KNOWLEDGE, ATTITUDE AND PRACTICES OF MOTHERS ON THE PREVENTION AND MANAGEMENT OF DIARRHOEA IN CHILDREN UNDER FIVE YEARS, OTJIWARONGO DISTRICT, OTJOZONDJUPA REGION, NAMIBIA.

A THESIS SUBMITTED IN A PARTIAL FULFILLMENT

OF THE REQUIREMENT FOR THE DEGREE OF

MASTER IN PUBLIC HEALTH

OF

THE UNIVERSITY OF NAMIBIA

BY

WILIKKA SHILONGO- MUNENGUNI

200729489

OCTOMBER 2025

SUPERVISOR: DR HERMINE IITA (UNIVERSITY OF NAMIBIA)

CO- SUPERVISOR: MRS. NDASILWOHENDA KATANGOLO-NAKASHWA

(UNIVERSITY OF NAMIBIA)

ABSTRACT

This study aimed to assess knowledge, attitudes, and practices regarding diarrhea prevention and management among mothers of children under 5 years in Otjiwarongo district in the Otjozondjupa region, Namibia. The specific objectives were to assess the general knowledge, attitudes and practices of mothers about diarrhea prevention, and management; to determine mothers' attitudes towards diarrhea prevention and management; and to explore mothers' practices towards the prevention and management of diarrhea in children under five years in Otjiwarongo district, Otjozondjupa region. Employing a quantitative approach using a cross-sectional study, the study utilized simple random sampling to select 390 mothers from Otjiwarongo district clinics and Health Centers. Responses were analyzed using one-sample chi-square tests. The findings revealed significant gaps in knowledge and practices regarding the prevention and management of diarrhea. Approximately 39.1% of mothers lacked understanding of diarrhea as a condition, and 61.1% were unaware of common causes, impacting their ability to prevent and manage diarrhea effectively. Additionally, 49.2% did not recognize the role of hygiene, while 41.2% underestimated the importance of hand washing. Knowledge of oral rehydration therapy (ORT) was deficient in 43.6% of the respondents. Furthermore, 40.4% did not prioritize medical attention, and 45.6% were unaware of the benefits of exclusive breastfeeding. Poor dietary practices were evident as 42.6% had limited knowledge about appropriate nutrition during diarrhea episodes. Vaccination knowledge was lacking in 42.2% of mothers, with substantial gaps in understanding proper waste disposal (42.6%) and clean water importance (48.9%).These findings underscore the need for enhanced education and interventions by the Ministry of Health and Social Services and the Otjozondjupa Region Health Directorate. Strategies should include targeted mothers education programs, improved access to

clean water, and promoting breastfeeding and vaccinations. Education on hygiene, sanitation, and child nutrition is crucial to improve health outcomes for children under five years. Addressing these gaps can significantly reduce the incidence of diarrheal diseases and improve child health in this vulnerable age group.

Keywords: Mothers knowledge, mothers attitudes, mothers practices, children under five years diarrhea, prevention, management, Otjozondjupa, Namibia.

LIST OF TABLES

LIST OF ABBREVIATION AND ACRONYMS

GRN	Government of the Republic of Namibia
HIS	Health Information Systems
HIV	Human Immune Virus
KP	Key Populations
MoHSS	Ministry of Health and Social Services
NGO	Non-Governmental Organization
NSA	Namibia Statistics Agency
UNAM	University of Namibia
USAID	United States Agency for International Development
PEPFAR	President's Emergency Plan for AIDS Relief
WHO	World Health Organization

ACKNOWLEDGEMENTS

I would like to give my appreciation to the University of Namibia (UNAM), which offered me an opportunity to pursue my studies in the Masters of Public Health. Furthermore, I would like to extend my gratitude to the Ministry of Health and Social Services and the Otjozondjupa directorate for granting me approval and support to collect data which contributed greatly in this research study. Special thanks and gratitude go to the people that made contributions to the success of my thesis and research study especially Dr Iita Hermine and Mrs Ndasilwohenda Katangolo- Nakashwa, my supervisors for their continuous guidance, expert technical advice and supervision. Further appreciation goes to Dr Moses Chirimbana for working tirelessly to analyse my data. Lastly, I wholeheartedly appreciate the emotional and financial support from my family, my supportive mentor, my friends as well as helpful colleagues who continuously motivated and encouraged me to finalize this study.

DEDICATION

This study is dedicated to God Almighty, my husband Mr Festus Munenguni, my brother Mr Nathanael Kambonde, and my Children.

DECLARATIONS

I, Wilikka Shilongo- Munenguni, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

No part of this thesis/dissertation may be reproduced, stored in any retrieval system, or transmitted in any form, or by means (e.g. electronic, mechanical, photocopying, recording or otherwise) without the prior permission of the author, or The University of Namibia in that behalf.

I, Wilikka Shilongo - Munenguni, grant the University of Namibia the right to reproduce this thesis in whole or in part, in any manner or format, which The University of Namibia may deem fit.

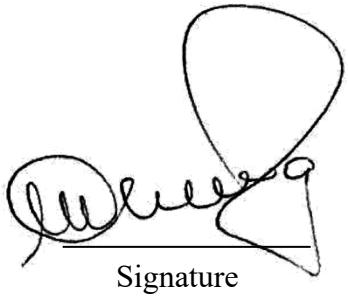
Wilikka Shilongo- Munenguni		OCTOMBER 2025
Name of Student	Signature	Date

TABLE OF CONTENTS

Contents

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Diarrhea remains a significant global public health concern, particularly affecting children under the age of five years. Despite advancements in healthcare and sanitation, diarrhea continues to be a leading cause of childhood morbidity and mortality in many developing regions, including the Otjozondjupa Region of Namibia (1). This study focuses on the "Knowledge, Attitudes, and Practices of Mothers on the Prevention and Management of Diarrhoea in Children Under Five Years in the Otjiwarongo District, Otjozondjupa Region, Namibia."

Diarrhea is a distressing condition that imposes substantial economic and social burdens on families and communities. It can lead to malnutrition, stunted growth, and a compromised quality of life (2). Understanding the factors influencing the prevention and management of diarrhea is crucial, especially in areas with limited healthcare resources and infrastructure. Diarrhea, characterized by the passing of loose or watery stools three or more times a day, can be categorized as acute, persistent, or chronic depending on the duration and symptoms. The causes of diarrhea are diverse, ranging from bacterial agents such as Salmonella to viral infections like Norovirus and Rotavirus, as well as parasitic infections like Giardia (3). It is typically transmitted through contaminated food and water sources, exacerbated by inadequate sanitation and poor hygiene practices (4).

Preventive measures are essential to curb the spread of diarrheal infections. These measures include providing safe drinking water, establishing adequate sanitation facilities, and promoting personal, food, and environmental hygiene. Exclusive breastfeeding during the first six months

of life plays a crucial role in reducing the risk of infection (5). Health education campaigns delivered by healthcare workers help inform communities about the transmission of infections and emphasize the importance of completing immunization schedules (6).

Treatment for diarrhea typically involves the use of oral rehydration solution (ORS) and zinc supplements, which are crucial in preventing dehydration and reducing the severity and duration of diarrhea episodes (7). This study aims to assess the current knowledge, attitudes, and practices of mothers in the Otjiwarongo District to identify gaps and areas for enhancement in public health strategies to improve child health outcomes in this region.

1.2 Background of the study

Diarrhea, defined by the frequent passage of loose or watery stools , remains a significant and urgent public health issue, with a particular impact on children under the age of 5. Diarrhoea is the second leading cause of mortality in this age group worldwide, resulting in the loss of around 760,000 young lives annually. This burden is especially concentrated in regions like Africa and South Asia, where children face a higher risk of this condition (1, 7).

Despite the presence of various preventive measures and treatments such as hand washing, improvement on sanitation, building of toilets in locations, provision of health educations on different topics related to diarrhea, vaccination against diarrhoeal diseases, provision of clean water as well as provision of oral rehydration solution for treating diarrhea, diarrhea remains a significant public health concern, especially among children under the age of five years. The World Health Organization (WHO) reports that diarrhea is the second leading cause of death in this age group, responsible for approximately 760,000 deaths annually, with a disproportionately high burden in Africa and South Asia. Globally, nearly 1.7 billion cases of diarrhea are reported

each year (2). Over the past 25 years, mortality from diarrheal diseases has decreased worldwide. However, in sub-Saharan countries, morbidity and mortality rates remain alarmingly high, particularly among children under five years, especially in middle- and low-income countries. In Namibia, diarrhea ranks as the second leading cause of death among children under five years, with a prevalence rate of 17%, contributing to 5% of all deaths in this age group (4).

