	122 (54.5)		
No. of U5				
<2	87 (46.3)	101 (53.7)	0.729	0.393
≥2	125 (50.4)	123 (49.6)		
Relationship to child				
Mother	159 (49.1)	165 (50.9)	2.336	0.674
Father	21 (48.8)	22 (51.2)		
Aunty	8 (34.8)	15 (65.2)		
Grandmother	18 (50.0)	18 (50.0)		
Others**	6 (60.0)	4 (40.0)		
Financial Support				
Father	125 (50.6)	122 (49.4)	0.897	0.344
Others***	87 (46.0)	102 (54.0)		

***Skill 0,1,3,4,**uncles ***both parents, mother, relatives**

Child age showed a statistically significant association with diarrhoea proportion ($\chi^2 = 9.950$, $p = 0.002$). Children aged 24–59 months had a higher proportion of diarrhoea 121 (56.3%) compared to those aged 0–23 months 91 (41.2%). Religion showed no statistically significant association ($\chi^2 = 5.425$, $p = 0.066$), although African Traditional Religion followers had the highest proportion 20 (69.0%), followed by Islam 36 (50.0%) and Christianity 156 (46.6%). Neither caregiver occupation ($\chi^2 = 3.332$, $p = 0.504$) nor spouse occupation ($\chi^2 = 0.212$, $p = 0.995$) showed statistically significant associations with diarrhoea proportion. Sex of the child showed no significant difference, with males at 110 (51.9%) and females at 102 (45.5%) ($\chi^2 = 1.759$, $p = 0.185$). The number of under-five children showed no significant association ($\chi^2 = 0.729$, $p = 0.393$), with those having two or more at 125 (50.4%) and those with fewer than two at 87 (46.3%). Relationship to the child ($\chi^2 = 2.336$, $p = 0.674$) and financial support ($\chi^2 = 0.897$, $p = 0.344$) also showed no statistically significant associations with diarrhoea proportion.

Table 7a: Predictors of diarrhoeal disease among U5 children

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age of caregiver (years)	-0.007	0.993	0.969	1.018	0.565
Sex of caregiver					
Male*		1			
Female	-0.185	0.831	0.417	1.655	0.598
Ethnicity					
Non Edo indigenes*		1			
Edo indigenes	-0.888	0.412	0.166	1.020	0.055
Education					
Non-Formal*		1			
Formal	0.150	1.162	0.495	2.726	0.730
Marriage type					
Monogamous*		1			
Polygamous	0.119	1.126	0.691	1.836	0.634
Family type					
Nuclear*		1			
Extended	-0.070	0.933	0.561	1.551	0.788
Caregiver skill level					
Skill level 2 *		1			
others	0.084	1.088	0.684	1.729	0.723
SES					
Upper class*		1			
Middle class	−0.042	0.959	0.609	1.508	0.855
Lower class	1.820	6.172	0.526	72.466	0.148
Spouse skill level					
Skill level 2*		1			
Others	0.114	1.121	0.691	1.819	0.644

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

Table 7b: Predictors of diarrhoeal disease among U5 children

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Religion					
Christianity*		1			
Other	-0.251	0.778	0.451	1.342	0.367
Household size					
<6*		1			
≥ 6	0.170	1.185	0.727	1.932	0.495
No. of children					
<3*		1			
≥ 3	0.075	1.078	0.619	1.876	0.791
Income (₦)					
≥150000*		1			
Others	0.123	1.131	0.690	1.853	0.626
Support					
Father*		1			
Others	-0.285	0.752	0.465	1.215	0.244
No. of U5					
<2*		1			
≥2	0.092	1.096	0.674	1.782	0.711
Child age					
0-23 months*		1			
24-59 months	0.288	1.334	0.767	2.318	0.308
Sex of selected child					
Male*		1			
Female	-0.191	0.826	0.520	1.313	0.420
Relationship with U5					
Mother *		1			
Others	0.019	1.019	0.579	1.793	0.949

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

Age of caregiver was not significantly associated with diarrhoeal disease (AOR = 0.993, 95% CI: 0.969–1.018, p = 0.565), indicating that caregiver age did not influence the odds of diarrhoeal disease among under-five children. Sex of caregiver was also not significant, with female caregivers showing slightly lower odds compared to males (AOR = 0.831, 95% CI: 0.417–1.655, p = 0.598). Ethnicity showed a borderline association, where Edo indigenes had lower odds of diarrhoeal disease compared to non-Edo indigenes (AOR = 0.412, 95% CI: 0.166–1.020, p = 0.055), though this was not statistically significant at the 5% level. Educational status was not significantly associated with diarrhoeal disease (AOR = 1.162, 95% CI: 0.495–2.726, p = 0.730), indicating that formal education did not significantly affect disease occurrence.

Marriage type, family type, caregiver occupation, spouse skill level, religion, household size, number of children, income level, and social support were all not significantly associated with diarrhoeal disease, as their p-values were greater than 0.05. Socioeconomic status showed that children from lower-class households had higher odds of diarrhoeal disease (AOR = 6.172), although this was not statistically significant (95% CI: 0.526–72.466, p = 0.148), suggesting a possible but inconclusive increased risk.

Child-related factors such as age of child, sex of selected child, number of under-five children in the household, and relationship with caregiver were also not significantly associated with diarrhoeal disease.

SECTION C: CARE SEEKING BEHAVIOUR TOWARDS THE MANAGEMENT OF DIARRHOEA IN U5

Table 8a: Care seeking behaviour of caregivers towards management of diarrhoea in U5

Variable	Frequency (n=436)	Percent
Sought advice or treatment outside home	205	47.0
First place of care sought		
Government hospital	53	25.9
Health centre	45	22.0
Private clinic	42	20.5
Pharmacy	32	15.6
Community health worker	14	6.8
Traditional healer	7	3.4
Relative/Friend	6	2.9
Church	3	1.5
Others*	3	1.5
Reason for choosing care site		
Trust in care provider	52	25.4
Close distance	46	22.4
Cheap	36	17.6
Quick service	25	12.2
Availability of drugs	23	11.2
Previous good experience	18	8.8
Others**	5	2.4
Who decided to seek care* **		
Mother	129	62.9
Father	59	28.8
Both parents	71	34.6
Grandparent	9	4.4
Others****	35	17.1
What was used for treatment* **		
ORS given	123	60.0
Zinc	47	22.9
Antibiotics	80	39.0
Herbal medicine	48	23.4
IV fluids	22	10.7
Other treatment*****	18	8.8

*Mosque**recommendation ***multiple response question **** colleagues, friends, *****bioflor, coconut water

Less than half of the respondents sought advice or treatment outside the home 205 (47.0%). Regarding the first place of care sought, government hospitals were the most common 53 (25.9%), followed by health centres 45 (22.0%), private clinics 42 (20.5%), pharmacies 32 (15.6%), community health workers 14 (6.8%), traditional healers 7 (3.4%), relatives/friends 6 (2.9%), churches 3 (1.5%), and others 3 (1.5%). The main reasons for choosing a care site were: trust in care provider 52 (25.4%), close distance 46 (22.4%), cheap cost 36 (17.6%), quick service 25 (12.2%), availability of drugs 23 (11.2%), previous good experience 18 (8.8%), and others 5 (2.4%). Regarding who decided to seek care, mothers made the decision in the majority of cases 129 (62.9%), both parents decided in 71 (34.6%), fathers in 59 (28.8%), grandparents in 9 (4.4%), and others in 35 (17.1%). For treatments used, ORS was given in 123 (60.0%) of cases, antibiotics in 80 (39.0%), herbal medicine in 48 (23.4%), zinc in 47 (22.9%), IV fluids in 22 (10.7%), and other treatments in 18 (8.8%).

Table 8b: Care seeking behaviour of caregivers towards management of diarrhoea in U5

Variable	Frequency (n=436)	Percent
Satisfied with treatment received	151	73.7
Travel time to nearest PHC		
Less than 15 minutes	52	12.0
15–30 minutes	173	40.0
30–60 minutes	140	32.4
More than 60 minutes	67	15.5
Hospitalisation payment		
Caregiver	182	63.6
Spouse/Partner	92	32.2
Government	26	9.1
Extended family	44	15.4
Other*	19	6.6
Reason for not seeking immediate care (n= 135)		
Used home remedy first	40	29.6
Thought it would stop on its own	32	23.7
Lack of money	25	18.5
Long distance to health facility	19	14.1
Lack of transport	18	13.3
Cultural/family beliefs	1	0.7
Time before seeking care		
Same day	70	34.1
After 1 day	77	37.6
After 2 days	30	14.6
3 days or more	28	13.7

*Church, friends

The majority of caregivers were satisfied with the treatment received 151 (73.7%). Regarding travel time to the nearest primary health centre, the distribution was: 15–30 minutes 173 (40.0%), 30–60 minutes 140 (32.4%), more than 60 minutes 67 (15.5%), and less than 15

minutes 52 (12.0%). For hospitalisation payment, caregivers themselves paid in most cases 182 (63.6%), followed by spouse/partner 92 (32.2%), extended family 44 (15.4%), government 26 (9.1%), and others 19 (6.6%). The main reasons for not seeking immediate care were: used home remedy first 40 (29.6%), thought it would stop on its own 32 (23.7%), lack of money 25 (18.5%), long distance to health facility 19 (14.1%), lack of transport 18 (13.3%), and cultural/family beliefs 1 (0.7%). The main reasons for choosing a care site were: trust in care provider 52 (25.4%), close distance 46 (22.4%), cheap cost 36 (17.6%), quick service 25 (12.2%).Regarding time before seeking care, after 1 day was most common 77 (37.6%), followed by same day 70 (34.1%), after 2 days 30 (14.6%), and 3 days or more 28 (13.7%).

Table 9a: Factors associated with treatment satisfaction among caregivers of U5

Variables	Treatment satisfaction		Test statistic	p-value
	Yes (n=151) Freq(%)	No (n=54) Freq(%)		
Sex of caregiver			0.556	0.456
Male	23 (79.3)	6 (20.7)		
Female	128 (72.7)	48 (27.3)		
Age group (years)			0.266	0.876
< 40	94 (74.6)	32 (25.4)		
40–49	36 (73.5)	13 (26.5)		
≥ 50	21 (70.0)	9 (30.0)		
Ethnicity			1.601*	0.261
Non-Edo	11 (61.1)	7 (38.9)		
Edo	140 (74.9)	47 (25.1)		
Education			0.766*	0.395
Non-formal	11 (64.7)	6 (35.3)		
Formal	140 (74.5)	48 (25.5)		
Marital status			1.846	0.174
Never married	15 (78.9)	4 (21.1)		
Ever married	136 (73.1)	50 (26.9)		
Marriage type			2.094	0.148
Monogamous	71 (72.4)	27 (27.6)		
Polygamous	40 (83.3)	8 (16.7)		
Family type			14.685	**<0.001**
Nuclear	73 (88.0)	10 (12.0)		
Extended	78 (63.9)	44 (36.1)		
Monthly income (₦)			7.430	**0.024**
<70,000	20 (69.0)	9 (31.0)		
70,000–149,000	57 (65.5)	30 (34.5)		
≥150,000	74 (83.1)	15 (16.9)		
SES			1.309*	0.520
Upper class	58 (77.3)	17 (22.7)		
Middle class	92 (71.9)	36 (28.1)		
Lower class	1 (50.0)	1 (50.0)		
Household size			6.867	**0.009**
<6	73 (83.0)	15 (17.0)		
≥6	78 (66.7)	39 (33.3)		
Number of children			3.697	0.055
<3	52 (82.5)	11 (17.5)		
≥3	99 (69.7)	43 (30.3)		

Sex of caregiver was not significantly associated with treatment satisfaction (0.556, p = 0.456). Male caregivers had a higher proportion of good satisfaction 23 (79.3%) compared to females 128 (72.7%). Age group was not significantly associated with treatment satisfaction (0.266, p = 0.876). Caregivers aged <40 years had 94 (74.6%) good satisfaction, those aged 40–49 years had 36 (73.5%), while those aged ≥50 years had 21 (70.0%). Ethnicity showed no statistically significant association (1.601, p = 0.261). Edo respondents had a higher proportion of good satisfaction 140 (74.9%) compared to non-Edo respondents 11 (61.1%).

Education was not significantly associated with treatment satisfaction (0.766, p = 0.395). Respondents with formal education had 140 (74.5%) good satisfaction compared to 11 (64.7%) among those with non-formal education. Marital status was also not significantly associated (1.846, p = 0.174). Never married caregivers had 15 (78.9%) good satisfaction compared to 136 (73.1%) among ever married caregivers. Marriage type was not significantly associated with treatment satisfaction (2.094, p = 0.148). Caregivers in polygamous marriages had a higher proportion of good satisfaction 40 (83.3%) compared to those in monogamous marriages 71 (72.4%).

Family type was significantly associated with treatment satisfaction (14.685, p < 0.001). Caregivers from nuclear families had a much higher proportion of good satisfaction 73 (88.0%) compared to those from extended families 78 (63.9%). Monthly income was significantly associated with treatment satisfaction (7.430, p = 0.024). Respondents earning ≥150,000 had the highest proportion of good satisfaction 74 (83.1%), compared to those earning <70,000 with 20 (69.0%) and 70,000–149,000 with 57 (65.5%). Socioeconomic status was not significantly associated with treatment satisfaction (1.309, p = 0.520). Upper class respondents had 58 (77.3%) good satisfaction compared to 92 (71.9%) among the middle class and 1 (50.0%) in the lower class.

Household size was significantly associated with treatment satisfaction (6.867, p = 0.009). Households with fewer than 6 members had a higher proportion of good satisfaction 73 (83.0%) compared to those with 6 or more members 78 (66.7%). Number of children was not significantly associated with treatment satisfaction (3.697, p = 0.055), although households with fewer than 3 children had a higher proportion of good satisfaction 52 (82.5%) compared to those with 3 or more children 99 (69.7%).

Table 9b: Factors associated with treatment satisfaction among caregivers of U5

Variables	Treatment satisfaction		Test statistic	p-value
	Yes (n=151) Freq(%)	No (n=54) Freq(%)		
Child age group				
0–23 months	30 (71.4)	12 (28.6)	1.135	0.713
24–59 months	121 (74.2)	42 (25.8)		
Religion				
Christianity	118 (77.1)	35 (51.0)	3.864	0.145
Islam	24 (64.9)	13 (35.1)		
African Traditional Religion	9 (60.0)	6 (40.0)		
Caregiver skill level			0.957	0.328
Others	53 (69.7)	23 (30.3)		
Skill level 2	98 (76.0)	31 (24.0)		
Spouse skill level			4.844	**0.028**
Others	48 (85.7)	8 (14.3)		
Skill level 2	75 (70.1)	32 (29.9)		
Sex of child			1.897	0.168
Male	78 (78.0)	22 (22.0)		
Female	73 (69.5)	32 (30.5)		
No. of U5 children			0.552	0.458
≥2	76 (76.0)	24 (24.0)		
<2	75 (71.4)	30 (28.6)		
Relationship to child				
Mother	107 (48.1)	168 (51.9)	2.466	0.651
Father	16 (80.0)	4 (20.4)		
Aunty	13 (86.7)	2 (13.3)		
Grandmother	10 (71.4)	4 (28.6)		
Others*	5 (60.0)	4 (40.0)		
Support			0.069	0.793
Other	87 (74.4)	30 (25.6)		
Father	66 (72.7)	24 (27.3)		

***Siblings, uncle**

Child age group was not significantly associated with treatment satisfaction. Respondents with children aged 24–59 months had slightly higher satisfaction 121 (74.2%) compared to those aged 0–23 months 30 (71.4%), while dissatisfaction was 42 (25.8%) and 12 (28.6%) respectively. Religion was also not significantly associated with treatment satisfaction. Christians reported 118 (77.1%) satisfaction and 35 (51.0%) dissatisfaction, Muslims 24 (64.9%) satisfied and 13 (35.1%) dissatisfied, while respondents practicing African Traditional Religion had 9 (60.0%) satisfied and 6 (40.0%) dissatisfied. Caregiver occupation skill level showed no significant association with treatment satisfaction.

However, spouse occupation skill level was significantly associated with treatment satisfaction ($\chi^2 = 4.844$, $p = 0.028$). Respondents whose spouses were in "other" skill categories had higher satisfaction 48 (85.7%) compared to those in skill level 2 75 (70.1%), while dissatisfaction was 8 (14.3%) and 32 (29.9%) respectively. Sex of child was not significantly associated with treatment satisfaction. Male children had 78 (78.0%) satisfaction and 22 (22.0%) dissatisfaction, while female children had 73 (69.5%) satisfied and 32 (30.5%) dissatisfied. Number of under-five children was also not significant. Households with ≥2 children had 76 (76.0%) satisfaction and 24 (24.0%) dissatisfaction, while those with <2 had 75 (71.4%) satisfied and 30 (28.6%) dissatisfied.