The most recent study conducted in the Ohangwena region, particularly in the Engela district, unveiled an even graver concern. The study, which was conducted in 2020, exposed a higher prevalence rate of diarrhea among children under 5 years, which stood at a concerning 23.8%. This prevalence rate not only surpasses the national average but also serves as a stark reminder of the on-going battle against diarrhea in the country.

In the specific context of Otjiwarongo in the Otjozondjupa Region of Namibia, diarrhea is a significant health issue, particularly among children under 5 years. According to the Otjiwarongo health district's annual report for 2019/2020, 6,446 children were diagnosed with diarrhea, with 2,036 cases originating from Otjiwarongo Primary Healthcare, including Orwetoveni Clinic, the focus of the current study. Moreover, 17 deaths due to diarrhea were reported in Otjiwarongo Primary Healthcare in 2020 (5).

The population of Otjiwarongo, as per the 2011 national census, stands at 143,903 people, with a significant portion (31,813) residing in the Otjozondjupa Region, including Otjiwarongo, where 20,163 people live in urban areas. The expansion of informal settlements, characterized by inadequate access to basic services like safe drinking water and sanitation facilities, has exacerbated the risk of diarrheal diseases, especially among vulnerable children under 5 (5).

Numerous strategies and interventions have been implemented to address morbidity related to diarrheal diseases. These include health education initiatives covering various aspects of diarrhea, the construction of pit latrines, the provision of piped water, the employment of health extension workers, and the implementation of integrated management of childhood illness (IMCI) programs (6). Additionally, a comprehensive child survival strategy for 2021-2018 was developed by the Ministry of Health and Social Services in Namibia, with technical support from UNICEF, WHO, and other stakeholders. This strategy aimed to accelerate the reduction of mortality and morbidity among children under 5 years, addressing neonatal causes, preventable diseases (such as pneumonia, diarrhea, measles, malnutrition, and HIV/AIDS), and overall child health. Despite these interventions, studies have revealed gaps in mothers knowledge related to diarrhea, its causes, prevention, and management. Consequently, a need exists for baseline information to inform effective and targeted health education efforts (6).

1.3 Statement of the problem

Within the borders of Namibia, diarrhea assumes a critical dimension in the realm of child health. Data gleaned from the Namibia Demographic and Health Survey of 2018 underscores the gravity of this issue. The survey's findings underscored that diarrhea occupies the unenviable position of being the second leading cause of death among children under 5 years. This pervasive health issue exhibited a national prevalence of 17%, and alarmingly, it accounted for 5% of child mortality in this age category (4).

The Otjiwarongo district, nestled within the Otjozondjupa region, stands witness to a burgeoning and alarming surge in diarrhea cases. A close examination of monthly statistics over the past three months, covering June, July, and August, paints a worrying picture. These figures reveal a steady escalation in the number of diarrhea cases, with the tally surging from 475 to 754 and

eventually to a staggering 895 cases in just three months. However, what makes this trend even more disconcerting is that diarrhea is a condition that is not only preventable but also highly treatable. The efficacy of prevention and management, however, hinges significantly on the knowledge of mothers, who often play a central role in the care of children (6).

Despite the pervasiveness of diarrhea and its profound impact on child health, Namibia remains marked by a conspicuous dearth of studies aimed at comprehensively assessing the knowledge, attitudes, and practices of mothers caring for children under 5 years regarding diarrhea prevention and management. This research gap underscores an urgent need for an in-depth exploration of this critical area. Hence, the overarching objective of this study is to address this research gap by rigorously examining the knowledge, attitudes, and practices of mothers responsible for the care of children under 5 years concerning the prevention and management of diarrhea in the Otjiwarongo district, Otjozondjupa region. The resultant findings will serve as a cornerstone for the development, planning, and implementation of targeted health interventions, geared toward mitigating the incidence of diarrheal morbidity and mortality among the most vulnerable members of society—our children.

1.4. Aims and Objectives

1.4.1 The purpose of the study

The main aim of the study is to assess the knowledge, attitudes and practices of mothers of children under 5 years towards the prevention and management of diarrhea in Otjiwarongo district, Otjozondjupa region.

1.4.2 Research Objectives

1. To assess the general knowledge of mothers on prevention and management of diarrhea in children under five years in Otjiwarongo district, Otjozondjupa region.

2. To determine the attitudes of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

3. To explore practices of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

1.5 Significance of the study

This study holds immense significance for multiple stakeholders, including the Ministry of Health and Social Services, the government of Namibia, and the broader public. Its findings are poised to have far-reaching implications that can positively impact child health and well-being, particularly among children under 5 years, and contribute to the attainment of child survival goals.

The study aimed to assess the knowledge levels among mothers responsible for children under 5 years of age, shedding light on their common attitudes and practices that may contribute to the development of diarrhea in children. Such insights are invaluable for the Ministry of Health and Social Services in Namibia, as well as the government at large. The study's findings can serve as a foundation for evidence-based policymaking and the development of targeted health strategies. By identifying gaps in knowledge and common misconceptions, the study can pave the way for tailored interventions that address specific challenges in diarrhea prevention and management.

Diarrhea remains a significant contributor to child morbidity and mortality. Understanding the factors influencing diarrhea development and spread can aid in devising interventions that

accelerate the reduction of diarrhea-related morbidity and mortality among children under 5 years. Achieving child survival goals, as outlined in international frameworks and national health agendas, becomes more attainable when supported by comprehensive research that identifies actionable areas for improvement.

The findings of this study will provide crucial information to assist in the development, planning, and implementation of interventions aimed at reducing the incidence of diarrhea cases among children under 5 years. By addressing the root causes of diarrhea, improving awareness, and promoting appropriate practices, health services can be tailored to be more effective and responsive to the specific needs of the community, especially in the Otjiwarongo district. This not only enhances the quality of health services but also ensures that resources are allocated where they are most needed. As one of the first studies of its kind in Namibia, this research effort will contribute to the general knowledge and the body of academic literature focused on child health and disease prevention. Its insights, methodologies, and outcomes can serve as a valuable source of reference for future studies, both within Namibia and in similar contexts worldwide. Researchers and academics can build upon this foundational work, further enriching the discourse on diarrhea prevention and management. In a dynamic field like public health, where knowledge evolves continually, the findings of this study can guide decision-making processes and facilitate policy changes related to diarrhea disease prevention and management. Evidence-based recommendations stemming from this research can influence the design and implementation of health programs and interventions at local, regional, and national levels.

The information gathered from this pioneering study may be harnessed to enhance the effectiveness and acceptance of health messages and services aimed at preventing and managing diarrhea among children under 5 years. By tailoring interventions to address specific gaps in

knowledge and practices identified through the study, health service provision can become more efficient and impactful.

1.6 Definition of terms

Diarrhea: Diarrhea refers to the passage of loose or watery stools three or more times in a day and can be caused by various factors, including infections, viruses, and parasites (1). In the context of this study, diarrhea pertains to the frequent passage of loose or watery stools in children under five years of age within the Otjiwarongo district, Otjozondjupa region, Namibia.

Knowledge: Knowledge encompasses awareness, information, and understanding about a particular subject or topic, gained through learning and experience (10). In the study's context, knowledge refers to the level of awareness and understanding that mothers of children under five years in the Otjiwarongo district have regarding the causes, prevention, and management of diarrhea in their children.

Attitude: Attitude represents a person's predisposition or feelings toward a particular object, situation, or concept, which can influence their behaviour and responses (3). In this research, attitude pertains to the mothers' outlook, feelings, and perceptions regarding diarrhea, its prevention, and management in their children.

Practices: Practices encompass the actions, behaviours, or activities that individuals engage in, often influenced by their knowledge and attitudes (2). the study, practices refer to the specific actions and behaviours employed by mothers in the Otjiwarongo district to prevent and manage diarrhea in their children under five years old.

Prevention: Prevention involves the measures and strategies taken to stop or reduce the occurrence of a particular health issue or problem (11). In the study's context, prevention relates

to the efforts made by mothers to proactively avoid or minimize the likelihood of their children developing diarrhea.

Management: Management refers to the organized processes and actions taken to address and control a particular condition or situation effectively (9). Within this research, management pertains to the structured approaches and interventions employed by mothers to treat and control diarrhea in their children under five years old.

Mother: A mother is a female parent who gives birth to and nurtures and cares for her offspring (12).: In the study, a mother specifically refers to all female caregivers example aunt, grandmothers who are responsible for the health and well-being of children under five years of age in the Otjiwarongo district, Otjozondjupa region, Namibia.

Children under five years: Children refer to a young human being below the age of puberty.(12) In this study, children refers to any young human being under the age of five years in Otjiwarongo district, Otjozondjupa region.

1.7 Thesis Outline

Chapter One: Introduction Chapter one initiates our research journey by introducing the study's focus and context. It outlines the problem, objectives, and research questions, providing a clear sense of purpose. This chapter also highlights the significance of the study and sets the boundaries within which it operates.

Chapter Two: Review of Related Literature In this chapter, we delve into existing knowledge on our chosen topic. We synthesize previous research to refine our understanding and identify gaps. This informs our study and helps build upon prior insights.

Chapter Three: Research Methodology Chapter three lays out the research methodology, serving as the blueprint for our investigation. It explains the research design, defines the study population, and details data collection and analysis methods. Ethical considerations are also addressed.

Chapter Four: Presentation and Discussion of Research Findings This pivotal chapter presents our research findings, weaving them into a rich tapestry of descriptions and discussions. We relate our empirical evidence to existing literature, providing depth and authenticity to our interpretations.

Chapter Five: Conclusion, Recommendations, and Future Research Chapter five serves as a culmination of our research journey. We summarize key findings, draw conclusions, and offer practical recommendations for practitioners and policymakers. Additionally, we point towards future research directions, inviting further exploration of the subject matter.

1.8 Chapter Summary

Diarrhea remained a significant global public health concern, particularly among children under the age of 5. Despite advancements in healthcare and sanitation, diarrhea had continued to be a leading cause of childhood morbidity and mortality in many developing regions, including the Otjozondjupa Region of Namibia. The study delved into the critical issue of "Knowledge, Attitude, and Practices towards the Prevention and Management of Diarrhea among mothers of children under 5 Years in Otjiwarongo District in the Otjozondjupa Region, Namibia." Diarrhea had not only been a distressing condition for children but had also posed substantial economic and social burdens on families and communities. It could lead to malnutrition, stunted growth, and a compromised quality of life. Understanding the factors influencing the prevention and

management of diarrhea had been paramount in curbing its impact, particularly in regions with limited healthcare resources and infrastructure. This introductory chapter had set the stage by providing a comprehensive overview of the research's context, the issues it sought to address, its objectives, and the broader significance it held within the realm of health.

The following section was arranged as follows: the background of the study, statement of the problem, purpose of the study, objectives of the study, and the research questions. The section further provided the significance of the study, limitations, delimitations, definition of the terms, and the summary. Building on this analysis, chapter two delve into literature review to provide a comprehensive understanding of existing knowledge on the topic and allowing the researcher to identify the gap in research and to avoid unnecessary duplication of work.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the study delves into the theoretical framework underpinning the research and offers a comprehensive conceptualization of diarrhea within the study's context. Diarrhea, as a multifaceted health concern, demands a nuanced understanding that encompasses various dimensions, from its aetiology to its social and economic implications. Throughout this scholarly journey, the study's research objectives serve as a guide. The study aims to assess the general knowledge possessed by mothers regarding diarrhea, its origins, preventive measures, and management strategies. Additionally, it aims to explore the attitudes held by mothers concerning the prevention and management of diarrhea. These attitudes, influenced by a multitude of factors, play a crucial role in shaping maternal behaviors.

Within this literature review chapter, the study embarks on a rigorous and systematic examination of the existing body of knowledge. By critically appraising previous studies, the study aims to build upon prior insights, identify gaps in the literature, and establish a robust foundation for the research endeavors. This literature review functions as the intellectual compass guiding the study's understanding, informing the research methodology, and contributing to a more comprehensive analysis of the complex interplay between maternal knowledge, attitudes, practices, and the prevalence of diarrhea among young children.

2.2 Contextualizing Knowledge, Attitude and Practices towards the Prevention and Management of Diarrhea

The conceptualization of Knowledge, Attitude, and Practices (KAP) Towards the Prevention and Management of Diarrhea within the context of this research is grounded in a multidimensional framework that draws from an extensive body of literature. Diarrhea, as a global public health concern, is characterized by its prevalence among children under the age of 5 and its significant impact on morbidity and mortality, especially in resource-constrained regions (52). This conceptualization aligns with the understanding that diarrhea is not merely a medical condition but a complex interplay of factors encompassing health knowledge, individual attitudes, and everyday practices. Knowledge refers to the awareness and understanding of mothers regarding diarrhea, including its aetiology, modes of transmission, risk factors, and the importance of preventive measures. It encompasses the grasp of critical information derived from healthcare providers, educational materials, and personal experiences (46). Knowledge serves as the foundation upon which attitudes and practices are built, influencing maternal behaviours in preventing and managing diarrhea.

Attitude encompasses the emotional and psychological predisposition of mothers toward diarrhea prevention and management. It reflects their feelings, beliefs, and perceptions regarding the significance of the issue and the effectiveness of various interventions. Attitudes can be shaped by cultural norms, community influences, and past experiences, ultimately guiding maternal decision-making and actions). Practices refer to the tangible actions and behaviours adopted by mothers to prevent and manage diarrhea in their children under 5 years old. These practices encompass a range of activities, including but not limited to proper hygiene practices, timely healthcare seeking behaviours, appropriate nutrition, and the administration of oral rehydration

therapy (). Practices are influenced by both knowledge and attitude, as well as contextual factors such as socioeconomic status and access to healthcare services.

Within this KAP framework, it is essential to consider the broader context of healthcare infrastructure, socioeconomic conditions, and cultural beliefs, as they can significantly influence maternal KAP regarding diarrhea (26). The effectiveness of diarrhea prevention and management strategies relies on the synergy between maternal knowledge, attitudes, and practices, all operating within the unique sociocultural and economic context of the Otjiwarongo district in the Otjozondjupa Region, Namibia. This comprehensive conceptualization serves as the foundation for our research, enabling us to explore the intricate relationships between maternal KAP and the prevalence of diarrhea among children under 5 years, with the ultimate goal of informing targeted interventions and improving child health outcomes in the study area.

2.3 Theoretical Framework

One suitable theoretical framework for the study on "Knowledge, Attitude, and Practices (KAP) Towards the Prevention and Management of Diarrhea" is the Health Belief Model (HBM). The Health Belief Model is a well-established theoretical framework widely employed in public health research to elucidate and elucidate health-related behaviours (1).

The Health Belief Model postulates that an individual's engagement in health-promoting behaviours is influenced by several pivotal factors. These factors encompass: Perceived Susceptibility: This factor revolves around an individual's perception of their susceptibility to a particular health condition. Within the context of this study, it pertains to how mothers perceive the vulnerability of their children to diarrhea (3). Perceived Severity: Perceived Severity is the individual's perception of the seriousness of the health condition. In this study, it encompasses

mothers' comprehension of the severity of diarrhea and its potential repercussions for their children's health (12).

Perceived Benefits: This aspect centers on the individual's evaluation of the effectiveness of preventive and management measures. In the context of this study, it encompasses mothers' beliefs regarding the efficacy of various practices, such as hygiene and oral rehydration therapy, in preventing and managing diarrhea (13). Perceived Barriers: Perceived Barriers refer to the obstacles or challenges that individuals perceive when adopting health-promoting behaviours. In this study, it encompasses the barriers or challenges faced by mothers in implementing preventive and management practices for diarrhea (14).

Cues to Action: Cues to Action are external stimuli or triggers that prompt individuals to take health-related actions. This could include recommendations from healthcare providers, community awareness campaigns, or personal experiences with diarrhea (10). Self-Efficacy: Self-Efficacy is the individual's belief in their ability to successfully perform recommended health behaviours. In this study, it involves assessing mothers' confidence in their capability to carry out preventive and management practices effectively (15).

The justification for employing the Health Belief Model in this study is rooted in its relevance to the research objectives. The model is well-aligned with the goal of comprehending maternal knowledge, attitudes, and practices related to diarrhea (17). By utilizing this model, the study aims to systematically investigate how mothers perceive susceptibility and severity, their beliefs regarding preventive measures, barriers they encounter, and the factors that motivate them to take action. Moreover, the Health Belief Model offers a structured framework for the development of interventions. It facilitates the identification of factors influencing maternal

behaviour, which, in turn, aids in the formulation of targeted interventions aimed at enhancing knowledge, altering attitudes, and promoting best practices for preventing and managing diarrhea in children under 5 years old (19).