Relationship to the child showed no significant association with treatment satisfaction. Mothers accounted for 107 (48.1%) satisfied responses, fathers 16 (80.0%), aunties 13 (86.7%), grandmothers 10 (71.4%), and others 5 (60.0%), with generally similar distributions across groups. Support source was also not significantly associated with treatment satisfaction. Respondents supported by "others" had 87 (74.4%) satisfaction and 30 (25.6%) dissatisfaction, while those supported by fathers had 64 (72.7%) satisfaction and 24 (27.3%) dissatisfaction.

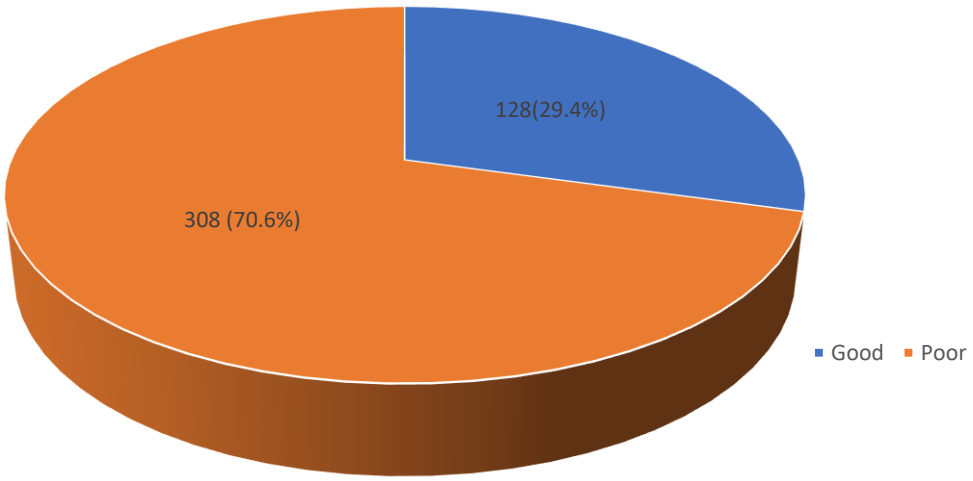

Fig.1: Care seeking behaviour

Figure 1 shows that 128 (29.4%) caregivers had good care-seeking behaviour, whereas 308 (70.6%) had poor care-seeking behaviour. This indicates that poor care-seeking behaviour was predominant among the caregivers

Table10a: Factors associated with care seeking behaviour among respondent

Variables	Care seeking behaviour		Test statistic($\chi 2$)	p-value
	Good (n=128) Freq (%)	Poor (n=308) Freq (%)		
Sex of caregiver				
Male	22 (33.8)	43 (66.2)	0.742	0.389
Female	106 (28.6)	265 (71.4)		
Age group (years)				
<40	61 (35.1)	113 (64.9)	8.989	**0.029**
40–49	54 (28.7)	134 (71.3)		
>50	11 (21.6)	40 (78.4)		
Ethnicity				
Non-Edo indigene	6 (19.4)	25 (80.6)	1.610	0.204
Edo indigene	122 (30.1)	283 (69.9)		
Education				
Non-formal	7 (16.3)	36 (83.7)	3.935	**0.047**
Formal	121 (30.8)	272 (69.2)		
Marital status				
Never married	14 (53.8)	12 (46.2)	7.995	**0.005**
Ever married	114 (27.8)	296 (72.2)		
Marriage type				
Monogamous	61 (29.0)	149 (71.0)	0.008	0.927
Polygamous	30 (28.0)	77 (72.0)		
Family type				
Nuclear	62 (39.0)	97 (61.0)	11.205	**0.001**
Extended	66 (23.8)	211 (76.2)		
Monthly income (₦)				
<70,000	29 (23.0)	97 (77.0)	10.073	**0.006**
70,000–149,000	36 (24.8)	109 (75.2)		
≥150,000	63 (38.2)	102 (61.8)		
SES				
Low	49 (28.5)	123 (71.5)	0.893	0.640
Middle	77 (29.6)	183 (70.4)		
High	2 (50.0)	2 (50.0)		
Household size				
<6	64 (36.0)	114 (64.0)	6.313	**0.012**
≥6	64 (24.8)	194 (75.2)		
Number of children				
<3	43 (39.4)	66 (60.6)	7.137	**0.008**
≥3	85 (26.0)	242 (74.0)		

The proportion of good care-seeking behaviour was slightly higher among male caregivers 22 (33.8%) compared to female caregivers 106 (28.6%), but this difference was not statistically significant ($\chi^2 = 0.742$, $p = 0.389$). Age group showed a statistically significant association with care-seeking behaviour ($\chi^2 = 8.989$, $p = 0.029$). The highest proportion of good care-seeking behaviour was among those aged 21–34 years 61 (35.1%), followed by 35–48 years 54 (28.7%), 49–62 years 11 (21.6%), and 63–75 years 2 (8.7%). Ethnicity showed no significant association ($\chi^2 = 1.610$, $p = 0.204$), with Edo indigenes at 122 (30.1%) and non-Edo indigenes at 6 (19.4%).

Education level showed a statistically significant association ($\chi^2 = 3.935$, $p = 0.047$), with those having formal education showing better care-seeking behaviour 121 (30.8%) compared to those with non-formal education 7 (16.3%). Marital status showed a statistically significant association ($\chi^2 = 7.995$, $p = 0.005$), with never-married caregivers showing better care-seeking behaviour 14 (53.8%) compared to ever-married caregivers 114 (27.8%). Marriage type showed no significant difference ($\chi^2 = 0.008$, $p = 0.927$), with monogamous at 74 (27.3%) and polygamous at 38 (27.7%). Family type showed a statistically significant association ($\chi^2 = 11.205$, $p = 0.001$), with nuclear families showing better care-seeking behaviour 62 (39.0%) compared to extended families 66 (23.8%). Monthly income showed a statistically significant association ($\chi^2 = 10.073$, $p = 0.006$). Those earning ≥150,000 naira had the highest proportion of good care-seeking behaviour 63 (38.2%), followed by 70,000–149,000 naira 36 (24.8%), and less than 70,000 naira 29 (23.0%). Household size showed a statistically significant association ($\chi^2 = 6.313$, $p = 0.012$), with those having fewer than six persons showing better care-seeking behaviour 64 (36.0%) compared to those with six or more persons 64 (24.8%). Number of children ($\chi^2=7.137$; $p=0.008$), was statistically significant. The SES showed no statistically significant association ($\chi^2=0.896$; $p= 0.640$) with high SES 2 (50%) having better care seeking behaviour than middle 77 (29.6%) and lower 49 (28.5%) SES.

Table 10b: Factors associated with care seeking behaviour among respondent

Variables	Care seeking behaviour		Test statistic($\chi 2$)	p-value
	Good (n=128) Freq(%)	Poor (n=308) Freq(%)		
Child age				
0–23 months	62 (28.1)	159 (71.9)	0.367	0.545
24–59 months	66 (30.7)	149 (69.3)		
Religion				
Christianity	98 (29.3)	237 (70.7)	0.095	0.953
Islam	22 (30.6)	50 (69.4)		
ATR	8 (27.6)	21 (72.4)		
Caregiver occupation				
Others 0*	15 (20.3)	59 (79.7)	19.017	**0.001**
Skill level 2	78 (30.2)	180 (69.8)		
Spouse occupation				
Others 0*	60 (26.2)	169 (73.8)	2..966	0.085
Skill level 2	43 (35.0)	80 (65.0)		
Sex of child				
Male	60 (28.3)	152 (71.7)	0.222	0.638
Female	68 (30.4)	156 (69.6)		
No. of U5 children				
<2	65 (34.6)	123 (65.4)	4.337	**0.037**
≥2	63 (25.4)	185 (74.6)		
Relationship to child				
Mother	95 (29.3)	229 (70.7)	10.607	**0.031**
Father	11 (25.6)	32 (74.4)		
Aunty	13 (56.5)	10 (43.5)		
Grandmother	7 (19.4)	29 (80.6)		
Others**	2 (20.0)	8 (80.0)		
Support				
Father	73 (29.6)	174 (70.4)	0.011	0.918
Others***	55 (29.1)	134 (70.9)		
Prop. of diarrhoea				
No	54 (24.1)	170 (75.9)	6.124	**0.013**
Yes	74 (34.9)	138 (65.1)		

***Skill 0,1,3,4 ** uncle *** both parents, mother, relatives**

Child age showed no significant association ($\chi^2 = 0.367$, $p = 0.545$), with those aged 24–59 months at 66 (30.7%) and 0–23 months at 62 (28.1%). Religion showed no significant association ($\chi^2 = 0.095$, $p = 0.953$), with proportions relatively similar across Christianity 98 (29.3%), Islam 22 (30.6%), and ATR 8 (27.6%). Caregiver occupation showed a statistically significant association ($\chi^2 = 19.017$, $p = 0.001$), with skill level 4 showing the highest proportion 21 (50.0%), followed by skill level 3 at 2 (100.0%), skill level 2 at 78 (30.2%), skill level 0 at 15 (20.3%), and skill level 1 at 12 (20.0%). Spouse occupation also showed a statistically significant association ($\chi^2 = 13.828$, $p = 0.008$), with skill level 4 showing the highest proportion 19 (51.4%), followed by skill level 3 at 6 (37.5%), skill level 0 at 2 (50.0%), skill level 2 at 69 (25.1%), and skill level 1 at 18 (23.1%). Sex of the child showed no significant association ($\chi^2 = 0.222$, $p = 0.638$), with females at 68 (30.4%) and males at 60 (28.3%). The number of under-five children showed a statistically significant association ($\chi^2 = 4.337$, $p = 0.037$), with those having fewer than two children showing better care-seeking behaviour 65 (34.6%) compared to those with two or more 63 (25.4%). Relationship to the child showed a statistically significant association ($\chi^2 = 10.607$, $p = 0.031$), with aunties showing the highest proportion 13 (56.5%), followed by mothers 95 (29.3%), fathers 11 (25.6%), others 2 (20.0%), and grandmothers 7 (19.4%). Financial support showed no significant association ($\chi^2 = 0.011$, $p = 0.918$), with father support at 73 (29.6%) and others at 55 (29.1%). Proportion of diarrhoea showed a statistically significant association ($\chi^2 = 6.124$, $p = 0.013$), with those who had diarrhoea showing better care-seeking behaviour 74 (34.9%) compared to those who did not 54 (24.1%).

Table11a: Predictors of good care seeking behaviour among respondent

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	−0.015	0.985	0.955	1.016	0.349
Sex of caregiver					
Male*		1			
Female	−0.334	0.716	0.334	1.535	0.391
Ethnicity					
Non-Edo indigenes*		1			
Edo indigenes	0.019	1.019	0.367	2.831	0.971
Level of education					
Non-formal*		1			
Formal	1.485	4.417	0.976	19.992	0.054
Marriage type					
Monogamous*		1			
Polygamous	0.217	1.243	0.704	2.194	0.454
Family type					
Nuclear*		1			
Extended	−0.646	0.524	0.295	0.930	**0.027**
SES					
Higher class*		1			
Middle class	0.301	1.351	0.810	2.254	0.249
Lower class	2.030	7.613	0.717	80.781	0.092
Caregiver occupation					
Skill level 2*		1			
Others	−0.227	0.797	0.468	1.356	0.402
Spouse skill level					
Skill level 2*		1			
Others	0.450	1.569	0.908	2.711	0.107
Religion					
Christianity*		1			
Other	−0.085	0.919	0.483	1.748	0.796

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

Table11b: Predictors of good care seeking behaviour among respondent

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Household size					
<6*		1			
≥ 6	-0.212	0.809	0.462	1.415	0.457
No of children					
<3		1			
≥3	-0.438	0.646	0.348	1.198	0.165
Income (₦)					
≥150000		1			
Others*	-0.614	0.541	0.310	0.944	**0.031**
Support					
Father*		1			
Others	-0.013	0.987	0.565	1.724	0.963
No. of U5					
<2*		1			
≥2	-0.119	0.888	0.507	1.555	0.678
Child age					
0-23 months*		1			
24-59 months	0.086	1.090	0.570	2.085	0.794
Sex of selected child					
Male*		1			
Female	-0.126	0.882	0.516	1.508	0.646
Relationship to U5					
Mother *		1			
others	0.453	1.574	0.787	3.148	0.200
Prop. of diarrhoea					
No*		1			
Yes	0.443	1.557	0.915	2.650	0.103

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

Multivariable logistic regression showed that most caregiver, household, and child characteristics were not significantly associated with good care-seeking behaviour ($p > 0.05$). The only significant predictors were family type and income category. Caregivers from extended families were significantly less likely to have good care-seeking behaviour compared with those from nuclear families (AOR = 0.524, 95% CI: 0.295–0.930, $p = 0.027$).

Similarly, respondents in the "others" income category were less likely to have good care-seeking behaviour compared with those earning ≥150,000 (AOR = 0.541, 95% CI: 0.310–0.944, $p = 0.031$). Formal education showed a borderline association, with respondents having formal education more likely to demonstrate good care-seeking behaviour than those without formal education (AOR = 4.417, 95% CI: 0.976–19.992, $p = 0.054$). All other variables, including caregiver age, sex, ethnicity, marital setting, socioeconomic class, occupation, religion, household size, number of children, child age/sex, respondent relationship to child, and previous diarrhoea history, were not statistically significant.

SECTION D: OPTIONS UTILIZED AND FEEDING PRACTIES AMONG CAREGIVERS OF U5 CHILDREN

Table12: Knowledge of home management of diarrheal disease

Variables	Frequency (n=436)	Percent
Awareness of ORS		
Has heard of ORS	292	67.0
Sources*		
Clinic/Hospital	223	76.4
Television	84	28.8
Radio	125	42.8
Friends	73	25.0
Family	58	19.9
Other*	30	10.3
Knows what ORS is used for	220	50.5
Belief about ORS in diarrhoea management*		
Makes child more intelligent	5	1.5
Helps to replace lost fluid	181	54.7
Causes diarrhoea	47	14.2
Prevents dehydration	98	29.6
Has heard of Zinc supplementation	143	32.8

*** Multiple response question**Newspapers, Books**

The majority of respondents had heard of ORS 292 (67.0%). Among those who had heard of ORS, the most common sources of information were: clinic/hospital 223 (76.4%), radio 125 (42.8%), television 84 (28.8%), friends 73 (25.0%), family 58 (19.9%), and other sources 30 (10.3%). Half of the respondents knew what ORS is used for 220 (50.5%). Regarding beliefs about ORS in diarrhoea management, the majority believed it helps to replace lost fluid 181 (54.7%), prevents dehydration 98 (29.6%), cures diarrhoea 47 (14.2%), and makes child more intelligent 5 (1.5%). Only 112 (25.7%) gave ORS during diarrhoea episodes. A small proportion believed home-made ORS is the same as ORS packets 35 (8.0%). Sugar Salt Solution (SSS) was given by 106 (24.3%) of caregivers. Less than a third had heard of zinc supplementation 143 (32.8%), and only 46 (10.6%) gave their child zinc tablets or syrup Other treatment options utilized included: locally prepared liquid 111 (25.5%), antibiotics 139 (31.9%), herbal or traditional medicine 88 (20.2%), and other pills or injections 49 (11.2%). Regarding breastfeeding/feeding during diarrhoea, the majority maintained the same feeding pattern 260 (59.6%), while 57 (13.1%) fed less, 45 (10.3%) had children who were not breastfed, 38 (8.7%) fed more, and 36 (8.3%) stopped feeding. For liquid intake during diarrhoea episodes, 169 (38.8%) gave less, 158 (36.2%) maintained the same amount, 87 (20.0%) gave more, and 22 (5.0%) stopped giving liquids. Regarding food intake during diarrhoea episodes, the majority reduced food intake 251 (58.0%), while 109 (25.2%) maintained the same amount, 47 (10.9%) stopped food intake, and 26 (6.0%) increased food intake. Only 96 (22.0%) monitored signs of dehydration during diarrhoea episodes.