2.4 Mother's knowledge towards the prevention and management of diarrhea

Diarrhea remains a significant global public health concern, especially in children under the age of 5 years. Despite advancements in healthcare and sanitation, diarrhea continues to be a leading cause of childhood morbidity and mortality in developing regions like the Otjozondjupa Region of Namibia (1). This study focuses on "Knowledge, Attitudes, and Practices of Mothers on the Prevention and Management of Diarrhea in Children Under Five Years in the Otjiwarongo District, Otjozondjupa Region, Namibia."

Diarrhea is a distressing condition that imposes substantial economic and social burdens on families and communities. It can lead to malnutrition, stunted growth, and a compromised quality of life (2). Understanding the factors influencing the prevention and management of diarrhea is crucial, especially in areas with limited healthcare resources and infrastructure. Past studies have shown that mothers' knowledge significantly impacts their ability to prevent and manage diarrhea effectively (3).

Mothers play a crucial role in managing childhood illnesses, including diarrhea. Their knowledge and practices directly influence the health outcomes of their children. A study conducted in Kenya found that only 40% of mothers knew the correct causes and prevention methods for diarrhea, highlighting a crucial gap in health education (4). Similarly, research in Ghana identified that a significant number of mothers were unaware of ORS, an essential treatment for

dehydration caused by diarrhea, which suggests inadequate dissemination of information (5). Mothers' attitudes towards diarrhea prevention and management greatly affect how they respond to the condition. In a study from Bangladesh, mothers who perceived diarrhea as a serious health threat were more likely to seek medical attention promptly and adhere to recommended practices, such as ORS use and proper hydration (6). Conversely, misconceptions about the causes and lesser emphasis on preventive measures were linked to the persistence of poor management practices in some communities (7).

In terms of practices, a South African study revealed that while many mothers adopted basic hygiene measures, such as handwashing and safe food storage, only a minority practiced exclusive breastfeeding for the first six months, which is recommended to reduce diarrheal risk (8). Moreover, access to accurate and practical information proved to be a determining factor in the adoption of effective diarrhea management strategies among mothers (9).

In Namibia, particularly in the Otjozondjupa Region, similar challenges exist. Many mothers lack comprehensive knowledge about the causes and management of diarrhea, which affects how they care for their children during diarrheal episodes. The disparity in education and healthcare access, especially between urban and rural areas, further complicates these issues (10). Consequently, this study aims to fill the gaps identified in previous research by exploring current knowledge levels, attitudes, and practices among mothers in the Otjiwarongo District.

By understanding these dimensions, targeted educational interventions can be developed to improve maternal practices and reduce the incidence and impact of diarrhea among children under five. This research seeks to provide comprehensive data that will inform public health strategies and educational programs tailored to the specific needs of mothers in Namibia.

2.4.1 Causes of Diarrhea

Understanding the various causes of diarrhea, including infectious agents, contaminated water, and poor hygiene practices. Diarrhea is a prevalent health concern, especially among children under the age of 5, and understanding its causes is crucial for prevention and management (3). The causes of diarrhea can be multifactorial and encompass a range of factors, including infectious agents, poor sanitation, contaminated water sources, and inadequate hygiene practices (4).

Infectious agents play a significant role in causing diarrhea, with bacteria, viruses, and parasites being common culprits (1; 5). Bacterial pathogens such as Escherichia coli (E. coli), Salmonella, and Shigella can contaminate food and water sources, leading to diarrheal infections (6). Viruses like rotavirus and norovirus are highly contagious and can spread through person-to-person contact or contaminated surfaces (6). Parasites such as Giardia and Cryptosporidium can also cause diarrhea, often through the ingestion of contaminated water or food (6). In addition to infectious causes, non-infectious factors like food allergies, medications, and underlying medical conditions can contribute to diarrhea episodes (6). Environmental factors, including poor sanitation and lack of access to clean water sources, can facilitate the transmission of diarrheal pathogens (6). Inadequate hygiene practices, such as improper hand washing, can also contribute to the spread of infectious agents (5).

Moreover, the prevalence of diarrhea can be influenced by socioeconomic conditions, healthcare infrastructure, and cultural beliefs within specific regions or communities (4; 1). These contextual factors can impact the knowledge, attitudes, and practices of mothers regarding diarrhea prevention and management.

2.4.2 Risk Factors

Awareness of the factors that increase the risk of diarrhea, such as inadequate sanitation facilities and malnutrition. Risk factors are characteristics, conditions, behaviours, or exposures that increase the likelihood of an individual or population developing a particular health condition or experiencing a specific outcome. In the context of diarrhea among children under 5 years old and maternal knowledge, attitudes, and practices (KAP) towards its prevention and management, several risk factors can be identified. These risk factors can contribute to the occurrence and severity of diarrhea in this age group and may be influenced by various socioeconomic, environmental, and individual factors. Here are some common risk factors associated with diarrhea among children under 5:

Insufficient access to clean and safe drinking water sources can lead to waterborne infections, a common cause of diarrhea in children (7).Inadequate sanitation facilities and practices can result in the contamination of water and food sources with diarrheal pathogens (56).

Poor hand washing practices and inadequate personal hygiene can facilitate the transmission of infectious agents that cause diarrhea (22).Under nutrition and micronutrient deficiencies can weaken a child's immune system and increase susceptibility to diarrheal infections (8).Families with limited financial resources may struggle to provide nutritious food and access to healthcare, increasing the risk of diarrhea (26).Overcrowding in households and communities can facilitate the spread of infectious agents, increasing the risk of diarrheal outbreaks (8).

Inadequate access to healthcare services, including vaccination and treatment, can delay appropriate care for diarrheal illnesses (26). Maternal or caregiver knowledge, attitudes, and

practices towards diarrhea prevention and management can significantly impact a child's risk of experiencing severe diarrhea (46). Children with weakened immune systems, such as those living with HIV, may be at higher risk of developing severe or persistent diarrhea(41). Consumption of contaminated or improperly prepared food, including infant formula and complementary foods, can introduce infectious agents that lead to diarrhea (8).

Exposure to environmental toxins and pollutants can contribute to gastrointestinal distress and diarrhea (8). Changes in climate and seasonal variations can affect the prevalence of diarrheal diseases, with some pathogens being more active during certain times of the year (51).

These risk factors are interconnected and may vary in significance depending on the specific geographical location and socioeconomic conditions of the population being studied. Understanding these risk factors is essential for designing effective interventions to prevent and manage diarrhoea among children under 5 years old.

2.4.3 Signs and Symptoms

Recognizing the common signs and symptoms of diarrhoea in children, such as watery stools, dehydration, and fever. Signs and symptoms are essential indicators of a health condition, helping healthcare professionals and individuals identify the presence or progression of a disease or illness. In the case of diarrhoea among children under 5 years old, recognizing the signs and symptoms is crucial for early intervention and appropriate management. Here are some common signs and symptoms associated with diarrhea in this age group. Diarrhea is characterized by an increased frequency of bowel movements with loose or watery consistency (9).

Diarrhea can lead to dehydration, which is often indicated by symptoms such as dry mouth, sunken eyes, decreased urination, and increased thirst (22). Children with diarrhea may

experience abdominal discomfort or cramps, which can be distressing (Mayo Clinic, 2023). In some cases, diarrhea may be accompanied by a fever, which can indicate an underlying infection (8). Children with diarrhea may feel nauseous and may vomit, which can contribute to fluid loss (22). In severe cases or when caused by specific infections or conditions, blood may be present in the child's stools (22).

Persistent diarrhea can lead to weight loss, especially if it interferes with the child's ability to eat and absorb nutrients (9). Children with diarrhea may become irritable and fatigued due to discomfort and dehydration (23). Diarrhea can lead to a reduced appetite, making it challenging for children to maintain proper nutrition (22). Prolonged diarrhea can result in overall weakness and a decrease in activity levels (23).

It's important to note that the severity and duration of diarrhea, as well as the presence of these symptoms, can vary widely depending on the underlying cause. Additionally, diarrhea can be a symptom of various infections, gastrointestinal disorders, or other health conditions. Timely recognition of these signs and symptoms is essential for seeking appropriate medical care and preventing complications, particularly in young children who are more vulnerable to the effects of dehydration and malnutrition (22).