Table 13: Home management of diarrhoea of U5

Variables	Frequency (n=436)	Percent
Gave ORS during diarrhoea episode	112	25.7
Home-made ORS same as ORS packets	35	8.0
Gave child Sugar Salt Solution (SSS)	106	24.3
How SSS is prepared (n=106)		
3tsp sugar + 1tsp salt in 500mls water	30	28.3
6tsp sugar + 1/2tsp salt in 1 litre water	14	13.2
4tsp sugar + 1tsp salt in 1 litre water	26	24.5
Do not know	36	34.0
Type of water used to prepare SSS(n=106)		
Boiled water	43	40.6
Bottled water	22	20.8
Dirty water	3	2.8
Any clean water	21	19.8
Pure water	17	16.0
How ORS is given to child		
Cup and spoon	61	54.5
Only cup	23	20.5
Feeding bottle	24	21.4
Other*	4	3.6
Gave child ORS during diarrhoea episode		
Yes	112	25.7
How long prepared ORS is kept		
24 hours	61	54.5
48 hours	9	8.0
6 hours	12	10.7
72 hours	6	5.4
Don't know	24	21.4
Gave child zinc tablets or syrup	46	10.6
Gave child locally prepared liquid	111	25.5
Gave child any antibiotics	139	31.9
Gave child herbal or traditional medicine	88	20.2
Gave child other pills or injections	49	11.2
Monitored signs of dehydration	96	22.0

***Water can, bowl**

Only 112 (25.7%) gave ORS during diarrhoea episodes. A small proportion believed home-made ORS is the same as ORS packets 35 (8.0%). Sugar Salt Solution (SSS) was given by 106 (24.3%) of caregivers. Among those who gave SSS, regarding preparation method, 36 (34.0%) did not know the correct preparation, 30 (28.3%) used 3tsp sugar + 1tsp salt in 500mls water, 26 (24.5%) used 4tsp sugar + 1tsp salt in 1 litre water, and 14 (13.2%) used 6tsp sugar + 1/2tsp salt in 1 litre water. The type of water used to prepare SSS varied: boiled water 43 (41.0%), any clean water 21 (20.0%), bottled water 21 (20.0%), pure water 17 (16.2%), and dirty water 3 (0.7%). Regarding how ORS was given to the child, cup and spoon was most common 61 (54.5%), followed by only cup 23 (20.5%), feeding bottle 24 (21.4%), and other methods 4 (3.6%).

For how long prepared ORS is kept, 61 (54.5%) said 24 hours, while 24 (21.4%) did not know, 12 (10.7%) said 6 hours, 9 (8.0%) said 48 hours, and 6 (5.4%) said 72 hours. Other treatment options utilized included: locally prepared liquid 111 (25.5%), antibiotics 139 (31.9%), herbal or traditional medicine 88 (20.2%), and other pills or injections 49 (11.2%). Regarding breastfeeding/feeding during diarrhoea, the majority maintained the same feeding pattern 260 (59.6%), while 57 (13.1%) fed less, 45 (10.3%) had children who were not breastfed, 38 (8.7%) fed more, and 36 (8.3%) stopped feeding. For liquid intake during diarrhoea episodes, 169 (38.8%) gave less, 158 (36.2%) maintained the same amount, 87 (20.0%) gave more, and 22 (5.0%) stopped giving liquids. Regarding food intake during diarrhoea episodes, the majority reduced food intake 251 (58.0%), while 109 (25.2%) maintained the same amount, 47 (10.9%) stopped food intake, and 26 (6.0%) increased food intake. Only 96 (22.0%) monitored signs of dehydration during diarrhoea episodes.

Table 14: Feeding practices during diarrheal episode of U5s

Variables	Frequency (n=436)	Percent
Breastfeeding/feeding during diarrhoea		
More	38	8.7
Same	260	59.6
Less	57	13.1
Stopped	36	8.3
Child not breastfed	45	10.3
Liquid intake during diarrhoea episode		
More	87	20.0
Same	158	36.2
Less	169	38.8
Stopped	22	5.0
Food intake during diarrhoea episode		
More	26	6.0
Same	109	25.0
Less	254	58.3
Stopped	47	10.8
Feeding practice of Caregivers of U5		
Good	212	48.6
Poor	224	51.3

Regarding breastfeeding/feeding during diarrhoea, the majority maintained the same feeding pattern 260 (59.6%), while 57 (13.1%) fed less, 45 (10.3%) had children who were not breastfed, 38 (8.7%) fed more, and 36 (8.3%) stopped feeding. For liquid intake during diarrhoea episodes, 169 (38.8%) gave less, 158 (36.2%) maintained the same amount, 87 (20.0%) gave more, and 22 (5.0%) stopped giving liquids. Regarding food intake during diarrhoea episodes, the majority reduced food intake 251 (58.0%), while 109 (25.2%) maintained the same amount, 47 (10.9%) stopped food intake, and 26 (6.0%) increased food intake. 224 (51.4%) have poor feeing practice and 212 (48.6%) have good feeding practice of U5 children with diarrhoea.

Among those who gave SSS, regarding preparation method, 36 (34.0%) did not know the correct preparation, 30 (28.3%) used 3tsp sugar + 1tsp salt in 500mls water, 26 (24.5%) used 4tsp sugar + 1tsp salt in 1 litre water, and 14 (13.2%) used 6tsp sugar + 1/2tsp salt in 1 litre water.

The type of water used to prepare SSS varied: boiled water 43 (41.0%), any clean water 21 (20.0%), bottled water 21 (20.0%), pure water 17 (16.2%), and dirty water 3 (0.7%). Regarding how ORS was given to the child, cup and spoon was most common 61 (54.5%), followed by only cup 23 (20.5%), feeding bottle 24 (21.4%), and other methods 4 (3.6%). For how long prepared ORS is kept, 61 (54.5%) said 24 hours, while 24 (21.4%) did not know, 12 (10.7%) said 6 hours, 9 (8.0%) said 48 hours, and 6 (5.4%) said 72 hours.

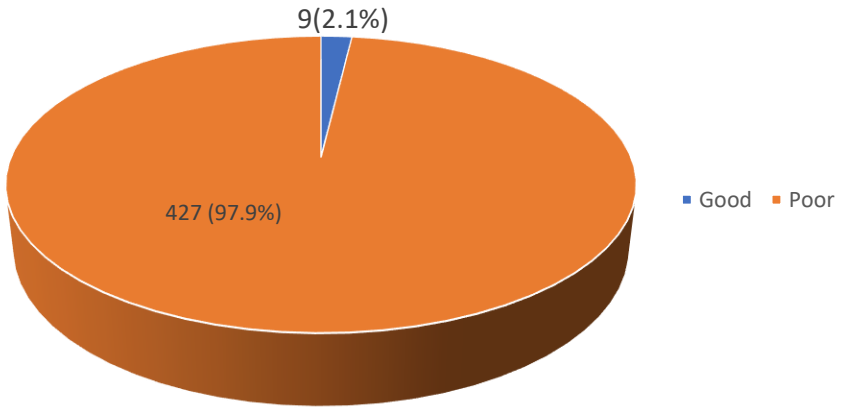

Fig.2: Level of utilization of home management diarrhoeal disease options

Figure 2 shows that only 9 (2.1%) caregivers had good utilization of diarrhoea management options, while 427 (97.9%) had poor utilization. This shows that appropriate use of recommended diarrhoea management options was extremely low among the caregivers

Table15a: Factors associated with utilization of diarrhoeal management options

Variables	Utilization of diarrhoea management		Test statistic	p-value
	Good (n=9) Freq(%)	Poor (n=427) Freq(%)		
Sex of caregiver			1.610*	0.367
Male	0 (0.0)	65 (100.0)		
Female	9 (2.4)	362 (97.6)		
Age group(years)			2.127*	0.546
<40	5 (2.9)	169 (97.1)		
40–49	4 (2.1)	184 (97.9)		
>50	0 (0.0)	51 (100.0)		
Ethnicity			0.223*	0.488
Non-Edo indigene	1 (3.2)	30 (96.8)		
Edo indigene	8 (2.0)	397 (98.0)		
Education			1.005*	0.609
Non-formal	0 (0.0)	43 (100.0)		
Formal	9 (2.3)	384 (97.7)		
Marital status			0.434*	0.428
Never married	1 (3.8)	25 (96.2)		
Ever married	8 (2.0)	402 (98.0)		
Marriage type			1.213*	0.271
Monogamous	6 (2.9)	204 (97.1)		
Polygamous	1 (0.9)	106 (99.1)		
Family type			10.900*	**0.002**
Nuclear	8 (5.0)	151 (95.0)		
Extended	1 (0.4)	276 (99.6)		
Monthly income (₦)			5.136*	0.077
<70,000	3 (2.4)	123 (97.6)		
70,000–149,000	0 (0.0)	145 (100.0)		
≥150,000	6 (3.6)	159 (96.4)		
SES				
Upper class	3 (1.7)	169 (98.3)	0.248	0.884
Middle class	6 (2.3)	254 (97.7)		
Lower class	0 (0.0)	4 (100.0)		
Household size			5.194*	**0.035**
<6	7 (3.9)	171 (96.1)		
≥6	2 (0.8)	256 (99.2)		
Number of children			0.038	0.846
<3	2 (1.8)	107 (98.2)		
≥3	7 (2.1)	320 (97.9)		

***Fishers Exact Test * *skill 0,1,3,4 ** uncle *** both parents, mother, relatives**

Most socio-demographic characteristics of caregivers were not significantly associated with utilization of diarrhoeal management options ($p > 0.05$). These included sex ($p = 0.367$), age group ($p = 0.546$), ethnicity ($p = 0.488$), education level ($p = 0.609$), marital status ($p = 0.428$), type of marriage ($p = 0.271$), monthly income ($p = 0.077$), socioeconomic status ($p = 0.884$), and number of children ($p = 0.846$). Although some categories showed slightly higher proportions of good utilization, the differences were not statistically significant.

However, family type and household size showed significant associations with utilization. Caregivers from nuclear families had a higher proportion of good utilization, 8 (5.0%), compared with those from extended families, 1 (0.4%) ($\chi^2 = 10.900$, $p = 0.002$). Similarly, households with fewer than 6 members recorded better utilization, 7 (3.9%), than households with 6 or more members, 2 (0.8%) ($\chi^2 = 5.194$, $p = 0.035$).

Overall, good utilization of diarrhoeal management options was generally low across all socio-demographic groups, with only family structure and smaller household size demonstrating significant influence.

Table15b: Factors associated with utilization of diarrhoeal management options

Variables	Utilization of diarrhoea mgt		Test statistic	p-value
	Good (n=9) Freq(%)	Poor (n=427) Freq(%)		
Child age			0.087*	1.000
0–23 months	5 (2.3)	216 (97.7)		
24–59 months	4 (1.9)	211 (98.1)		
Religion			0.947*	0.623
Christianity	8 (2.4)	327 (97.6)		
Islam	1 (1.4)	71 (98.6)		
African Traditional Religion	0 (0.0)	29 (100.0)		
Caregiver skill level			2.540	0.111
skill level 2	3 (1.2)	255 (98.8)		
Others*	6 (3.4)	172 (96.6)		
Spouse skill level			5.778*	**0.016**
skill level 2	2 (0.9)	227 (99.1)		
Others*	6 (4.9)	117 (95.1)		
Sex of selected child			1.198*	0.327
Male	6 (2.8)	206 (97.2)		
Female	3 (1.3)	221 (98.7)		
Number of U5 children			0.579*	0.508
<2	5 (2.7)	183 (97.3)		
≥2	4 (1.6)	244 (98.4)		
Relationship with the child			3.177*	0.529
Mother	9 (2.8)	315 (97.2)		
Father	0 (0.0)	43 (100.0)		
Aunty	0 (0.0)	23 (100.0)		
Grandmother	0 (0.0)	36 (100.0)		
Others**	0 (0.0)	10 (100.0)		
Support Financially			0.375*	0.738
Father	6 (2.4)	241 (97.6)		
Others***	3 (1.6)	186 (98.4)		
Prop. with diarrhoea			0.860*	0.505
No	6 (2.7)	218 (97.3)		
Yes	3 (1.4)	209 (98.6)		
Care-seeking behaviour			15.704*	**<0.001**
Good	8 (6.3)	120 (93.8)		
Poor	1 (0.3)	307 (99.7)		

***Skill 0,1,3,4 ** uncle, siblings *** both parents, mother, relatives**

Most child, caregiver, and household-related factors were not significantly associated with utilization of diarrhoeal management options ($p > 0.05$). These included child age ($p = 1.000$), religion ($p = 0.623$), caregiver occupation skill level ($p = 0.111$), sex of the selected child ($p = 0.327$), number of under-five children ($p = 0.508$), relationship with the child ($p = 0.529$), financial support ($p = 0.738$), and history of diarrhoea ($p = 0.505$). Although some groups had slightly higher proportions of good utilization, these differences were not statistically significant.

However, spouse occupation skill level and care-seeking behaviour were significantly associated with utilization. Respondents whose spouses were in other skill levels had higher good utilization 6 (4.9%) compared with those whose spouses were in skill level 2, 2 (0.9%) ($\chi^2 = 5.778$, $p = 0.016$). Care-seeking behaviour showed the strongest association, as caregivers with good care-seeking behaviour had substantially higher good utilization 8 (6.3%) compared with those with poor care-seeking behaviour 1 (0.3%) ($\chi^2 = 15.704$, $p < 0.001$).

In addition, utilization of management options appeared related to feeding practices. Among caregivers with good utilization, 8 (88.9%) had good feeding practices and 1 (11.1%) had poor feeding practices, whereas among those with poor utilization, 204 (47.8%) had good feeding practices and 223 (52.2%) had poor feeding practices. Overall, good utilization remained low across most groups, with spouse occupation and care-seeking behaviour emerging as important factors.

Table16a: Predictors of good utilization of management option among care givers of U5

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age of caregiver (years)	-0.065	0.937	0.745	1.180	0.582
Sex of caregiver					
Male*		1			
Female	13.603	808170.444	0.000	.	0.997
Ethnicity					
Non Edo indigenes*		1			
Edo indigenes	-3.096	0.045	0.000	139.644	0.450
Education					
Non-Formal*		1			
formal	16.116	9982458.919	0.000	.	0.997
Marriage type					
Monogamous*		1			
Polygamous	-0.190	0.827	0.012	57.477	0.930
Family type					
Nuclear*		1			
Extended	-1.681	0.186	0.002	21.362	0.487
Caregiver skill level					
Skill level 2 *		1			
others	3.218	24.969	0.360	1732.400	0.137
Spouse skill level					
Skill level 2*		1			
Others	2.446	11.538	0.601	221.416	0.105
Religion					
Christianity*		1			
Other	-2.250	0.105	0.001	9.918	0.332

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

For every one-year increase in caregiver age, respondents were 0.937 (95% CI = 0.745 – 1.180, p = 0.582) times less likely to have the outcome, but this association was not statistically significant. Female caregivers had an extremely large odds ratio (OR = 808170.444, p = 0.997) with an unstable confidence interval, indicating a likely sparse data or model estimation issue; this association was not statistically significant. Edo indigenes were 0.045 (95% CI = 0.000 – 139.644, p = 0.450) times less likely to have the outcome compared to non-Edo indigenes, but this association was not statistically significant.

Caregivers with formal education had an extremely large odds ratio (OR = 9982458.919, p = 0.997) with an unstable confidence interval, suggesting a sparse data or model instability issue; this was not statistically significant. Those in polygamous marriages were 0.827 (95% CI = 0.012 – 57.477, p = 0.930) times less likely to have the outcome compared to those in monogamous marriages, but this was not statistically significant. Caregivers from extended families were 0.186 (95% CI = 0.002 – 21.362, p = 0.487) times less likely to have the outcome compared to those from nuclear families, but this association was not statistically significant.

Caregivers in other occupational skill levels were 24.969 (95% CI = 0.360 – 1732.400, p = 0.137) times more likely to have the outcome compared to those in skill level 2, but this was not statistically significant. Spouses in other occupational skill levels were 11.538 (95% CI = 0.601 – 221.416, p = 0.105) times more likely to have the outcome compared to those in skill level 2, but this association was not statistically significant. Respondents practicing religions other than Christianity were 0.105 (95% CI = 0.001 – 9.918, p = 0.332) times less likely to have the outcome compared to Christians, but this was not statistically significant.

Table16b: predictors of good utilization of management option among care givers of U5

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Household size					
<6*		1			
≥ 6	-3.134	0.044	0.000	22.679	0.326
Number of children					
<3		1			
≥3	3.492	32.842	0.169	6368.237	0.194
Income					
≥150000*		1			
Others	0.168	1.183	0.034	41.072	0.926
Support					
Father*		1			
Others	0.250	1.284	0.092	17.929	0.853
No. of U5					
<2*		1			
≥2	0.272	1.313	0.065	26.480	0.859
Child age					
0-23 months*		1			
24-59 months	0.492	1.636	0.036	73.449	0.800
Sex of selected child					
Male*		1			
female	-1.035	0.355	0.012	10.386	0.548
Relationship with U5					
Mother *		1			
others	13.262	575023.872	0.000	.	0.996
Prop. with diarrhoea					
No*		1			
Yes	-4.033	0.018	0.000	2.122	0.099
Care seeking behaviour					
Poor*		1			
Good	20.240	616957477.712	0.000	.	0.991

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

Overall, none of the predictors examined were statistically significantly associated with good utilization of management options among caregivers (all $p > 0.05$). Household size ≥6 members was associated with lower odds of good utilization (OR = 0.044, 95% CI: 0.000–22.679, p = 0.326), while caregivers of children with diarrhoea also had lower odds (OR = 0.018, 95% CI: 0.000–2.122, p = 0.099), though neither was significant. Higher odds of good utilization were observed among respondents with ≥3 children (OR = 32.842, 95% CI: 0.169–6368.237, p = 0.194), income <₦150,000 (OR = 1.183, 95% CI: 0.034–41.072, p = 0.926), support from others rather than fathers (OR = 1.284, 95% CI: 0.092–17.929, p = 0.853), ≥2 under-five children (OR = 1.313, 95% CI: 0.065–26.480, p = 0.859), and child age 24–59 months (OR = 1.636, 95% CI: 0.036–73.449, p = 0.800), but these were also not significant. Female children had lower odds compared with males (OR = 0.355, 95% CI: 0.012–10.386, p = 0.548). Extremely large odds ratios for non-mother caregivers (OR = 575023.872, p = 0.996) and good care-seeking behaviour (OR = 616957477.712, p = 0.991) with unstable confidence intervals suggest sparse data or model estimation issues rather than meaningful associations.

Table17a: Factors associated with feeding practice among care givers of U5 children

Variables	Feeding practice		Test statistic	p-value
	Good (n=212) Freq(%)	Poor (n=224) Freq(%)		
Sex of caregiver				
Male	29 (44.6)	36 (55.4)	0.491	0.483
Female	183 (49.3)	188 (50.7)		
Age group (years)				
< 40	130 (50.0)	130 (50.0)	0.490	0.783
40–49	50 (46.7)	57 (53.3)		
≥ 50	32 (46.4)	37 (53.6)		
Ethnicity				
Non-Edo	16 (51.6)	15 (48.4)	0.119	0.730
Edo	196 (48.4)	209 (51.6)		
Education				
Non-formal	21 (48.8)	22 (51.2)	0.001	0.976
Formal	191 (48.6)	202 (51.4)		
Marital status				
Never married	16 (61.5)	10 (38.5)	1.846	0.174
Ever married	196 (47.8)	214 (52.2)		
Marriage type				
Monogamous	106 (50.5)	104 (49.5)	2.015	0.156
Polygamous	45 (42.1)	62 (57.9)		
Family type				
Nuclear	73 (45.9)	86 (54.1)	0.737	0.391
Extended	139 (50.2)	138 (49.8)		
Monthly income				
<70,000	67 (53.2)	59 (46.8)	2.227	0.328
70,000–149,000	64 (44.1)	81 (55.9)		
≥150,000	81 (49.1)	84 (50.9)		
SES				
Upper class	83 (48.3%)	89 (51.7)	0.018	0.991
Middle class	127 (48.8%)	133 (51.2)		
Lower class	2 (50.0%)	2 (50.0)		
Household size				
<6	83 (46.6)	95 (53.4)	0.479	0.489
≥6	129 (50.0)	129 (50.0)		
Number of children				
<3	55 (50.5)	54 (49.5)	0.196	0.658
≥3	157 (48.0)	170 (52.0)		

*****Uncles ** skill level 0,1,3,4**

Most socio-demographic characteristics of caregivers were not significantly associated with feeding practices ($p > 0.05$). Although some categories showed higher proportions of good feeding practices, these differences were not statistically significant.

With regard to sex, female caregivers had a slightly higher proportion of good feeding practices, 183 (49.3%), compared with males, 29 (44.6%). While, caregivers aged 63–75 years recorded the highest proportion of good feeding practices, 14 (60.9%), followed by those aged 21–34 years, 90 (51.7%). Caregivers aged 49–62 years had the lowest proportion, 21 (41.2%). Ethnic distribution was similar, with non-Edo caregivers showing 16 (51.6%) good feeding practices compared with 196 (48.4%) among Edo caregivers.

Educational status showed almost identical proportions, as caregivers with non-formal education had 21 (48.8%) good feeding practices, while those with formal education had 191 (48.6%). Never-married caregivers had a higher proportion of good feeding practices, 16 (61.5%), compared with ever-married caregivers, 196 (47.8%). Similarly, caregivers in monogamous unions had better feeding practices, 137 (50.6%), than those in polygamous unions, 58 (42.3%). Caregivers from extended families had 139 (50.2%) good feeding practices compared with 73 (45.9%) from nuclear families. Households with six or more members had 129 (50.0%) good feeding practices, while those with fewer than six members had 83 (46.6%). By income level, caregivers earning less than ₦70,000 had the highest proportion of good feeding practices, 67 (53.2%), compared with 64 (44.1%) among those earning ₦70,000–149,000 and 81 (49.1%) among those earning ≥₦150,000.

Overall, feeding practices were fairly evenly distributed across socio-demographic groups, and none of the examined caregiver characteristics showed a statistically significant influence.

Table17b: Factors associated with feeding practice among care givers of U5 children

Variables	Feeding practice		Test statistic	p-value
	Good (n=212) Freq(%)	Poor (n=224) Freq(%)		
Child age group				
0–23 months	114 (51.6)	107 (48.4)	1.572	0.210
24–59 months	98 (45.6)	117 (54.4)		
Religion				
Christianity	164 (49.0)	171 (51.0)	2.833	0.243
Islam	38 (52.8)	34 (47.2)		
African Traditional Religion	10 (34.5)	19 (65.5)		
Caregiver occupation skill level				
Others	86 (48.3)	92 (51.7)	0.012	0.915
skill 2	126 (48.8)	132 (51.2)		
Spouse occupation skill level				
Others	59 (48.0)	64 (52.0)	0.008	0.928
Skill 2	111 (48.5)	118 (51.5)		
Sex of child				
Male	99 (46.7)	113 (53.3)	0.613	0.434
Female	113 (50.4)	111 (49.6)		
No. of U5 children				
≥2	122 (49.2)	126 (50.8)	0.075	0.785
<2	90 (47.9)	98 (52.1)		
Relationship to child				
Mother	156 (48.1)	168 (51.9)	3.236	0.519
Father	17 (39.5)	26 (60.5)		
Aunty	13 (56.5)	10 (43.5)		
Grandmother	20 (55.6)	16 (44.4)		
Others***	6 (60.0)	4 (40.0)		
Support				
Others	98 (51.9)	91 (48.1)	1.392	0.238
Father	114 (46.2)	133 (53.8)		
Prop. with diarrhoea				
No	115 (51.3)	109 (48.7)	1.360	0.244
Yes	97 (45.8)	115 (54.2)		
Care-seeking behaviour				
Good	66 (51.6)	62 (48.4)	0.626	0.429
Poor	146 (47.4)	162 (52.6)		
Utilization of management options				
Poor	204 (47.8)	223 (52.2)	5.964	**0.015**
Good	8 (89.9)	1 (11.1)		

***Uncles, siblings**

Most children, caregiver, and household-related factors were not significantly associated with feeding practices ($p > 0.05$). These included child age group ($\chi^2 = 1.572$, $p = 0.210$), religion ($\chi^2 = 2.833$, $p = 0.243$), sex of the child ($\chi^2 = 0.613$, $p = 0.434$), number of under-five children ($\chi^2 = 0.075$, $p = 0.785$), relationship to the child ($\chi^2 = 3.236$, $p = 0.519$), support system ($\chi^2 = 1.392$, $p = 0.238$), history of diarrhoea ($\chi^2 = 1.360$, $p = 0.244$), and care-seeking behaviour ($\chi^2 = 0.626$, $p = 0.429$).

Caregivers of children aged 0–23 months had slightly higher good feeding practices, 114 (51.6%), than those with children aged 24–59 months, 98 (45.6%). Muslims had the highest proportion of good feeding practices, 38 (52.8%), followed by Christians, 164 (49.0%), while African Traditional Religion had the lowest, 10 (34.5%). Female children had slightly better feeding practices, 113 (50.4%), than males, 99 (46.7%).

Relationship to the child showed variation, with mothers having 156 (48.1%) good feeding practices, fathers 17 (39.5%), aunties 13 (56.5%), grandmothers 20 (55.6%), and others 6 (60.0%). Caregivers supported by others had better feeding practices, 98 (51.9%), than those supported by fathers, 114 (46.2%). Caregivers of children without diarrhoea also had higher good feeding practices, 115 (51.3%), than those with diarrhoea, 97 (45.8%). Spouse occupation skill level also wasn't significant ($\chi^2 = 0.008$, $p = 0.928$).

Utilization of management options was the only factor significantly associated with feeding practice ($\chi^2 = 5.964$, $p = 0.015$). Caregivers with good utilization of management options had a markedly higher proportion of good feeding practices, 8 (88.9%), compared with those with poor utilization, where 204 (47.8%) had good feeding practices. This suggests that appropriate utilization of diarrhoea management options may positively influence feeding practices during diarrhoeal episodes.

Table 18a: Predictors of good feeding practice among caregivers of U5 children

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age of caregiver (years)	-0.017	0.983	0.958	1.008	0.174
Sex of caregiver					
Male*		1			
Female	0.487	1.627	0.799	3.314	0.180
Ethnicity					
Non Edo indigenes*		1			
Edo indigenes	0.429	1.536	0.617	3.825	0.356
Education					
Non-Formal*		1			
Formal	0.172	1.188	0.501	2.817	0.696
Marriage type					
Monogamous*		1			
Polygamous	-0.358	0.699	0.423	1.155	0.162
Family type					
Nuclear*		1			
Extended	0.377	1.458	0.859	2.473	0.162
Caregiver occupation					
Skill level 2 *		1			
others	-0.146	0.864	0.536	1.393	0.548
Spouse skill level					
Skill level 2*		1			
Others	-0.146	0.864	0.522	1.429	0.570
SES					
Upper class*		1			
Middle class	0.301	1.351	0.810	2.254	0.249
Lower class	2.030	7.613	0.717	80.781	0.092
Religion					
Christianity*		1			
Other	0.147	1.158	0.662	2.027	0.607
Household size					
<6*		1			
≥ 6	0.344	1.411	0.852	2.336	0.181
Number of children					
<3		1			
≥3	3.492	32.842	0.169	6368.237	0.194

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

Table 18b: Predictors of good feeding practice among caregivers of U5 children

Predictors	β	Odds ratio	95% CI for OR		p-value
			Upper	Lower	
Income					
≥150000*		1			
Others	0.061	1.063	0.636	1.778	0.815
Support					
Father*		1			
Others	0.194	1.214	0.741	1.987	0.441
No. of U5					
<2*		1			
≥2	-0.131	0.877	0.581	1.324	0.533
Child age acceptable					
0-23 months*		1			
24-59 months	0.229	1.257	0.832	1.900	0.277
Sex of selected child					
Male*		1			
Female	0.231	1.260	0.784	2.025	0.339
Relationship with U5					
Mother *		1			
Others	-0.320	0.726	0.409	1.291	0.276
Proportion of diarrhoea					
No*		1			
Yes	-0.170	0.844	0.527	1.351	0.479
Care-seeking behaviour					
Poor*		1			
Good	0.377	1.458	0.844	2.518	0.176
Utilization of diarrhoea mgt					
Poor *		1			
Good	21.367	1903263458.549	0.000	.	0.999

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

Overall, none of the predictors were significantly associated with good feeding practices (all p > 0.05). Increasing caregiver age slightly reduced the likelihood of good feeding practices (OR = 0.983, 95% CI: 0.958–1.008, p = 0.174), but this was not significant. Female caregivers (OR = 1.627, p = 0.180), Edo indigenes (OR = 1.536, p = 0.356), and caregivers with formal education (OR = 1.188, p = 0.696) all showed higher odds of good feeding practices, but without statistical significance. Similarly, polygamous marriage (OR = 0.699, p = 0.162), extended family type (OR = 1.458, p = 0.162), higher household size ≥6 (OR = 1.411, p = 0.181), and lower income <₦150,000 (OR = 1.063, p = 0.815) were not significantly associated with feeding practices.

Caregiver occupation level (OR = 0.864, p = 0.548) and spouse occupation level (OR = 0.864, p = 0.570) also showed no significant associations. Other non-significant factors included religion (OR = 1.158, p = 0.607), number of children ≥3 (OR = 32.842, p = 0.194), support system (OR = 1.214, p = 0.441), child age 24–59 months (OR = 1.257, p = 0.277), female child sex (OR = 1.260, p = 0.339), caregiver relationship to child (OR = 0.726, p = 0.276), history of diarrhoea (OR = 0.844, p = 0.479), and care-seeking behaviour (OR = 1.458, p = 0.176).

Caregivers with good utilization of diarrhoea management showed an extremely large odds ratio (OR = 1.90×10^9, p = 0.999) with an unstable confidence interval, suggesting sparse data or model instability rather than a meaningful association. Overall, no independent predictor of good feeding practices reached statistical significance.

SECTION E: FACTORS ASSOCIATED WITH MANAGEMENT OF DIARRHOEA DISEASE BY CAREGIVERS

Table19: Factors associated with diarrhoea management

Variables	Frequency n =436	Percent
Received prior information on diarrhoea management	202	46.3
Source of diarrhoea information*		
Health worker	148	73.3
Radio	58	28.7
TV	54	26.7
Family	60	29.7
Friends	44	21.8
Church	30	14.9
Other#	15	7.4
Main source of drinking water		
Borehole	181	41.5
Sachet water	154	35.3
Tap water	70	16.1
Well water	24	5.5
River/Stream	7	1.6
Treats water before drinking	140	32.1
Water treatment method		
Boiling	92	65.7
Filtration	19	13.6
Chlorination	15	10.7
Other**	14	10.0
Where household members defecate		
Water Closet	377	86.5
Pit latrine	38	8.7
Open defecation	21	4.8
Handwash occasion*		
Before preparing food	237	54.4
Before feeding a child	237	54.4
After using the toilet	285	65.4
After cleaning child's stool	238	54.6
Before eating	268	61.5
After working/dirty tasks	161	36.9
Cultural beliefs influence diarrhoea management	150	34.4
Cultural beliefs include*		
Teething causes diarrhoea	117	78.0
Diarrhoea cleanses the body	39	26.0
Coconut water cures diarrhoea	70	46.7
Other beliefs***	14	9.3

***multiple response question **sieving ***giving fluid increases diarrhoea, too much breastfeeding causes diarrhoea #newspapers**

Less than half of the respondents had received prior information on diarrhoea management 202 (46.3%). Among those who received information, the sources included: health workers 149 (72.3%), family 61 (29.6%), radio 59 (28.6%), television 56 (27.2%), friends 44 (21.4%), church 30 (14.6%), and other sources 15(7.3%). Regarding the main source of drinking water, borehole was most common 181 (41.5%), followed by sachet water 154 (35.3%), tap water 70 (16.1%), well water 24 (5.5%), and river/stream 7 (1.6%). Only 140 (32.1%) treated water before drinking. Among those who treated water, the methods used were: boiling 92 (66.2%), filtration 18 (12.9%), chlorination 15 (10.8%), and other methods 14 (10.1%). Regarding where household members defecate, the majority used water closets 377 (86.5%), while 38 (8.7%) used pit latrines, and 21 (4.8%) practiced open defecation.
For handwashing occasions, the most common were: after using the toilet 285 (65.4%), before eating 268 (61.5%), before feeding a child 237 (54.4%), before preparing food 237 (54.4%), after cleaning child's stool 238 (54.6%), and after working/dirty tasks 161 (36.9%). Cultural beliefs influenced diarrhoea management in 150 (34.4%) of cases. Among these beliefs, teething causes diarrhoea was most common 117 (78.0%), followed by coconut water cures diarrhoea 70 (46.7%), diarrhoea cleanses the body 39 (26.0%), and other beliefs 14 (9.3%).

CHAPTER FIVE

DISCUSSION

This study assessed the household management of childhood diarrhoea among 436 caregivers of children under five years in Ovia North East Local Government Area of Edo State, Nigeria. The findings are discussed below in line with the specific objectives of the study.