2.4.4 Transmission

Knowledge of how diarrhea is transmitted, including the fecal-oral route and person-to-person contact. Transmission refers to the process by which infectious agents, such as bacteria, viruses, parasites, or other microorganisms, are spread from one person or organism to another, leading to the potential development of an infection or disease. In the context of diarrheal diseases among children under 5 years old, several modes of transmission are relevant. The most common

mode of transmission for many diarrheal pathogens is the fecal-oral route. This occurs when infectious agents from faeces are ingested through contaminated food, water, objects, or hands (8).

Diarrheal diseases can spread directly from an infected person to another through close contact, such as touching, kissing, or caring for an infected individual (8). Consumption of food or water contaminated with diarrheal pathogens, often due to inadequate hygiene and sanitation practices, can lead to infection (23). Inanimate objects or surfaces that have been contaminated with infectious agents, such as toys, utensils, or bathroom fixtures, can serve as sources of transmission when touched or used by others (22). Some diarrheal diseases can be transmitted by vectors like flies or insects that come into contact with contaminated faeces and then transfer the pathogens to food or surfaces (52). In certain cases, diarrheal pathogens can be transmitted from animals to humans (zoonoses) through contact with infected animals or consumption of contaminated animal products (9).

While less common, certain respiratory viruses can cause diarrhea and may be transmitted through respiratory droplets when an infected person coughs or sneezes (14). Water sources, soil, and the environment can become contaminated with diarrheal pathogens, posing a risk of transmission when individuals come into contact with these contaminated elements (53).

It's important to recognize that the specific mode of transmission can vary depending on the causative agent of diarrhea. Additionally, the prevention of diarrheal diseases often involves interrupting these modes of transmission through strategies such as improved hygiene, access to clean water and sanitation facilities, vaccination, and public health interventions (52).

2.4.5 Hygiene Practices

Familiarity with proper hygiene practices, such as hand washing with soap and clean water, to prevent diarrhea. Hygiene practices play a critical role in preventing diarrheal diseases, especially among children under 5 years old who are particularly vulnerable to infections. Proper hygiene practices help reduce the risk of contamination and transmission of diarrheal pathogens. Here are key hygiene practices relevant to the prevention of diarrheal diseases. Thorough and regular hand washing with soap and clean water is one of the most effective ways to prevent the spread of diarrheal pathogens (9). Hands should be washed after using the toilet, changing diapers, and before preparing or consuming food (8).

Ensuring that drinking water is safe and free from contamination is essential. Water should be obtained from safe sources, treated if necessary, and stored in clean containers to prevent waterborne diarrheal diseases (51). Access to improved sanitation facilities, including proper toilets and latrines, is crucial to prevent the contamination of the environment and water sources with fecal matter (53). Proper food handling, storage, and cooking are essential to prevent foodborne diarrheal illnesses (9). Food should be cooked thoroughly, stored at safe temperatures, and protected from flies and other contaminants. Promoting exclusive breastfeeding for the first six months of life provides essential nutrients and antibodies to infants, reducing the risk of diarrheal infections (54).

Diapers should be changed promptly, and soiled diapers should be disposed of hygienically to prevent the spread of pathogens (8).Individuals should maintain good personal hygiene, including trimming fingernails, keeping hair clean, and avoiding behaviours like nose-picking to

reduce the risk of introducing pathogens into the body (8). Communities should have access to safe and clean public facilities, including hand washing stations, to encourage proper hygiene practices (46).

Public health campaigns and education programs can raise awareness about the importance of hygiene practices in preventing diarrheal diseases. This includes educating caregivers and mothers about safe childcare and feeding practices (52). In some cases, vaccination against specific diarrheal pathogens, such as rotavirus, can be an effective preventive measure (51).

2.4.6 Oral Rehydration Therapy (ORT)

Understanding the importance of ORT in treating dehydration caused by diarrhea and how to prepare and administer oral rehydration solutions. Hygiene practices play a critical role in preventing diarrheal diseases, especially among children under 5 years old who are particularly vulnerable to infections. Proper hygiene practices help reduce the risk of contamination and transmission of diarrheal pathogens. Here are key hygiene practices relevant to the prevention of diarrheal diseases.

Thorough and regular hand washing with soap and clean water is one of the most effective ways to prevent the spread of diarrheal pathogens (9). Hands should be washed after using the toilet, changing diapers, and before preparing or consuming food (8). Ensuring that drinking water is safe and free from contamination is essential. Water should be obtained from safe sources, treated if necessary, and stored in clean containers to prevent waterborne diarrheal diseases (54). Access to improved sanitation facilities, including proper toilets and latrines, is crucial to prevent the contamination of the environment and water sources with fecal matter (51).

Proper food handling, storage, and cooking are essential to prevent foodborne diarrheal illnesses (9). Food should be cooked thoroughly, stored at safe temperatures, and protected from flies and other contaminants.

Promoting exclusive breastfeeding for the first six months of life provides essential nutrients and antibodies to infants, reducing the risk of diarrheal infections (53).Diapers should be changed promptly, and soiled diapers should be disposed of hygienically to prevent the spread of pathogens (8). Individuals should maintain good personal hygiene, including trimming fingernails, keeping hair clean, and avoiding behaviours like nose-picking to reduce the risk of introducing pathogens into the body (8).

Communities should have access to safe and clean public facilities, including hand washing stations, to encourage proper hygiene practices (46). Public health campaigns and education programs can raise awareness about the importance of hygiene practices in preventing diarrheal diseases. This includes educating caregivers and mothers about safe childcare and feeding practices (52). In some cases, vaccination against specific diarrheal pathogens, such as rotavirus, can be an effective preventive measure (51).

2.4.6 Exclusive Breastfeeding

Knowledge of the benefits of exclusive breastfeeding for infants in preventing diarrhea and the recommended duration of exclusive breastfeeding. Exclusive breastfeeding is recommended for the first six months of a baby's life, during which no other foods or liquids are introduced (43). Breast milk is highly nutritious and contains all essential nutrients for a baby's growth and development (44). Breast milk provides antibodies and immune factors that protect the baby

from infections (45).Breast milk is easily digested, reducing the likelihood of constipation and allergies (43).

Breastfeeding fosters a strong emotional bond between the mother and baby (43). Exclusive breastfeeding helps mothers lose pregnancy weight more quickly (43). Breastfeeding triggers uterine contractions, aiding in the uterus's return to its pre-pregnancy size (46). Lactational amenorrhea can provide some natural contraception, although it is not fool proof (44). Breastfeeding fosters a close emotional bond between the mother and baby (43). Colostrum, the first milk produced by the mother's breasts, is rich in antibodies and nutrients, providing vital immune protection to the new-born (43).

After six months, complementary solid foods should be introduced while continuing breastfeeding for up to two years or beyond (43). Exclusive breastfeeding is actively promoted and supported by healthcare providers, public health programs, and organizations like UNICEF and WHO (44). Some mothers may face challenges with breastfeeding, such as difficulties, work-related issues, or lack of social support, which need to be addressed (43). Exclusive breastfeeding is a key strategy to reduce infant mortality and improve child health globally and aligns with the Sustainable Development Goals (SDGs) (47).

2.4.8 Nutrition

Awareness of the role of nutrition in preventing diarrhea and the importance of providing balanced meals to children. Nutrition is a fundamental component of maintaining overall health and well-being, encompassing the intake of food and nutrients necessary for supporting various bodily functions. A well-rounded understanding of nutrition is crucial for achieving optimal

health and preventing various health conditions. Here are key points about nutrition, supported by in-text references:

Macronutrients are the major nutrients required in substantial quantities and include: Carbohydrates, which serve as the body's primary source of energy, are found in foods like grains, fruits, and vegetables (22). Proteins, essential for tissue repair and growth, are present in foods such as meat, fish, dairy, and legumes (22). Fats, which provide energy and support various bodily functions, can be found in foods like oils, nuts, and fatty fish (22).

Vitamins, organic compounds crucial for various biochemical processes. For example, vitamin C supports the immune system, while vitamin D is essential for bone health (28). Minerals, inorganic nutrients with significant roles, such as calcium for bone health and iron for oxygen transport (28). The energy derived from food is measured in calories, and maintaining a balance between calorie intake and energy expenditure is vital for sustaining a healthy weight (26). A balanced diet includes a variety of foods from different food groups to ensure the intake of all necessary nutrients (30). Staying properly hydrated is essential for various bodily functions, as water plays a critical role in digestion, circulation, and temperature regulation (41).

Nutritional needs vary based on factors such as age, gender, activity level, and overall health. For instance, infants, children, adults, and pregnant or breastfeeding women have distinct nutritional requirements (28). Inadequate intake of specific nutrients can lead to deficiencies, resulting in conditions such as iron deficiency anemia or scurvy due to a lack of vitamin C (28). Excessive calorie intake and poor dietary choices can contribute to conditions like obesity, heart disease, and type 2 diabetes (22).

Certain individuals may follow special diets due to dietary restrictions, allergies, or health conditions. Examples include vegetarian, vegan, gluten-free, or ketogenic diets (45). Proper nutrition is closely associated with overall health. Maintaining a balanced diet can reduce the risk of chronic diseases such as heart disease, hypertension, and specific cancers (44). Promoting nutrition education and awareness is essential to help individuals make informed dietary choices and lead healthier lives (43). Nutrition is a global concern, with issues related to malnutrition, food security, and access to nutritious foods affecting populations worldwide (43).

2.4.9 Vaccination

Knowledge of vaccines that can prevent diarrhea, such as the rotavirus vaccine, and the importance of vaccination schedules. Vaccination is a critical public health intervention aimed at preventing infectious diseases by stimulating the immune system to produce an immune response against specific pathogens. Vaccines have significantly reduced the incidence of many dangerous diseases, saved countless lives, and contributed to global health. Here are key points about vaccination, supported by in-text references:

Vaccination involves the administration of vaccines, which contain weakened, inactivated, or components of pathogens. These substances stimulate the immune system to produce antibodies and build immunity to the disease (8). Vaccines are designed to prevent various infectious diseases, including measles, polio, influenza, hepatitis, and COVID-19, among others (8). Widespread vaccination within a population can lead to herd immunity, protecting those who cannot be vaccinated, such as individuals with certain medical conditions (41).

Vaccines come in different types, including live attenuated, inactivated, subunit, conjugate, and mRNA vaccines, each designed to target specific pathogens (8). Childhood immunization schedules are established to protect children from vaccine-preventable diseases. These schedules vary by country and include vaccines against measles, mumps, rubella, diphtheria, tetanus, and more (52). Adults also benefit from vaccines, including those for influenza, pneumococcal diseases, shingles, and COVID-19 (53). Some vaccines require booster doses to maintain immunity over time. Booster shots are administered at specified intervals (8).Vaccines undergo rigorous testing for safety and efficacy before approval. Surveillance systems continuously monitor vaccine safety (50).

Vaccine hesitancy refers to reluctance or refusal to be vaccinated despite vaccine availability. Addressing vaccine hesitancy is crucial for achieving herd immunity (53). International organizations like the World Health Organization (WHO) and Gavi, the Vaccine Alliance, work to ensure equitable access to vaccines worldwide, particularly in low-income countries (52).

2.4.10 Seeking Medical Care

Understanding when it is essential to seek medical care for a child with diarrhea, especially in cases of severe dehydration or persistent symptoms. Seeking medical care is a crucial aspect of maintaining one's health and addressing medical issues promptly. It involves reaching out to healthcare providers for diagnosis, treatment, and preventive care. Here are key points about seeking medical care, supported by in-text references: Primary care providers, such as family doctors or internists, are often the first point of contact for routine medical care, preventive services, and initial evaluations of health concerns (44).

Urgent care centers offer immediate medical attention for non-life-threatening conditions, including minor injuries and illnesses, outside regular office hours (28). Hospital emergency rooms are equipped to handle critical and life-threatening situations, such as severe injuries, chest pain, and serious illnesses (29). Primary care providers may refer patients to specialists for specific medical conditions that require specialized evaluation and treatment (28).

Seeking regular check-ups and screenings is essential for preventive care and early detection of health issues (30). Telemedicine allows patients to consult with healthcare professionals remotely, providing access to medical advice and treatment without in-person visits (29).Health insurance coverage can significantly affect access to medical care. Understanding insurance benefits and networks is important for healthcare choices (28). Prompt medical care is essential for addressing acute conditions, managing chronic illnesses, and preventing complications (30). Regularly scheduling and receiving recommended vaccinations is crucial for individual and public health (52).

Periodic health screenings, such as mammograms, colonoscopies, and blood pressure checks, aid in early detection and prevention of diseases (53). Individuals with chronic conditions, like diabetes or hypertension, benefit from ongoing medical care and management to control their conditions (42). Patients can actively engage in their healthcare by asking questions, seeking second opinions, and understanding their treatment options (40). In emergencies, calling 911 or local emergency services is vital for immediate medical attention (44).

Accessing mental health services is crucial for individuals dealing with mental health conditions, and seeking help can improve overall well-being (53). Addressing healthcare disparities is important for ensuring equitable access to medical care for all populations (U.S. Department of

Health & Human Seeking medical care is a fundamental part of maintaining and improving health. Accessing appropriate care in a timely manner is essential for preventing and treating illnesses, promoting well-being, and addressing health disparities.

2.5 Mother's attitude towards the prevention and management of diarrhea

2.5.1 Perceived importance

Mothers' perception of the significance of diarrhea prevention and management in terms of their child's health and overall well-being. Seeking medical care is a crucial aspect of maintaining one's health and addressing medical issues promptly. It involves reaching out to healthcare providers for diagnosis, treatment, and preventive care. Primary care providers, such as family doctors or internists, are often the first point of contact for routine medical care, preventive services, and initial evaluations of health concerns (50).

Urgent care centers offer immediate medical attention for non-life-threatening conditions, including minor injuries and illnesses, outside regular office hours (39). Hospital emergency rooms are equipped to handle critical and life-threatening situations, such as severe injuries, chest pain, and serious illnesses (30). Primary care providers may refer patients to specialists for specific medical conditions that require specialized evaluation and treatment (39).

Seeking regular check-ups and screenings is essential for preventive care and early detection of health issues (39). Telemedicine allows patients to consult with healthcare professionals remotely, providing access to medical advice and treatment without in-person visits (52). Health insurance coverage can significantly affect access to medical care. Understanding insurance benefits and networks is important for healthcare choices (38).

Prompt medical care is essential for addressing acute conditions, managing chronic illnesses, and preventing complications (57). Regularly scheduling and receiving recommended vaccinations is crucial for individual and public health (55). Periodic health screenings, such as mammograms, colonoscopies, and blood pressure checks, aid in early detection and prevention of diseases (56).

Individuals with chronic conditions, like diabetes or hypertension, benefit from ongoing medical care and management to control their conditions (50). Patients can actively engage in their healthcare by asking questions, seeking second opinions, and understanding their treatment options (49). In emergencies, calling 911 or local emergency services is vital for immediate medical attention (57). Accessing mental health services is crucial for individuals dealing with mental health conditions, and seeking help can improve overall well-being (53). Addressing healthcare disparities is important for ensuring equitable access to medical care for all populations (52).

2.5.2 Belief in preventive measures

Attitude towards the effectiveness of preventive measures, such as vaccination, hygiene practices, and exclusive breastfeeding, in reducing the risk of diarrhea. Belief in preventive measures is an integral component of maternal attitudes towards the prevention and management of diarrhea among mothers (46). These preventive measures encompass various actions and strategies aimed at mitigating the risk of diarrhea in children under 5 years old, rooted in knowledge and beliefs concerning the causes of diarrhea and effective prevention methods (22).

Fundamental to belief in preventive measures is the need to educate mothers about the causes of diarrhea, including the role of contaminated water sources, poor hygiene practices, and infectious

agents (46). A critical belief centers on recognizing the paramount importance of clean and safe drinking water sources. Mothers should comprehend that the utilization of contaminated water can result in waterborne infections and subsequent diarrhea (8). Mothers' belief in the significance of appropriate sanitation practices is essential. This includes understanding the safe disposal of faeces and the maintenance of clean and hygienic toilet facilities (52).

Promoting the belief in rigorous and frequent hand washing with soap and water is crucial. This practice significantly reduces the transmission of infectious agents responsible for causing diarrhea (22). Belief in the value of childhood immunization is vital to protect children from specific vaccine-preventable causes of diarrhea, such as rotavirus (46).Encouraging mothers to believe in and practice exclusive breastfeeding for the initial six months of an infant's life is pivotal. This practice provides essential nutrients and antibodies that safeguard against diarrhea (51).