This study found that nearly half of the under-five children had experienced diarrhoea within the two weeks preceding the survey, with about one in three having passed stool three or more times within the last twenty-four hours of the episode, and slightly over one-quarter reporting blood in stool during the diarrhoeal episode. Additionally, in the six months preceding the study, about one-third reported two episodes, over one-quarter reported one episode, nearly one-quarter reported three or more episodes, and nearly one in five reported no episode suggesting both high transmission intensity and potential occurrence of invasive enteric infections. The observed burden is likely driven by interacting environmental, behavioural, and structural determinants. Ovia North East Local Government Area is characterised by limited access to clean water and adequate sanitation infrastructure, with many communities relying on boreholes, wells, and streams that may be contaminated with faecal matter, creating an environment conducive to the transmission of diarrhoeal pathogens such as rotavirus, Shigella, and norovirus[47]. These risks are compounded by overcrowded living conditions typical of semi-urban extended family settlements, which facilitate rapid intra-household spread among young children with close contact patterns. Additionally, the study area's tropical climate with seasonal rainfall patterns contributes to periodic flooding and contamination of water sources, while inadequate waste disposal systems and open defecation in some communities perpetuate the faecal-oral transmission cycle[47]. The relatively high educational attainment and

socioeconomic status of respondents did not translate into significantly lower diarrhoea prevalence, suggesting that structural and environmental factors may override individual-level knowledge and resources in determining disease burden. This is consistent with findings from a descriptive cross-sectional study conducted among 660 caregivers of children under five years in Calabar-South, Cross River State, Nigeria, which reported that half of the caregivers had children who experienced diarrhoea despite high levels of knowledge about diarrhoea prevention[5]. A comparable pattern was observed in a systematic review and meta-analysis of thirty-one observational studies involving 22,744 children from multiple regions in Ethiopia, which found a pooled prevalence of diarrhoea of twenty-two per cent, with the highest prevalence recorded in Afar at twenty-seven per cent, and key determinants including lack of maternal education, absence of latrines, and poor handwashing practices[17]. This sustained burden has major public health implications, including increased risk of dehydration, malnutrition, growth faltering, repeated healthcare expenditures, and preventable childhood morbidity[4,17,47]. It therefore highlights the urgent need for integrated water, sanitation, and hygiene interventions alongside community-level behaviour change strategies. The Ovia North East Local Government Council, through its Primary Health Care Department and Environmental Health/WASH Unit, should prioritise large-scale Water, Sanitation and Hygiene (WASH) interventions in communities with poor access to safe water. These should include the construction of boreholes with mechanised pumping systems, provision of subsidised household water treatment products such as chlorine tablets and ceramic filters, and establishment of sanitation facilities including communal latrines in areas where open defecation persists. Behaviour change communication strategies should also be strengthened through community health workers, religious institutions, schools, local radio stations, and market sensitisation campaigns to improve hygiene practices such as handwashing, safe water storage, and prompt treatment of childhood diarrhoea[4,47]. In addition, communities should be

encouraged to undertake self-help sanitation initiatives such as environmental clean-up exercises, drainage maintenance, and locally led toilet construction projects to complement government efforts and address both the infrastructural and behavioural determinants of childhood diarrhoea.[4,47]

Ethnicity was significantly associated with the proportion of diarrhoea among under-five children, with non-Edo indigenes having a significantly higher proportion of diarrhoea compared to Edo indigenes. This finding suggests underlying inequities in exposure to risk factors and access to protective resources within the same geographic setting. A plausible explanation is that non-Edo indigenes in Ovia North East Local Government Area are likely to be migrants or temporary residents who may live in more precarious housing conditions with less secure access to clean water and sanitation facilities compared to indigenous Edo populations who often have established family compounds with more reliable infrastructure[47]. Migrant families may also face socioeconomic disadvantages including lower income, reduced social capital, and limited access to healthcare services due to lack of familiarity with the local health system and potential language barriers when interacting with healthcare providers who predominantly speak Edo or English[48]. Additionally, cultural practices related to child feeding, water storage, food preparation, and hygiene may differ between ethnic groups, and non-Edo caregivers may be less integrated into community health education programmes or may rely more heavily on traditional remedies and informal healthcare providers than on biomedical services[20,48]. The transient nature of some migrant populations may also disrupt continuity of preventive care such as routine immunisation including rotavirus vaccination, which is a critical determinant of diarrhoea prevention[4,15]. This is consistent with findings from a community-based analytical cross-sectional study conducted among 238 caregivers of children under five with diarrhoea in Maun, Botswana, which found that socioeconomic status and caregiver characteristics including migrant status influenced health-seeking behaviour and

access to appropriate care[19]. Similarly, a systematic review and meta-analysis involving studies from multiple regions in Ethiopia reported that urban residence was associated with higher diarrhoea prevalence, suggesting that migration and displacement may create conditions that increase vulnerability to diarrhoeal disease[17]. This finding is significant because it highlights the existence of health inequities based on ethnicity and migration status, which can perpetuate cycles of poverty and ill health among vulnerable sub-populations and undermine efforts to achieve universal child health coverage[17,48]. The local government health authority should prioritise and seek support from state government in order to establish targeted outreach programmes for members of the communities, including mobile health clinics that provide free or subsidised maternal and child health services, culturally sensitive health education delivered in multiple languages by bilingual community health workers, and partnership with ethnic community associations and religious leaders to facilitate health promotion activities and improve access to preventive and curative services for diarrhoeal disease.

Child age was significantly associated with diarrhoea proportion, with children aged twenty-four to fifty-nine months having a significantly higher proportion of diarrhoea compared to those aged zero to twenty-three months. The probable reason for this finding is multi-layered and somewhat counterintuitive given that younger infants are often considered more vulnerable to infectious diseases. Children in the older age group are more mobile and exploratory, engaging in crawling, walking, and playing activities that bring them into contact with contaminated surfaces, soil, and objects in the household and outdoor environment, thereby increasing their exposure to faecal-oral pathogens[17,47]. This age group is also more likely to consume complementary foods and family meals that may be prepared or stored under unhygienic conditions, whereas younger infants who are predominantly breastfed benefit from the protective antimicrobial and immunological properties of breast milk which reduce susceptibility to enteric infections[30,49]. Additionally, caregivers may exercise closer supervision

and more meticulous hygiene practices for younger infants, whereas older toddlers are often allowed greater autonomy and may engage in behaviours such as putting dirty hands and objects in their mouths without constant parental oversight[49]. The transition from exclusive breastfeeding to mixed feeding and family foods also introduces new sources of microbial contamination, particularly in settings where food hygiene and safe water for food preparation are inadequate[49]. Furthermore, maternal antibodies acquired trans-placentally and through breast milk provide passive immunity that wanes as the child grows older, leaving toddlers in the twenty-four to fifty-nine months age group more vulnerable to infections despite their developing immune systems[30,49]. This is consistent with findings from an analytical cross-sectional hospital-based surveillance study conducted from 2017 to 2018 across twenty-eight low- and middle-income countries including Nigeria, which found that Shigella was more prevalent in older children aged twenty-four to fifty-nine months compared to younger infants[15]. Similarly, a community-based descriptive cross-sectional study conducted in 2019 in Bereh District, Oromia, Ethiopia, found that the lack of exclusive breastfeeding significantly increased the risk of diarrhoea, highlighting the protective effect of breastfeeding in younger infants and the increased vulnerability of older children who have transitioned to complementary feeding[30]. This finding is significant because it identifies a specific age group that is particularly vulnerable to diarrhoeal disease and requires intensified preventive and management interventions to reduce morbidity and mortality[15,30]. Primary health centres in Ovia North East Local Government Area should intensify health education for mothers during immunisation clinics and child welfare visits, emphasising the importance of continued hygiene vigilance as children transition from infancy to toddlerhood, providing practical demonstrations on safe food preparation and storage, handwashing before feeding, and environmental sanitation to reduce contamination of play areas, and promoting rotavirus vaccination which is particularly effective in preventing severe diarrhoea in this age group.

This study found that less than half of caregivers sought advice or treatment outside the home when their children had diarrhoea, and among those who sought external care, government hospitals were the most common first point of care, followed by health centres, private clinics, pharmacies, and community health workers, while traditional healers, relatives or friends, and churches accounted for smaller proportions. The reasons for choosing a particular care site varied, with trust in the care provider being most frequently cited, followed by close distance, affordability, quick service, availability of drugs, and previous good experience. Decision-making regarding care-seeking was predominantly by mothers, though fathers and both parents jointly also played important roles, while grandparents and other relatives had limited decision-making authority. Overall, poor care-seeking behaviour predominated, with more than two-thirds of caregivers demonstrating inadequate care-seeking practices. The probable reason for this pattern is multi-layered. The relatively low rate of external care-seeking may reflect financial constraints, as many households in the study area earn modest incomes and perceive healthcare costs including transportation, consultation fees, and medication as prohibitive, particularly for a condition like diarrhoea which is often perceived as self-limiting and manageable at home[24,50]. Geographical barriers also play a role, as some communities in Ovia North East are located far from health facilities, and poor road conditions especially during the rainy season make travel difficult and time-consuming, discouraging caregivers from seeking timely professional care[47,50]. Cultural beliefs about diarrhoea causation, including attributions to teething, spiritual attacks, or dietary indiscretions, may lead caregivers to prioritise traditional remedies or home management over biomedical care, particularly in the initial stages of illness[20,31]. The predominance of mothers in care-seeking decisions reflects the gendered division of caregiving responsibilities in Nigerian households, where women bear primary responsibility for child health despite often having limited financial autonomy and requiring spousal permission to seek medical care, which can introduce delays[20,22]. Trust in

care providers emerged as the most important factor in choice of care site, suggesting that the quality of previous interactions with healthcare workers, perceived competence, and respectful treatment are critical determinants of healthcare utilisation, while proximity and affordability also matter significantly in a resource-constrained setting[18,19]. This is consistent with findings from a community-based analytical cross-sectional study conducted among 624 mothers and caregivers in Dangila Zuria Woreda, Northwest Ethiopia, which found that nearly four-fifths of caregivers sought care from health facilities, with key facilitating factors including higher education levels, male child sex, severity of illness, and proximity to health facilities[18]. In contrast, a descriptive cross-sectional study conducted in Calabar-South, Nigeria, found that despite high knowledge levels, only fourteen per cent of caregivers sought hospital care when their children had diarrhoea, while forty-two per cent resorted to self-medication, highlighting a significant knowledge-practice gap[5]. This finding has important public health implications because delayed or absent care-seeking for childhood diarrhoea increases the risk of severe dehydration, electrolyte imbalances, and death, particularly in young infants and children with comorbidities such as malnutrition or HIV infection[4,17], and reliance on inappropriate home remedies or self-medication with antibiotics contributes to antimicrobial resistance and treatment failure[27]. Community health workers in Ovia North East should be trained and equipped to conduct household visits for active case-finding of diarrhoeal disease, provide on-site assessment and triage using simple tools such as dehydration assessment charts, administer oral rehydration solution and zinc supplements for uncomplicated cases, and facilitate referral of severe cases to health facilities, thereby reducing geographical and financial barriers to care and improving early recognition and treatment of childhood diarrhoea.

Age group of caregivers was significantly associated with care-seeking behaviour, with caregivers aged less than forty years demonstrating better care-seeking behaviour compared to older age groups. This suggests that caregiver age may influence how childhood illness is

recognised, interpreted, and managed within the household. The probable reason for this finding is multifactorial. Younger caregivers, particularly those in their twenties and thirties, are more likely to have received formal education in recent decades when school enrolment rates in Nigeria improved significantly[39], and are therefore more literate and better able to comprehend health education messages delivered through mass media, posters, and healthcare provider counselling[18]. This cohort may also be more open to modern biomedical practices and less entrenched in traditional beliefs about illness causation and treatment, making them more willing to seek professional healthcare for their children[19,21]. Additionally, younger mothers may have had more recent contact with antenatal and postnatal care services where they received health education about childhood illnesses including diarrhoea, whereas older caregivers who had their children many years ago may not have benefited from contemporary maternal and child health programmes. Younger caregivers may also be more physically mobile and less burdened by chronic health conditions, enabling them to travel to health facilities more easily than older grandmothers or elderly caregivers who may face mobility challenges[22]. Furthermore, generational differences in attitudes toward healthcare authority and patient agency may play a role, with younger individuals more inclined to question traditional practices and seek evidence-based care[21]. However, it is also possible that older caregivers have greater caregiving experience and confidence in managing common childhood illnesses at home, leading them to seek external care only for more severe symptoms. This is consistent with findings from a descriptive cross-sectional study conducted in Maun, Botswana, which found that younger caregivers aged fifteen to twenty-five years were more likely to demonstrate appropriate health-seeking behaviour including seeking care within twenty-four hours and using oral rehydration salts[19]. Similarly, a cross-sectional quantitative study conducted in Botswana in 2023 found that educational level of caregivers and awareness of diarrhoea danger signs were positively associated with health facility utilisation, with younger and better-

educated caregivers being more likely to seek professional healthcare[21]. This finding is significant because it suggests that age-related differences in health literacy, healthcare attitudes, and access to health information contribute to disparities in care-seeking behaviour, with potential consequences for child health outcomes if older caregivers delay seeking care for serious illnesses[18,21]. Health education programmes in Ovia North East should be specifically tailored to reach older caregivers, including grandmothers and elderly female relatives who often assume caregiving responsibilities in extended family households, using culturally appropriate communication channels such as community meetings convened by traditional leaders, women's groups organised through churches and mosques, and interpersonal counselling by respected older community health volunteers who can serve as credible messengers and role models for their age-group peers.

Educational level was significantly associated with care-seeking behaviour, with caregivers having formal education demonstrating significantly better care-seeking behaviour compared to those with non-formal education. The probable reason for this association is multi-layered. Formal education enhances health literacy by equipping individuals with reading and numeracy skills that enable them to access and understand written health information including medication labels, dosing instructions, and health education materials distributed in clinics and communities[39]. Educated caregivers are more likely to recognise the signs of severe dehydration and other danger signs that warrant urgent medical attention, whereas those with limited education may not distinguish between mild diarrhoea that can be managed at home and life-threatening illness requiring professional intervention[4,18]. Education also empowers caregivers to interact more confidently with healthcare providers, ask questions, and advocate for their children's needs within the healthcare system, whereas less educated individuals may feel intimidated by medical authority and reluctant to seek care[18]. Furthermore, formal education is often associated with exposure to modern values including trust in science and

biomedicine, whereas individuals with limited schooling may adhere more strongly to traditional beliefs and practices. Socioeconomic pathways also link education to care-seeking, as better-educated individuals typically have higher incomes and greater ability to afford healthcare costs[24], though in this study the association persisted even after accounting for socioeconomic status, suggesting that knowledge and attitudes play an independent role. This is consistent with findings from a community-based analytical cross-sectional study conducted in Dangila Zuria Woreda, Ethiopia, which found that caregivers with primary education had significantly increased odds of seeking care from health facilities for childhood diarrhoea[18]. Similarly, a cross-sectional study conducted in Botswana in 2023 found that higher education levels among caregivers were positively associated with health facility utilisation and appropriate management of childhood diarrhoea[21]. This finding is significant because it reveals that educational disparities translate into health inequities, with children of less educated caregivers facing higher risks of inadequate care and preventable complications from diarrhoeal disease[18,24], thereby perpetuating intergenerational cycles of poor health and limited educational attainment[39]. The Edo State Universal Basic Education Board should collaborate with the Ministry of Health to integrate child health education into adult literacy programmes targeting out-of-school women in Ovia North East, using simplified pictorial materials and participatory learning methods to teach danger sign recognition, oral rehydration therapy, and appropriate care-seeking for childhood illnesses, thereby simultaneously addressing educational gaps and improving child health knowledge among the most vulnerable population segments.

Marital status was significantly associated with care-seeking behaviour, with never-married caregivers demonstrating significantly better care-seeking behaviour compared to ever-married caregivers. The probable reason for this finding is multi-layered and merits careful interpretation. Never-married caregivers in this context may include single mothers, divorced

or separated women who are classified differently, and young mothers who have not yet formalised marital unions. These individuals may have greater autonomy in healthcare decision-making because they are not bound by spousal authority or traditional gender norms that require married women to seek permission from their husbands before taking children to health facilities or spending household resources on medical care[20,22]. Single mothers may also be more likely to reside in nuclear family settings rather than extended family compounds, reducing the influence of elder relatives who might discourage biomedical care in favour of traditional remedies[31]. Additionally, never-married mothers may face greater social scrutiny regarding their parenting competence and may therefore be more motivated to demonstrate responsible caregiving by seeking timely professional care for their children[19]. However, it is also possible that never-married caregivers face greater economic precarity and have greater familiarity with public health services and social support programmes that are often targeted at vulnerable households, thereby increasing their exposure to health education and encouraging healthcare utilisation[21]. The small sample size of never-married caregivers in this study limits the precision of this estimate and suggests that this finding should be interpreted cautiously and explored further in future research. This is consistent with findings from a descriptive cross-sectional study conducted in Ibadan North Local Government Area, Oyo State, Nigeria, which found that marital status influenced health-seeking behaviour and home management practices for childhood diarrhoea[20]. Similarly, a community-based cross-sectional study conducted in Masindi District, Uganda, found that caregiver characteristics including marital status and decision-making autonomy influenced care-seeking behaviour for common childhood illnesses[22]. This finding is significant because it suggests that household power dynamics and gender norms surrounding decision-making authority and financial control affect caregivers' ability to act promptly when their children are ill, with potential consequences for health outcomes if delays occur while permissions are sought or resources are negotiated[20,22].

Community-based organisations working on gender equality and women's empowerment in Ovia North East should integrate health advocacy and decision-making skills into their programmes, creating safe spaces for married women to discuss challenges they face in accessing healthcare for their children and providing practical strategies for negotiating with spouses and elder family members, while simultaneously engaging men through male peer education and father-focused health promotion initiatives to encourage shared parental responsibility for child health.