Mothers should have faith in the effectiveness of ORT for treating dehydration resulting from diarrhea. It is imperative that they are knowledgeable about its preparation and administration (53). Comprehending the role of proper nutrition, including the consumption of a balanced diet, in bolstering a child's immune system is influential in shaping beliefs regarding diarrhea prevention (22). Educational programs are instrumental in aiding mothers in developing beliefs in the importance of hygiene practices. These programs empower mothers to impart these crucial practices to their children (46). Believing in the significance of promptly seeking medical care when a child experiences diarrhea is paramount. Early diagnosis and treatment are critical (46).

Fostering a belief in the value of community support and collaboration in the promotion of diarrhea prevention measures can be a potent strategy for achieving widespread adoption of these

practices (46). Recognizing and respecting the influence of cultural and social beliefs on preventive measures is indispensable. Tailoring interventions to specific communities is essential for success (22). Belief in the effectiveness and accessibility of government and healthcare initiatives pertaining to diarrhea prevention can motivate mothers to actively engage with these programs (46). Regular monitoring and evaluation of diarrhea prevention programs play a pivotal role in reinforcing beliefs in their effectiveness and fostering a culture of continuous improvement (22).

2.5.3 Trust in healthcare providers

Confidence in healthcare providers' advice and recommendations regarding diarrhea prevention and treatment. Trust in healthcare providers is a cornerstone of effective healthcare delivery and patient well-being. It involves a patient's confidence and belief in the competence, integrity, and reliability of their healthcare professionals, including doctors, nurses, and other caregivers (51). Building trust begins with healthcare providers establishing a therapeutic relationship with their patients. This involves active listening, empathy, and clear communication to understand the patient's concerns and needs (52).

Patients trust healthcare providers who demonstrate competence and expertise in their field. This includes staying updated on medical advances, providing accurate information, and making informed treatment decisions (53). Open and transparent communication is crucial for trust. Patients appreciate when healthcare providers explain diagnoses, treatment options, and potential risks in a clear and honest manner (27). Treating patients with respect and preserving their dignity fosters trust. This includes maintaining confidentiality, respecting cultural beliefs, and involving patients in decision-making (43).

Trust is reinforced when healthcare providers consistently deliver care and follow through on commitments. Patients rely on providers to be dependable and consistent in their actions (42). Involving patients in decisions about their healthcare builds trust. This collaborative approach empowers patients and ensures that their values and preferences are considered (44). Healthcare providers who show compassion and empathy are more likely to earn the trust of their patients. Understanding and validating a patient's emotions and experiences are key components of trust (43).

Being culturally competent is essential for trust in healthcare. Providers who understand and respect diverse cultural backgrounds can provide more patient-centered care (30). Trust is closely tied to the quality of care received. Patients are more likely to trust providers who deliver high-quality, effective, and safe healthcare services (53). Ensuring patient safety is paramount for trust. Healthcare providers must take measures to prevent errors, infections, and other adverse events that could erode trust (50). Upholding ethical standards is fundamental to trust. Patients expect healthcare providers to adhere to professional ethics, including honesty, integrity, and confidentiality (52).

Being accessible and responsive to patient needs is essential for trust. Patients value providers who take the time to address their concerns and are available when needed (). Healthcare providers who seek and act on patient feedback demonstrate a commitment to continuous improvement, which can enhance trust over time (51).

2.5.4 Community and Social Norms

Attitudes influenced by community beliefs and social norms related to childcare practices and diarrhea prevention. Community and social norms play a significant role in shaping behaviours,

values, and expectations within a society. These norms are the unwritten rules and shared expectations that guide individual and collective actions. Here are key points related to community and social norms. Social norms are the accepted behaviours, attitudes, and beliefs within a particular community or society (30). These norms describe what is commonly done or perceived as typical behaviour in a specific context. People often conform to descriptive norms to fit in or be accepted by their peers (29).

Injunctive norms refer to what is socially approved or disapproved behaviour. These norms dictate what is morally right or wrong within a society and can influence behaviour through social approval or disapproval (29). Social norms exert a powerful influence on individual behaviour. People tend to conform to these norms to gain social acceptance and avoid rejection (28). Social norms can vary significantly across cultures and communities. What is considered acceptable in one culture may be taboo in another, highlighting the role of cultural norms (29). Social norms can impact health behaviours. For example, community norms around smoking, alcohol consumption, or physical activity can influence individual choices in these areas (30).

Social norms often dictate traditional gender roles and expectations. Challenging and changing these norms is essential for achieving gender equality (28). Social norms can inform public policy decisions. Understanding community norms can help policymakers design interventions that align with existing beliefs and values (30). While social norms can be resistant to change, they are not fixed. Social movements and advocacy can challenge and shift norms over time, leading to societal change (29). Deviance from social norms can lead to social sanctions, including ostracism or punishment. However, sometimes deviance is necessary to challenge harmful norms and promote positive change (30).

In the context of health promotion, interventions often aim to influence social norms to encourage healthier behaviours. For example, anti-smoking campaigns may target changing the perception of smoking as a socially undesirable behaviour (42). Effective communication can influence social norms. Messaging that highlights the prevalence of a desired behaviour (descriptive norm) or underscores the importance of adhering to a positive norm (injunctive norm) can be persuasive (41). In community health initiatives, understanding and working with existing social norms is crucial. Community-based programs should consider local norms to ensure their interventions are culturally sensitive and acceptable (30).

2.5.5 Perceived self-efficacy

Belief in their own ability to carry out preventive measures effectively, such as maintaining proper hygiene or administering oral rehydration therapy. Perceived self-efficacy refers to an individual's belief in their own ability to accomplish a specific task or achieve a particular goal. This concept, introduced by psychologist Albert Bandura, plays a significant role in shaping human behaviour and motivation. Here are key points related to perceived self-efficacy. Perceived self-efficacy is the belief that one has the capabilities to execute courses of action required to deal with prospective situations (37).

Albert Bandura's social cognitive theory emphasizes the importance of self-efficacy beliefs in human agency, which refers to the capacity to influence one's own functioning and the environment (37). Self-efficacy beliefs are task-specific, meaning they relate to a particular activity or domain. For example, an individual may have high self-efficacy for public speaking but low self-efficacy for playing a musical instrument.

Perceived self-efficacy strongly influences behaviour. People with high self-efficacy are more likely to engage in challenging tasks, persist in the face of obstacles, and achieve their goals (37). Self-efficacy beliefs can be influenced by four main sources. Success in past experiences boosts self-efficacy, while failure can lower in observing others succeed can increase self-efficacy, while witnessing failure can decrease it. Encouragement and positive feedback from others can enhance self-efficacy.

Physical and emotional states, such as anxiety or stress, can influence self-efficacy. High self-efficacy can lead to a self-fulfilling prophecy where individuals approach tasks with confidence, increasing the likelihood of success. Conversely, low self-efficacy can lead to a negative cycle of avoidance and failure (18). Self-efficacy beliefs can vary across different domains of life, such as work, relationships, or health-related behaviours. In health psychology, self-efficacy plays a crucial role in influencing health behaviours. People with high self-efficacy for exercise, for example, are more likely to engage in regular physical activity (21). Interventions aimed at improving self-efficacy often involve providing individuals with the skills and experiences necessary to succeed in a particular domain. This can include education, training, and support (18).

Self-efficacy is closely related to goal setting. Setting achievable goals and believing in one's ability to attain them is a key driver of motivation (37). Cultural and contextual factors can influence self-efficacy beliefs. Social and cultural norms, as well as external support systems, can affect an individual's confidence in their abilities (24). Self-efficacy can be assessed through self-report measures, such as questionnaires or scales, which ask individuals to rate their confidence in performing specific tasks (37).

2.5.6 Barriers and Challenges

Maternal attitudes are critical in the prevention and management of childhood diarrhea. However, various barriers and challenges can impact these attitudes, affecting mothers' ability to protect their children from this preventable illness (52). Economic constraints can hinder access to essential resources and healthcare services. Mothers facing financial hardships may struggle to afford clean water sources, healthcare, or nutritious food, impacting their ability to prevent diarrhea. Challenges within the healthcare system can affect the quality and availability of healthcare services. Mothers encountering health system barriers, such as long waiting times or a lack of healthcare facilities, may become discouraged, affecting their motivation to seek medical care(50).