Family type was significantly associated with care-seeking behaviour, with caregivers from nuclear families demonstrating significantly better care-seeking behaviour compared to those from extended families. The probable reason for this association is multi-layered. Nuclear families typically have fewer decision-makers involved in child health matters, enabling caregivers to act more quickly and independently when their children are ill, whereas in extended family households, multiple relatives including grandmothers, mothers-in-law, and senior male relatives may exert influence over healthcare decisions, potentially introducing delays while consensus is sought or disagreements are resolved[32]. Nuclear families may also have clearer financial arrangements and greater control over household resources, allowing mothers to allocate money for healthcare without extensive consultation or justification, whereas in extended families, financial resources are often pooled and expenditure decisions require approval from senior household members who may prioritise other needs or believe that diarrhoea can be managed at home without professional care. Additionally, nuclear families are more likely to adopt modern child-rearing practices and healthcare-seeking norms, whereas extended families may adhere more strongly to traditional practices and home remedies that have been passed down through generations. The influence of elder relatives, particularly grandmothers who may have managed childhood illnesses using traditional methods during their own child-rearing years, can discourage young mothers from seeking

biomedical care and instead encourage reliance on herbal preparations and spiritual remedies. Nuclear families may also reside in more urbanised areas with better access to health facilities, whereas extended families are more common in rural settings where geographic and transportation barriers compound the decision-making challenges. This is consistent with findings from a community-based analytical cross-sectional study conducted in Ginchi town, Oromia region, West Ethiopia, which found that household structure and family decision-making patterns influenced home-based diarrhoea management practices[23]. Similarly, a descriptive cross-sectional study conducted in Egor Local Government Area, Edo State, Nigeria, found that family structure and household composition influenced maternal practices regarding home management of childhood diarrhoea[31]. This finding is significant because it reveals that family structure shapes not only living arrangements but also health behaviours and outcomes, with children in extended family households potentially facing greater barriers to timely professional care despite the theoretical advantages of having more caregivers and resources available within the household[34]. Health workers conducting home visits in Ovia North East should recognise the influence of extended family structures on healthcare decision-making and should engage multiple household members including grandmothers, fathers, and senior relatives in health education sessions, using respectful communication that acknowledges the value of intergenerational experience while gently introducing evidence-based practices and emphasising the importance of prompt professional care for danger signs, thereby building consensus within households rather than creating conflict between traditional and biomedical approaches.

Monthly household income was significantly associated with care-seeking behaviour, with those earning one hundred fifty thousand naira or more demonstrating the highest proportion of good care-seeking behaviour, followed by those earning seventy thousand to one hundred forty-nine thousand naira, and those earning less than seventy thousand naira. The probable

reason for this income gradient is multifactorial. Healthcare costs including consultation fees, transportation to health facilities, diagnostic tests, and medications represent a significant financial burden for low-income households, and caregivers facing resource constraints may delay seeking care in the hope that the illness will resolve spontaneously, or may attempt home management using cheaper traditional remedies or over-the-counter drugs purchased from patent medicine vendors[33]. Higher-income households have greater financial flexibility and are more willing to incur healthcare expenditures without fear of catastrophic consequences for other essential needs such as food, housing, and school fees. Wealthier families are also more likely to own private transportation or have access to taxi services, reducing the logistical and financial barriers to reaching health facilities, whereas poor families may depend on unreliable public transport or walking long distances, which can be prohibitive particularly during emergencies or adverse weather conditions[25]. Additionally, income is correlated with education, occupation, and social status, and higher-income caregivers may have greater exposure to health information, stronger social networks that provide health advice, and greater confidence in interacting with healthcare providers. Financial constraints may also lead to seeking care from less qualified providers such as patent medicine vendors or traditional healers who charge lower fees but may provide inappropriate or ineffective treatments. This is consistent with findings from a descriptive cross-sectional study conducted in Maun, Botswana, which found that lower-income households were less likely to demonstrate appropriate health-seeking behaviour for childhood diarrhoea[19]. Similarly, an analytical cross-sectional secondary analysis of Nepal Demographic and Health Surveys found that socioeconomic factors including household wealth were associated with better diarrhoea management practices and use of oral rehydration solution[24]. This finding is significant because it highlights the role of economic barriers in perpetuating health inequities, with children from poor families facing higher risks of inadequate care and preventable complications from

diarrhoeal disease despite living in the same geographic area and having access to the same health facilities as wealthier families[35]. The Edo State Health Insurance Scheme should expand coverage to include informal sector workers and low-income households in Ovia North East, offering subsidised or free enrolment for families below a defined income threshold, ensuring that insured members can access maternal and child health services including diarrhoea treatment at designated primary health centres without out-of-pocket payments, and conducting community mobilisation to raise awareness about the scheme and facilitate enrolment processes through partnerships with local government authorities and community-based organisations.

Household size was significantly associated with care-seeking behaviour, with caregivers from households having fewer than six persons demonstrating significantly better care-seeking behaviour compared to those from households with six or more persons. The probable reason for this finding is multi-layered. Larger households often face greater resource constraints because family income must be stretched to meet the needs of more members, leaving less money available for healthcare expenditures including transportation, consultation fees, and medications for any single child. Caregivers in large households may also experience competing demands on their time and attention, as they must balance the care of multiple children and other dependents with household chores, income-generating activities, and social obligations, potentially leading to delays in recognising illness severity or mobilising to seek care. Large households are also more likely to be extended families with complex decision-making structures involving multiple adults, which can slow the care-seeking process as discussed earlier. Additionally, in households with many children, caregivers may develop a sense of routine familiarity with childhood illnesses including diarrhoea, leading to complacency and a tendency to manage subsequent episodes at home without seeking professional advice. Overcrowding in large households may also increase the transmission of

infectious diseases including diarrhoea, resulting in multiple simultaneous cases that overwhelm caregivers' capacity to provide individualised attention and seek care for each affected child. This is consistent with findings from a systematic review and meta-analysis of studies conducted in Ethiopia, which found that household size and number of children were associated with diarrhoea prevalence and management practices[17]. Similarly, a community-based cross-sectional study conducted in Masindi District, Uganda, found that household composition and number of dependents influenced caregiver health-seeking behaviour for common childhood illnesses[22]. This finding is significant because it reveals that household structure and size shape resource availability and caregiving capacity, with children in large households potentially facing disadvantages in access to healthcare despite being part of larger family networks that might theoretically provide more support[36]. Family planning services in Ovia North East should be strengthened and made more accessible through community-based distribution of contraceptives by trained health workers, integration of family planning counselling into child health visits and immunisation clinics to reach mothers with multiple young children, and community mobilisation campaigns that address cultural and religious misconceptions about contraception while emphasising the health and economic benefits of child spacing for maternal and child wellbeing.

After adjusting for other variables in multivariate logistic regression analysis, family type remained a significant predictor of care-seeking behaviour, with caregivers from extended families having significantly lower odds of good care-seeking behaviour compared to those from nuclear families. This means that holding constant other factors such as age, education, income, and household size, caregivers in extended families were approximately half as likely to demonstrate good care-seeking behaviour as those in nuclear families. The probable reason for this persistent association is multi-layered. Even after accounting for socioeconomic status and other confounders, extended family structure imposes constraints on individual autonomy

and rapid decision-making that are not fully captured by measurable variables such as income or education. The cultural dynamics of intergenerational authority, gender hierarchy, and collective decision-making in extended families represent deep-rooted social norms that shape health behaviours independently of material resources or formal knowledge[28]. Extended families may also operate under different paradigms of child-rearing and illness management that prioritise self-reliance, traditional remedies, and avoidance of external healthcare systems except as a last resort, reflecting not ignorance or lack of resources but rather coherent alternative belief systems about health, illness, and appropriate care. Additionally, the time and logistical costs of seeking care may be higher in extended families because caregivers must coordinate with multiple household members, arrange child care for other children, and navigate complex scheduling and resource allocation processes, creating friction that discourages healthcare utilisation even when resources are theoretically available[36]. This is consistent with findings from a community-based analytical cross-sectional study conducted in Ginchi town, Ethiopia, which found that family structure influenced home-based diarrhoea management practices even after adjusting for maternal education and household income[23]. Similarly, a community-based cross-sectional study conducted in Ethiopia found that household decision-making patterns and family type were independent predictors of knowledge and practice regarding home management of diarrhoea[32]. This finding is significant because it demonstrates that family structure exerts an independent influence on health behaviours beyond its correlation with socioeconomic factors, suggesting that interventions aimed at improving care-seeking must address not only material barriers but also social and cultural dimensions of household decision-making and intergenerational relationships[37]. Community health education programmes in Ovia North East should be redesigned by the Edo State Primary Health Care Development Agency in collaboration with the Ministry of Health to adopt family-centred approaches that bring together multiple generations of caregivers

including mothers, grandmothers, fathers, and other influential household members for joint learning sessions on child health, using participatory methods such as role-plays and case discussions to explore realistic scenarios where quick care-seeking decisions must be made, and facilitating dialogue about balancing respect for traditional knowledge with recognition of when professional medical care is necessary.

This study found that utilisation of recommended diarrhoea management options was extremely poor, with only about one-quarter of caregivers giving oral rehydration solution during diarrhoeal episodes, and an even smaller proportion giving zinc tablets or syrup. Regarding feeding practices, more than half of caregivers maintained the same breastfeeding or feeding pattern during diarrhoea, while smaller proportions reduced feeding, stopped feeding, increased feeding, or had children who were not breastfed. For liquid intake, more than one-third gave less fluid, over one-third maintained the same amount, one-fifth gave more, and a small minority stopped giving liquids. Regarding food intake, more than half reduced food intake, one-quarter maintained the same amount, about one in ten stopped food intake, and a small minority increased food intake. Overall, good feeding practices were observed in nearly half of caregivers, while poor feeding practices predominated in slightly more than half. The probable reason for these suboptimal practices is multi-layered. The low utilisation of oral rehydration solution despite its life-saving potential may reflect limited availability of ORS sachets at the household level[48], as caregivers may not routinely stock these supplies and may face challenges accessing them from pharmacies or health facilities particularly in rural communities or outside regular business hours. Financial barriers also play a role, as even the modest cost of ORS sachets may be prohibitive for poor families, though free distribution programmes exist but may not reach all communities[4]. Additionally, many caregivers lack knowledge about the correct preparation and administration of ORS, including the appropriate timing, quantity, and frequency of administration, and may fear that giving too much fluid will

worsen the diarrhoea rather than prevent dehydration. The misconception that fluid restriction is beneficial during diarrhoea persists in many communities and is sometimes reinforced by traditional beliefs or advice from elder relatives. Zinc supplementation faces even greater barriers including extremely low awareness of its benefits, lack of availability in many communities, higher cost compared to ORS, and absence of strong promotion by healthcare providers and community health workers. The feeding practices observed in this study reflect a mix of appropriate and inappropriate behaviours. Maintaining the same feeding pattern during diarrhoea is generally appropriate and aligns with WHO recommendations[48], though increasing food and fluid intake is ideal to compensate for losses and support recovery. However, the substantial proportion of caregivers who reduced or stopped feeding reflects persistent misconceptions that resting the digestive system helps resolve diarrhoea, a belief that contradicts evidence showing that continued feeding maintains nutritional status and promotes mucosal recovery. Similarly, reducing liquid intake is harmful and increases the risk of dehydration, yet more than one-third of caregivers practiced this, possibly due to fear of worsening diarrhoea or lack of understanding of the importance of fluid replacement. This is consistent with findings from a community-based analytical cross-sectional study conducted in Ginchi town, Ethiopia, which found that only about three-fifths of caregivers had good home-based diarrhoea management practices, with oral rehydration solution use at about three-quarters but zinc supplementation extremely low at about one-fifth[23]. A comparable pattern was observed in a community-based descriptive cross-sectional survey conducted in Ikorodu Local Government Area, Lagos State, Nigeria, which found that while the vast majority of caregivers were aware of ORS, only a small minority correctly used ORS and zinc together, and about two-thirds administered unnecessary medications such as antibiotics and antidiarrheals[27]. This finding has important public health implications because suboptimal use of oral rehydration solution and zinc contributes to preventable morbidity and mortality from dehydration and

prolonged diarrhoea, while inappropriate feeding practices can compromise nutritional status and delay recovery, and unnecessary use of antibiotics promotes antimicrobial resistance and exposes children to medication side effects without therapeutic benefit[38]. The Edo State Primary Health Care Development Agency should implement a comprehensive community-based diarrhoea management programme in Ovia North East that includes free distribution of pre-packaged ORS and zinc through community health workers during house-to-house visits and community outreach events, training of caregivers on correct preparation and administration of ORS including practical demonstrations using locally available containers for measuring water and mixing solution, and mass media campaigns using radio spots and community theatre to address misconceptions about feeding during diarrhoea and promote the message that continued feeding and increased fluids are essential for recovery.

This study found that several factors were significantly associated with household management of childhood diarrhoea in bivariate analysis. Treatment satisfaction was significantly associated with family type, monthly income, household size, and spouse occupation skill level. Family type showed that caregivers from nuclear families had significantly higher treatment satisfaction compared to those from extended families. Monthly income demonstrated a significant association, with caregivers earning one hundred fifty thousand naira or more reporting the highest treatment satisfaction. Household size was significantly associated with treatment satisfaction, with households having fewer than six members reporting higher satisfaction compared to those with six or more members. Spouse occupation skill level was significantly associated with treatment satisfaction, with those whose spouses were in occupation categories other than skill level two reporting higher satisfaction. Additionally, factors associated with care-seeking behaviour included caregiver age group, education level, marital status, family type, monthly income, household size, number of children, caregiver occupation, spouse occupation, number of under-five children, relationship to child, and

proportion of diarrhoea. The probable reason for these associations is multi-layered and reflects the complex interplay of socioeconomic, cultural, and health system factors that shape household management of childhood diarrhoea. Higher income and smaller household size enable families to access better quality healthcare services, spend more time per child, and afford follow-up visits and medications, leading to better treatment outcomes and higher satisfaction[25]. Nuclear family structures facilitate rapid decision-making and resource allocation for healthcare without the competing demands and complex negotiations characteristic of extended families[39]. Higher spouse occupation skill level may proxy for household wealth, social status, and access to employer-sponsored health insurance or other benefits that improve healthcare access and quality[43]. The associations with caregiver education, age, and marital status reflect differences in health literacy, autonomy, and exposure to health information across demographic groups. This is consistent with findings from an analytical cross-sectional study conducted in Ethiopia, which found that maternal education, household income, and family type were significant predictors of home-based diarrhoea management practices[32]. Similarly, a community-based cross-sectional study conducted in Doba Woreda, Ethiopia, found that socioeconomic status, household structure, and caregiver characteristics were associated with poor home management practices for childhood diarrhoea[33]. This finding is significant because it reveals that household management of childhood diarrhoea is shaped by multiple intersecting factors operating at individual, household, and community levels, and interventions must therefore adopt multi-level approaches that address not only caregiver knowledge and attitudes but also structural determinants including poverty, family organisation, and health system accessibility[39]. Edo State Ministry of Health with the Edo State Primary Health Care Development Agency alongside Ovia North East Local Government Health Authority should adopt a social determinants of health framework in designing interventions for childhood diarrhoea,

integrating health sector initiatives such as community case management and health education with broader development programmes addressing poverty alleviation, women's economic empowerment, improvement of water and sanitation infrastructure, and expansion of social protection schemes, recognising that sustainable reductions in diarrhoea burden require comprehensive approaches that address the root causes of vulnerability rather than relying solely on health education and clinical services.

CONTRIBUTION TO KNOWLEDGE

This study makes several important contributions to knowledge regarding household management of childhood diarrhoea in Nigeria and sub-Saharan Africa. First, it provides contemporary local data from Ovia North East Local Government Area, a semi-urban setting that has been under-researched compared to major cities and remote rural areas, thereby filling an important gap in the evidence base and enabling context-specific programming. Second, the study documents the persistence of suboptimal care-seeking and home management practices despite relatively high levels of formal education and middle-class socioeconomic status among respondents, challenging assumptions that poverty and illiteracy are the sole or primary drivers of poor practices and highlighting the importance of cultural beliefs, family dynamics, and health system factors in shaping behaviours. Third, the finding that extended family structure independently predicts poor care-seeking behaviour even after adjusting for confounders adds to the limited literature on how household organisation and decision-making authority influence child health outcomes, with implications for intervention design. Fourth, the study reveals specific age-related patterns in diarrhoea prevalence and care-seeking, with older toddlers having higher disease burden and younger caregivers demonstrating better health-seeking behaviours, findings that can inform targeted age-appropriate interventions. Fifth, the extremely low utilisation of zinc supplementation documented in this study, even

lower than rates observed in many other Nigerian and African studies, signals an urgent need for policy attention and programme strengthening to address this missed opportunity for reducing diarrhoea duration and severity. Sixth, the study contributes methodologically by using standardised WHO and UNICEF measurement tools adapted to the local context, ensuring comparability with international studies while capturing locally relevant practices. Finally, by examining multiple dimensions of household management including proportion of disease, care-seeking, treatment options, feeding practices, and associated factors within a single study population, this research provides a holistic understanding of the childhood diarrhoea management landscape in Ovia North East, enabling comprehensive and integrated intervention planning.

POLICY IMPLICATION OF STUDY FINDINGS

The findings of this study have several important policy implications for childhood diarrhoea control in Edo State and Nigeria more broadly. First, the high prevalence of diarrhoea despite relatively advantaged socioeconomic conditions in the study population indicates that environmental and structural determinants including unsafe water, inadequate sanitation, and poor hygiene infrastructure must be addressed through large-scale Water, Sanitation, and Hygiene investments as a priority intervention, requiring increased budgetary allocation, inter-sectoral coordination between health, water, and local government sectors, and mobilisation of development partners and private sector resources. Second, the finding that more than two-thirds of caregivers demonstrated poor care-seeking behaviour despite high education levels reveals that health literacy and knowledge alone are insufficient to drive behaviour change, and programmes must address barriers including financial costs, geographic accessibility, perceived quality of care, and cultural norms through comprehensive health systems strengthening including expansion of health insurance coverage, upgrading of primary health

centres, training and deployment of community health workers for household-level case detection and triage, and quality improvement initiatives to enhance patient satisfaction and trust in health services. Third, the extremely low utilisation of zinc supplementation documented in this study signals a policy failure in the implementation of national guidelines for integrated management of childhood illness, requiring urgent action to ensure zinc availability through supply chain management interventions, creation of demand through social marketing and community mobilisation, and strengthening of provider knowledge and prescription practices through in-service training and supportive supervision. Fourth, the influence of extended family structures on care-seeking behaviour and management practices suggests that community health education programmes must be redesigned to adopt family-centred approaches that engage multiple generations of caregivers and address intergenerational knowledge transfer and decision-making dynamics, moving beyond individual mother-focused interventions to household and community-level strategies. Fifth, the identification of specific vulnerable sub-populations including non-Edo migrants, caregivers with low education, large households, and extended families creates opportunities for targeted interventions that prioritise equity and reach those most at risk of poor outcomes, aligning with Nigeria's commitment to universal health coverage and the principle of leaving no one behind. Sixth, the poor feeding practices documented in this study, including widespread reduction of food and fluid intake during diarrhoeal episodes, indicate that misconceptions about diarrhoea management persist and require sustained behaviour change communication using mass media, interpersonal counselling, and community engagement strategies that address deep-rooted cultural beliefs and practices. Finally, the findings underscore the need for integrated multi-sectoral approaches that combine health service delivery improvements, community-based interventions, infrastructure development, social protection, and women's empowerment, recognising that childhood diarrhoea is fundamentally

a problem of poverty, inequality, and inadequate social determinants rather than solely a medical or technical challenge. Policymakers should therefore ensure that childhood diarrhoea features prominently in state and local government development plans, with dedicated budget lines, monitoring frameworks, and accountability mechanisms to drive sustained progress toward the sustainable development goal targets for child mortality and universal health coverage.

CONCLUSION

In relation to the proportion of diarrhoeal disease among under-five children, this study found that almost half of the children had experienced diarrhoea within the two weeks preceding the survey, indicating that childhood diarrhoea remains a major public health problem in Ovia North East Local Government Area. More than half of the caregivers correctly defined diarrhoea, and a little above half were able to identify danger signs of dehydration. Ethnicity was significantly associated with the occurrence of diarrhoea among under-five children.

In relation to care-seeking behaviour, the study showed that care-seeking was suboptimal among caregivers, with family structure playing an important role. Extended family type was significantly associated with poorer care-seeking behaviour, and it remained a significant predictor after multivariate analysis, with caregivers from extended families being less likely to demonstrate good care-seeking behaviour compared with those from nuclear families. Household size, caregiver age, education, marital status, income, occupation, and number of children were also significantly associated with care-seeking behaviour.

In relation to the treatment options utilized for childhood diarrhoea, the study found that the use of recommended diarrhoea management options was poor. Only about one-quarter of caregivers used oral rehydration solution, while an even smaller proportion used zinc during diarrhoeal episodes. The findings also showed that inappropriate home practices were still common, suggesting a persistent gap between knowledge and proper practice in household management of childhood diarrhoea.

In relation to feeding practices, more than half of the caregivers maintained the same breastfeeding or feeding pattern during diarrhoea, while a considerable proportion reduced food and fluid intake. Overall, poor feeding practice slightly predominated over good feeding practice, with more than half of caregivers demonstrating poor feeding practices during

diarrhoeal episodes. This implies that many caregivers still do not follow recommended feeding and hydration practices needed to prevent dehydration and malnutrition.

In relation to factors associated with household management of childhood diarrhoea, family type, monthly income, household size, and spouse occupation skill level were significantly associated with treatment satisfaction. More broadly, the study showed that household management of childhood diarrhoea was influenced by a combination of socio-demographic and household factors, highlighting the importance of addressing not only caregiver knowledge but also structural and family-level determinants.

RECOMMENDATIONS

The following recommendations were made based on the findings from this study, with the hope that if implemented, they will improve household management of childhood diarrhoea among caregivers and reduce morbidity and complications among under-five children in Ovia North-East Local Government Area.

TO THE GOVERNMENT (FEDERAL MoH, STATE MoH, OVIA NORTH EAST LGA)

1. The Federal Ministry of Health, Edo State Ministry of Health, and Ovia North-East Local Government Authority should strengthen policies that ensure full integration of evidence-based childhood diarrhoea management protocols, particularly the routine use of Oral Rehydration Solution (ORS) and zinc supplementation, into all Primary Health Care (PHC) services, child welfare clinics, and immunisation programmes.

2. Adequate funding should be allocated to sustained community-based health education campaigns using accessible platforms local radio stations, churches, mosques, markets, schools, and town union meetings to educate caregivers on the recognition of diarrhoea, danger signs of dehydration, and appropriate home management practices.

3. The government should ensure the continuous availability, accessibility and affordability of ORS and zinc at all levels of care, especially in primary health centres while strengthening supply chains and subsidising costs in rural and low-income communities where access is limited.

4. Multi-sectoral collaboration should be strengthened between the Ministry of Health and relevant stakeholders to promote Water, Sanitation, and Hygiene (WASH) interventions, including access to safe drinking water and proper sanitation facilities through construction and maintenance of boreholes, provision of public toilets,

drainage clearing, and enforcement of environmental sanitation laws against open defecation.

5. The government should support research initiatives and surveillance systems through monthly reporting of childhood diarrhoea cases from PHCs and private facilities aimed at identifying barriers to appropriate diarrhoea management and evaluating the effectiveness of intervention programs.

TO HEALTHCARE INSTITUTIONS (PHCs/UBTH/LOCAL HEALTH FACILITIES)

1. Health facilities should provide consistent health education for caregivers on proper home management of diarrhoea including ORS preparation, zinc use, increased fluids, continued feeding, and danger signs requiring urgent referral during clinic visits, especially during antenatal clinics, immunization and child welfare clinics.

2. Health workers should be trained and retrained regularly on updated WHO and national guidelines for diarrhoea management, with emphasis on caregiver counselling on ORS preparation, zinc use, and continued feeding practices with emphasis on caregiver counselling and rational antibiotic use.

3. Primary health centres should ensure uninterrupted availability of essential commodities such as ORS and zinc and improve their distribution at the community level.

4. Healthcare providers should actively engage caregivers through demonstrations and practical sessions on correct home management practices to bridge the knowledge–practice gap.

5. Community outreach services should be strengthened through home visits, mobile clinics, and health talks in hard-to-reach communities to improve early care-seeking behaviour and to educate caregivers on when to seek professional healthcare services.

TO THE COMMUNITY/CAREGIVERS

1. Caregivers should be encouraged through community leaders, women groups, and religious organisations to correctly identify diarrhoea and recognize early danger signs of dehydration to enable prompt and appropriate action.
2. Caregivers should consistently use recommended home management practices, including the use of ORS, zinc supplementation, increased fluid intake, and continued feeding during diarrhoeal episodes.
3. Caregivers should avoid inappropriate practices such as self-medication, especially the use of antibiotics without medical prescription, stopping food or fluids, or relying only on herbal mixtures and unverified remedies.
4. Caregivers should seek timely care from qualified health facilities when symptoms persist or worsen rather than relying solely on home remedies or informal care sources.
5. Community members should adopt proper hygiene practices, including regular environmental sanitation activities, maintain clean surroundings, regular handwashing, and safe water handling, to prevent the occurrence and spread of diarrhoeal diseases.

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APPENDIX

INFORMED CONSENT FORM

TITLE OF STUDY

Household Management of Childhood Diarrhea in Ovia North East Local Government

INSTITUTION

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

PRINCIPAL INVESTIGATORS

Egharevba Osarumen Mary

Ayo-Yinusa Tosin

SUPERVISOR

Prof. Vincent Adam

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 Household Management of Childhood Diarrhea in Ovia North East Local Government in Benin City.

PROCEDURES

You are kindly requested to complete a questionnaire designed to assess the Household Management of childhood diarrhea in Ovia North East local government in Benin City. This questionnaire is for research purposes only.

CONFIDENTIALITY

All information collected would be kept confidential and stored securely. Data collected would he 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 inform us on household practices in managing childhood diarrhoea, identify gaps in knowledge and care, and guide interventions that improve child health outcomes, empower caregivers, and strengthen community-based health strategies.

CONTACT INFORMATION

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

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Ethics and Research Committee,

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Benin City.

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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

DEPARTMENT OF COMMUNITY HEALTH, UNIVERSITY OF BENIN, BENIN CITY

HOUSEHOLD MANAGEMENT OF CHILDHOOD DIARRHOEA IN OVIA NORTH-EAST LOCAL GOVERNMENT AREA

Dear Respondents,

I am a final year medical student of the University of Benin, Benin City conducting a research project on the household management of childhood diarrhoea in Ovia North East, Benin City with a view to making recommendations that will improve health care.

Please answer all questions as accurately as possible, as all information given will be treated with utmost confidentiality. Thank you.

SECTION A: SOCIODEMOGRAPHIC CHARACTERISTICS

COMMUNITY:

1. **Age of caregiver (in years):** _____

2. **Sex of caregiver**: [ ]Male [ ] Female

3. **Ethnic group**: [ ]Benin [ ]Esan [ ]Uhrobo [ ]Ijaw [ ]Yoruba [ ]Igbo [ ]Hausa [ ]Ika [ ]Afemai [ ]Others;please specify _____

4. **Highest level of education:** [ ]No formal education [ ]Primary [ ]Secondary [ ]Tertiary

5. **Marital status:** [ ]Single [ ]Married [ ]Co-habiting [ ]Divorced/Separated [ ]Widowed

6. **Marriage type**: [ ]Monogamous [ ] Polygamous

7. **Family type:** [ ]Nuclear [ ]Extended

8. **Occupation of caregiver:** _____

9. **Occupation of spouse:** _____

10. **Religion:** [ ]Christianity [ ]Islam [ ]African Traditional Religion

11. **Household size{ number of persons in the family}:** _____

12. **Household income per month (approx.):** _____

13. **Who supports the family financially?** _____

14. **Number of children in the family:** _____

15. **Number of under-five children:** _____

16. **Age of selected child (0–59 months):** _____

17. **Sex of selected child** [ ]Male [ ]Female

18. **What is your relationship to the child/children?** [ ]Mother [ ]Father [ ]Aunty [ ]Grandmother [ ] Others, please Specify _____

SECTION B: PROPORTION OF CHILDREN UNDER 5 WITH DIARRHOEA

19. What do you understand by the term "**diarrhoea**" : [ ]Passage of **three or more loose or watery stools in 24 hours** [ ]Passage of **one watery stool in a day** [ ]Passage of **formed stools more than three times daily** [ ]Passage of **any stool after meals**.

20. **Has your child had diarrhoea in the last 2 weeks? (Three or more loose stools within 24 hours)** [ ]Yes [ ]No **(if no skip to number 23)**

21. **In the last 24hours of this recent episode, how many times did the child pass loose stool?** [ ]once [ ]twice [ ]≥three

22. **Was there blood during that episode?** [ ]Yes [ ]No

23. **Do you know the danger signs of dehydration?** [ ]Yes [ ]No

24**. If yes, what are they? (Tick all that apply)** [ ]Sunken eyes [ ]Very thirsty [ ]Lethargy [ ]Dry mouth [ ]Crying always [ ]sleeping too much

25. **How many diarrhoeal episodes has the child had in the past 6 months?** [ ]None [ ]1 [ ]2 [ ]3 or more

SECTION C: OPTIONS UTILIZED AND FEEDING PRACTICES DURING DIARRHOEA

26. **Have you heard of ORS?** [ ]Yes [ ]No

27. **If yes above, how did you hear about ORS**? **{TICK ALL THAT APPLY}** [ ]Clinic/Hospital [ ] Television [ ] Radio [ ]Friends [ ]Family [ ] Other, please Specify

28. **Do you know what ORS is used for?** [ ]Yes [ ] No **If no move to Q.30**

29. **ORS in diarrhoea management:** [ ]Makes child more intelligent [ ] Helps to replace lost fluid [ ] Cures diarrhoea [ ] Prevents dehydration [ ] Don't know

30. **During diarrhoea episode did you give your child ORS (Oral Rehydration Salts) solution?** [ ]Yes [ ]No

31. **Is home-made ORS same as ORS packets?** [ ]Yes [ ] No [ ] Don't Know

32. **Did you give your child home prepared fluid like Sugar Salt Solution (SSS)?** [ ]Yes [ ]No **If no move to Q.34**

33. **If yes above, how do you prepare it?** [ ]3 teaspoons sugar + 1 teaspoon of salt in 500mls of water [ ]6 teaspoons sugar + 1/2 teaspoon salt in 1 litre water [ ]4 teaspoons sugar + 1 teaspoon salt in 1 litre water [ ]Do not know

34. **What type of water do you use to prepare the Sugar Salt Solution?** [ ]Boiled water [ ]Bottled water [ ]Dirty water [ ]Any clean water [ ]Pure water

35. **How do you give the ORS to your child?** [ ]Cup & spoon [ ] Only cup [ ] Feeding bottle [ ] Other, please specify.....

36. **How long do you keep the prepared ORS?** [ ]24 hours [ ]48 hours [ ]6 hours [ ]72 hours [ ]Don't know

37. **Have you heard of Zinc supplementation tablets or syrup?** [ ]Yes [ ]No

38. **Did you give zinc tablets or syrup ?** [ ]Yes [ ]No

39. **Did you give your child locally prepared liquid like rice water, coconut water, kunu, plain water?** [ ]Yes [ ]No

40. **Did you give your child any antibiotics?** [ ]Yes [ ]No

41. **Did you give your child any herbal or traditional medicine?** [ ]Yes [ ]No

42. **Did you give any other pills or injections?** [ ]Yes [ ]No

43. **Do you breastfeed/feed more, same, or less during diarrhoea?** [ ]More [ ]Same [ ]Less [ ]Stopped [ ]Child not breastfed

44. **During the diarrhoea episode, what was the liquid intake?** [ ]More [ ]Same [ ]Less [ ]Stopped

45. **During the diarrhoea episode, what was the food intake?** [ ]More [ ]Same [ ]Less [ ]Stopped

46. **Did you monitor signs of dehydration?** [ ]Yes [ ]No

SECTION D: FACTORS ASSOCIATED WITH DIARRHEA MANAGEMENT

47. **Did you receive any prior information on diarrhoea management**? [ ] Yes [ ] No **if no move to 49**

48. **Source of information (Tick all that apply):**

[ ]Health worker [ ]Radio [ ]TV [ ]Family [ ]Friends [ ]Church [ ]Other _____

49. **Main source of drinking water?** [ ]Borehole [ ]Tap water [ ]River/Stream [ ]Sachet water [ ]Well water

50. **Do you treat your water before drinking?** [ ]Yes [ ]No **if no, move to 52**

51. **If yes, how:** [ ]Boiling [ ]Filtration [ ]Chlorination [ ]Other please specify _____

52. **Where do household members (including children) defecate?**

[ ]Water Closet [ ]Pit latrine [ ]Open defecation

53. **When do you usually wash your hands? (Tick all that apply)**

[ ]Before preparing food [ ]Before feeding a child {[ ]After using the toilet [ ]After cleaning a child's stool [ ]Before eating [ ]After working/dirty tasks

54. **Are there any cultural or traditional beliefs that influence diarrhoea management in your household**? [ ] Yes [ ] No **if no, move to 56**

55. **If yes,** [ ]Teething causes diarrhea [ ]Diarrhea cleanses the body [ ]Drinking coconut water cures diarrhea [ ]Please specify: _____

SECTION E: CARE-SEEKING BEHAVIOUR OF CAREGIVERS

56. **Did you seek advice or treatment outside the home for the diarrhoea?** [ ]Yes [ ]No **If no move to Q.58**

57. **If yes, where did you first seek care?** [ ]Government hospital [ ]Health centre [ ]Private clinic [ ]Pharmacy [ ]Community health worker [ ]Traditional healer [ ]Church [ ]Relative/Friend [ ]Others (specify) _____

58. **What was the reason you chose this place?** [ ]Cheap [ ]Close distance [ ]Trust in care provider [ ]Quick service [ ]Availability of drugs [ ]Previous good experience [ ]Others please specify; _____

59. **How soon after the diarrhea started did you seek care?** [ ]Same day [ ]After 1 day [ ]After 2 days [ ] 3 days or more

60. **Who decided to seek care? (Tick all that apply)** [ ]Mother [ ]Father [ ]Both parents [ ]Grandparent [ ]Other please specify _____

61. **What type of treatment was given at the place where you sought care?** [ ]ORS [ ]zinc tablets/syrup [ ]Antibiotics [ ]Herbal medicine [ ]IV fluids [ ]Others; please specify

62. **Were you satisfied with the treatment your child received?** [ ] Yes [ ]No

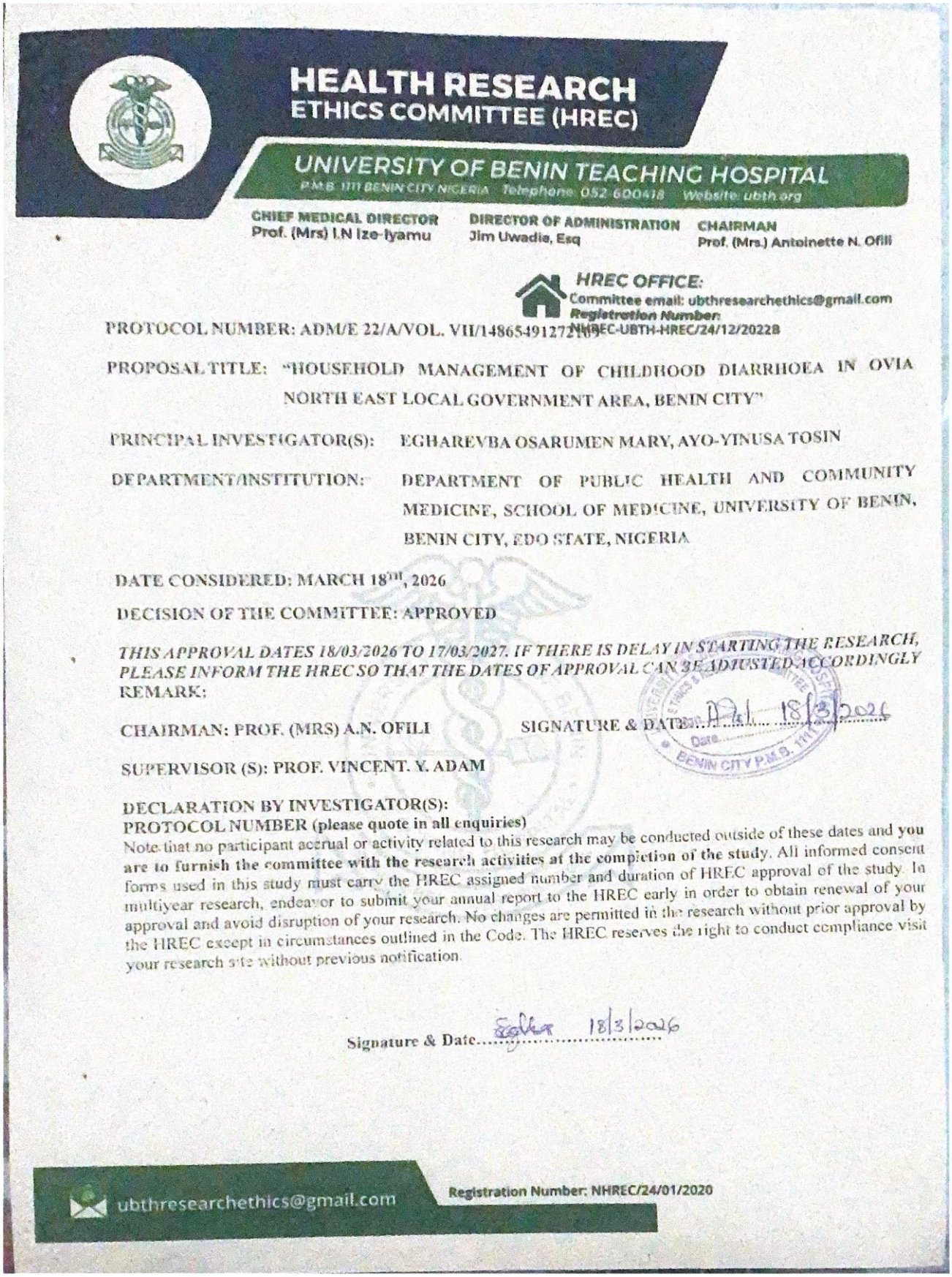
63. **How long does it take you to travel from your home to the nearest Primary Healthcare Centre (PHC)?** [ ]<15 minutes [ ]15-30 minutes [ ]30-60 minutes [ ]>60 mins

64. **If the child needs hospitalization, who usually pays for the treatment?** [ ]Caregiver [ ]Spouse/Partner [ ]Government [ ] Extended Family [ ]Other please Specify _____

65. **If you did not seek care immediately, what was the reason?** [ ] Thought it would stop on its own [ ] Lack of money [ ]Long distance to health facility [ ]Lack of transport [ ]Used home remedy first [ ]Cultural or family beliefs [ ]Others please specify_____

THANK YOU FOR YOUR COOPERATION

APPENDIX III (ETHICAL CLEARANCE)



HEALTH RESEARCH
ETHICS COMMITTEE (HREC)

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CHIEF MEDICAL DIRECTOR
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Committee email: ubthresearchethics@gmail.com
Registration Number:
NHREC-UBTH-HREC/24/12/20228

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486549127209

PROPOSAL TITLE: "HOUSEHOLD MANAGEMENT OF CHILDHOOD DIARRHOEA IN OVIA NORTH EAST LOCAL GOVERNMENT AREA, BENIN CITY"

PRINCIPAL INVESTIGATOR(S): EGHAREVBA OSARUMEN MARY, AYO-YINUSA TOSIN

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

DATE CONSIDERED: MARCH 18TH, 2026

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 18/03/2026 TO 17/03/2027. 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: 18/3/2026

SUPERVISOR (S): PROF. VINCENT. Y. ADAM

DECLARATION BY INVESTIGATOR(S):

PROTOCOL NUMBER (please quote in all enquiries)

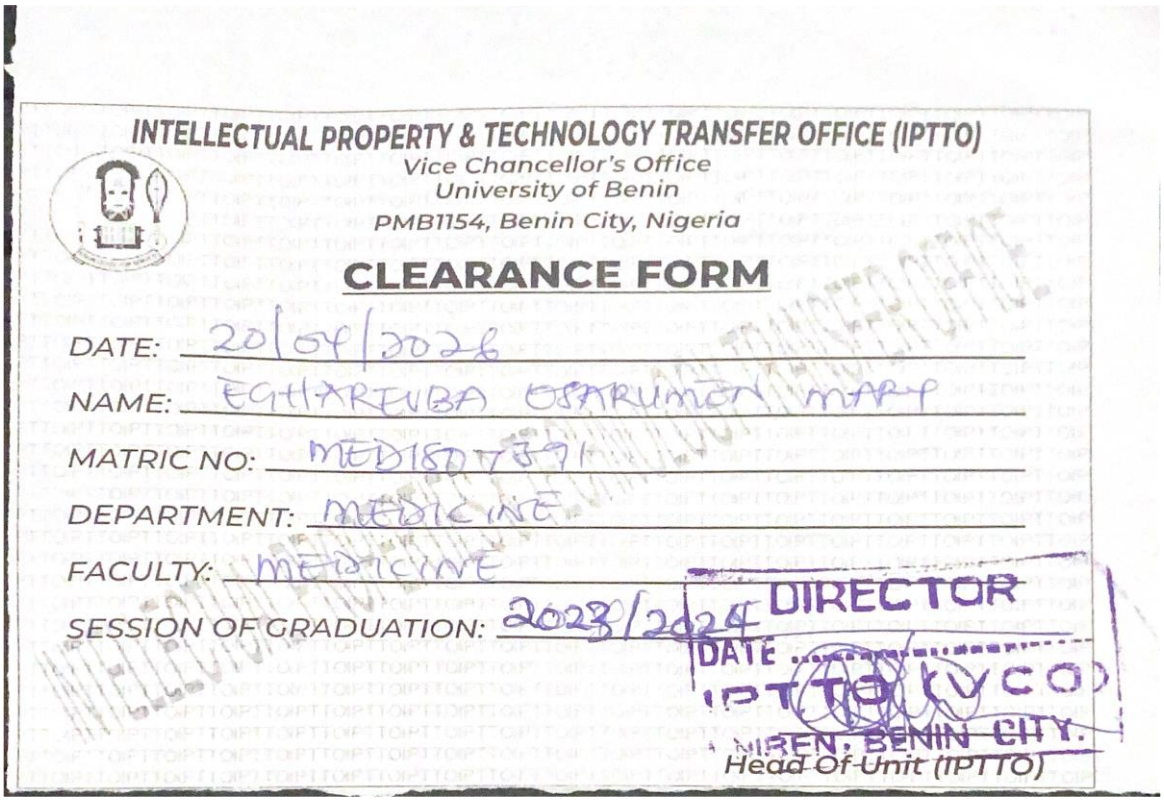
Note that no participant accrual or activity related to this research may be conducted outside of these dates and **you are to furnish the committee with the research activities at the completion of the study.** All informed consent forms used in this study must carry the HREC assigned number and duration 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 18/3/2026

ubthresearchethics@gmail.com

Registration Number: NHREC/24/01/2020

APPENDIX IV (PLAGIARISM TEST)



INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
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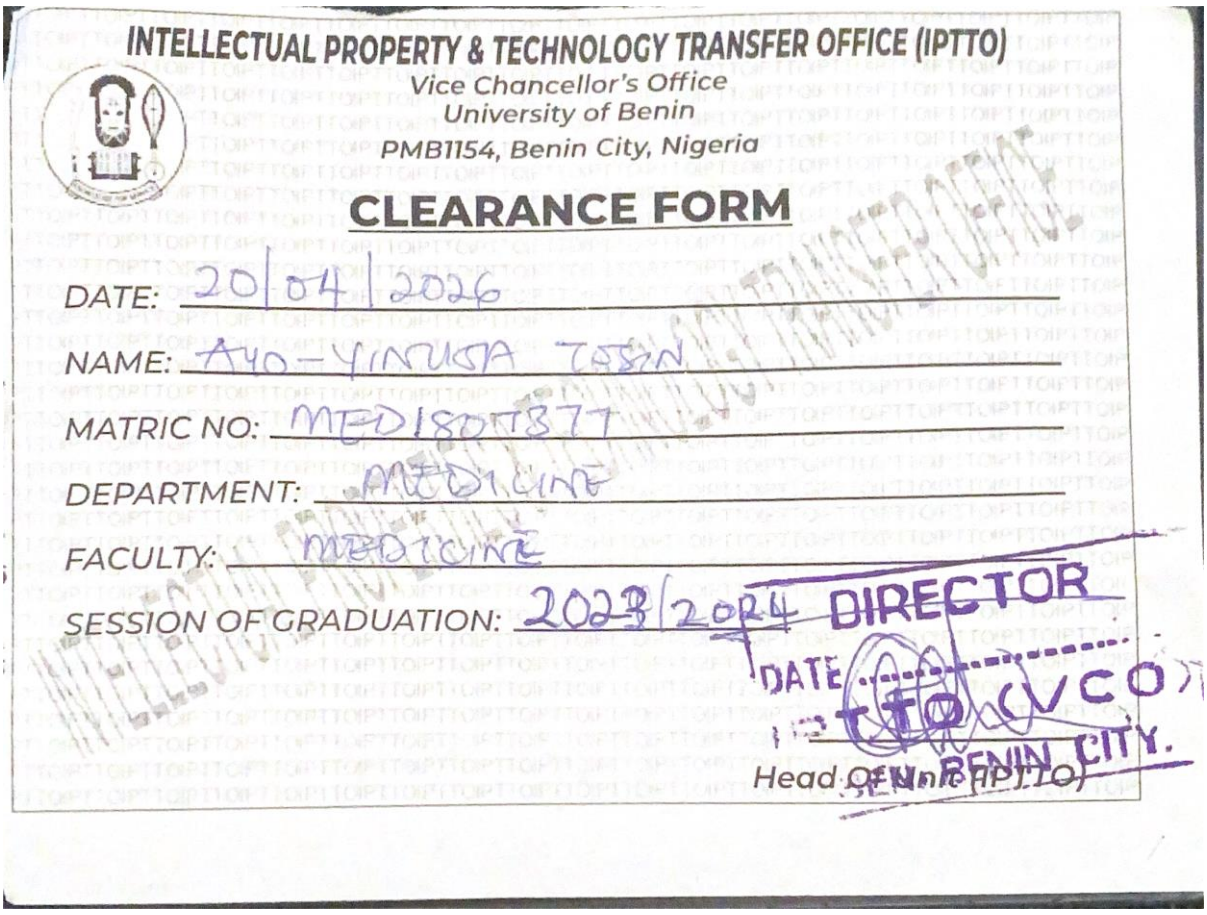
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 20/04/2026
NAME: EGHAREVBA OSARUMEN MARY
MATRIC NO: MED180T891
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2023/2024

DIRECTOR
DATE .....
IPTTO (VCO)
BENIN CITY.
Head Of Unit (IPTTO)



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FACULTY: MEDICINE
SESSION OF GRADUATION: 2023/2024

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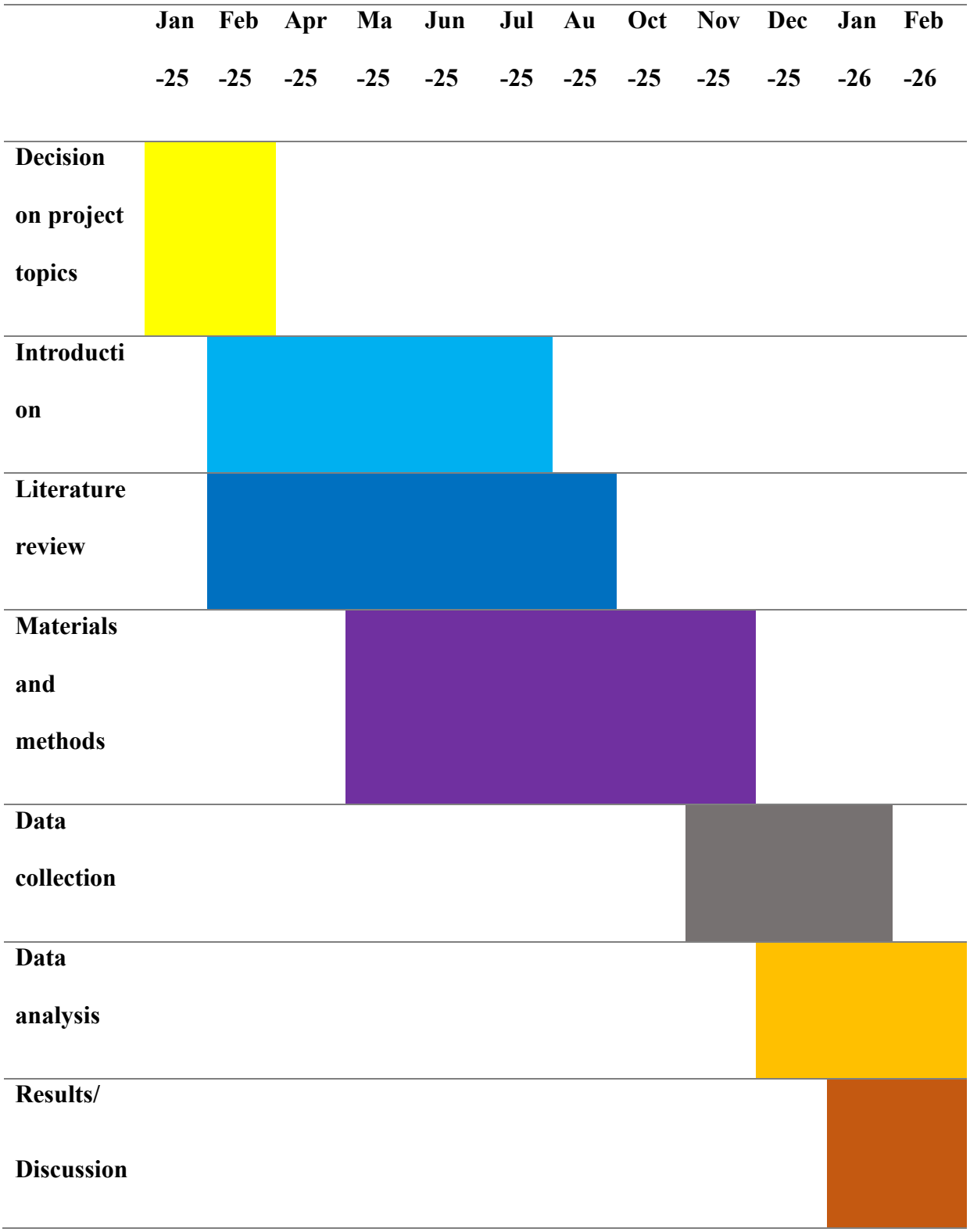
Head Of Unit (IPTTO)

APPENDIX V (GANTT CHART)



- **Figure 1: Gantt chart showing the work plan of the one-year project**