Cultural beliefs and social norms can influence maternal attitudes and behaviours. Deeply rooted cultural practices may contradict recommended prevention methods, causing mothers to hesitate or resist change. Limited access to education can hinder mothers' understanding of the causes and prevention of diarrhea. Mothers with lower levels of education may lack awareness about proper hygiene practices or the importance of breastfeeding, affecting their attitudes towards prevention (43).

Geographical factors, such as remote locations, can impede access to healthcare and clean water sources. Mothers in remote areas may face difficulties in accessing healthcare facilities or obtaining safe drinking water, impacting their ability to prevent and manage diarrhea. Language differences and poor communication can hinder the transfer of knowledge and information. Language barriers can lead to misunderstandings about healthcare instructions, reducing the effectiveness of diarrhea prevention efforts (42). Psychological factors such as stress or depression can affect attitudes and motivation. Mothers dealing with psychosocial issues may

struggle to prioritize preventive measures or may delay seeking care for their children when diarrhea occurs. Understanding these barriers and challenges is crucial for designing targeted interventions that address the specific needs of mothers in different contexts. Overcoming these obstacles is essential to foster positive maternal attitudes towards diarrhea prevention and management, ultimately improving child health outcomes.

2.5.7 Motivation to act

The level of motivation to take action when their child shows signs of diarrhea, including timely seeking of medical care or providing necessary care at home. Motivation plays a pivotal role in shaping the attitudes towards the prevention and management of diarrhea among mothers. In the context of maternal and child health, motivation serves as a driving force behind the adoption of preventive measures and the prompt management of diarrhea cases in young children. Here are key points that highlight the significance of motivation in this context, along with relevant in-text references. Mothers who are motivated to protect their children from diarrhea are more likely to engage in preventive measures such as promoting clean water access (42) and practicing good sanitation (41). Knowledge and awareness about the causes of diarrhea, such as contaminated water sources and poor hygiene, are foundational elements that motivate mothers to take preventive actions (41).

Motivation to provide exclusive breastfeeding for the first six months of a baby's life is essential, as breast milk contains vital nutrients and antibodies that protect against diarrhea (24). Mothers who are intrinsically motivated to provide the best possible nutrition for their infants are more likely to adhere to exclusive breastfeeding practices (38). Motivated mothers are more likely to seek medical care promptly when their child experiences diarrhea, leading to early diagnosis and treatment (20). The belief in the importance of oral rehydration therapy (ORT) in treating

dehydration caused by diarrhea is a motivating factor that encourages mothers to administer it effectively (52). Building motivation among mothers to prioritize diarrhea prevention is often reinforced by community support and cooperation (59). Communities that recognize the importance of collective motivation and action are more successful in achieving widespread adoption of preventive practices (49).

Acknowledging cultural beliefs and values is crucial when promoting motivation for preventive measures, as these factors can both facilitate and hinder adoption (37). Mothers' motivation to engage with government and healthcare initiatives related to diarrhea prevention is influenced by their belief in the effectiveness and accessibility of these programs (51). Recognizing that motivation can evolve over time, continuous efforts to educate, empower, and motivate mothers are essential for sustaining diarrhea prevention practices (45).

2.5.8 Perceived social support

Attitudes towards the support received from family members, friends, or the community in managing and preventing diarrhea. Childhood diarrhea remains a significant global health concern, particularly in low and middle-income countries (26). Mothers play a central role in the prevention and management of diarrhea among children under the age of five (27). The attitudes of mothers towards diarrhea prevention and management are influenced by various factors, including perceived social support. Family support is often regarded as one of the most influential factors in shaping maternal attitudes (30). When mothers perceive support from family members, especially spouses and extended family, their confidence in adopting preventive measures increases (27). Family support can manifest in various ways, from sharing childcare responsibilities to reinforcing the importance of clean water and hygiene practices (27).

Peer support from friends, neighbours, and other mothers within the community is another significant contributor to maternal attitudes (29). When mothers receive encouragement and practical advice from peers who endorse and practice preventive measures, they are more likely to adopt similar behaviours (28). Peer networks can create a sense of community and shared responsibility for diarrhea prevention (27).

Positive interactions with healthcare professionals, such as doctors and nurses, can greatly impact maternal attitudes (29). When mothers perceive healthcare providers as supportive and empathetic, they are more likely to seek medical care promptly when their child has diarrhea (30). Supportive healthcare providers not only provide medical treatment but also empower mothers with knowledge and resources for prevention (29). A sense of community support, where the entire community actively engages in promoting preventive behaviours, is a powerful influencer of maternal attitudes (28). Community-led initiatives, such as awareness campaigns and clean water infrastructure projects, gain momentum when mothers perceive their community as supportive (30). This can lead to increased adoption of preventive practices. In the digital age, online platforms and social media have emerged as sources of information and support for mothers (30). Engaging with online support networks and parenting forums can provide mothers with a sense of belonging and access to a wealth of information on diarrhea prevention (28). Perceived support from these virtual communities can positively influence maternal attitudes and knowledge.

2.5.9 Cultural and traditional beliefs

Attitudes influenced by cultural or traditional practices and beliefs related to diarrhea prevention and treatment, which may impact their choices and actions. Diarrhea remains a major public health concern globally, particularly among children under the age of five (30). Mothers are

central to the prevention and management of diarrhea in this vulnerable population. However, maternal attitudes towards diarrhea prevention and management are often influenced by cultural and traditional beliefs. Cultural beliefs about the causes and nature of diarrhea can significantly impact maternal attitudes. In some cultures, diarrhea may be attributed to supernatural forces or spirits (29). These beliefs can lead to practices such as seeking traditional healers or conducting rituals, delaying timely medical care (30). Understanding these cultural perceptions is crucial in addressing barriers to preventive measures.

Traditional healing practices vary widely across cultures and may include the use of herbs, rituals, or traditional medicines to treat diarrhea (37). When mothers strongly adhere to these practices, it can influence their attitudes towards modern medical interventions and timely treatment-seeking (18). Collaborative efforts should consider culturally sensitive approaches to promote both traditional and evidence-based preventive strategies (20). Religious beliefs often play a substantial role in shaping maternal attitudes. Some religious groups may have specific dietary restrictions or rituals that impact a child's diet and hygiene practices (42). Religious leaders can be influential in promoting or discouraging preventive measures, making their involvement crucial in health promotion efforts (23).

In many cultures, gender roles and decision-making power within households significantly affect maternal attitudes towards diarrhea prevention (24). Mothers may be constrained by traditional norms that limit their autonomy in decision-making, including seeking medical care for their children (42). Promoting gender equity and involving male partners in health education can be effective in shifting attitudes (37). Certain cultural taboos related to food, hygiene practices, or bodily functions can influence maternal attitudes (37). Understanding and respecting these taboos while promoting safe practices is essential to avoid resistance and foster cooperation (37).

2.6 Mother's practices towards the prevention and management of diarrhea

2.6.1 Hygiene practices

Adherence to proper hand washing, sanitation, and hygiene practices to reduce the risk of diarrheal infections, including hand washing with soap before preparing food and after using the toilet. In the pursuit of understanding effective strategies for the prevention and management of diarrhoea among mothers, it becomes evident that hygiene practices are pivotal in mitigating the risk of diarrheal diseases (51). These practices hold immense significance in safeguarding the well-being of children below the age of five. Drawing insights from various authoritative references, let us delve into the critical role of hygiene practices in this context. One of the foundational pillars of hygiene practices is proper hand washing with soap and water. This fundamental practice serves as a potent shield against diarrheal diseases, as emphasized by the World Health Organization (WHO) in their publication on Diarrhoea as a Common Illness and Global Killer (52). Through this practice, the transmission of harmful pathogens is substantially reduced, underscoring its importance, particularly among mothers residing in the Otjiwarongo District.

Access to safe drinking water and sanitation facilities emerges as an indispensable element in the prevention of diarrheal diseases (46). The maintenance of clean, functional toilets, and the assurance of safe water sources constitute cornerstones of effective hygiene practices. These measures directly contribute to reducing the risk of contamination and the subsequent incidence of diarrheal diseases. In the realm of foodborne diarrhoea prevention, the adoption of proper food hygiene practices takes center stage. Mothers must be equipped with knowledge concerning safe food handling, storage, and preparation to minimize the potential for contamination (22). This education empowers them to safeguard their children from food-related diarrheal illnesses.

Beyond individual practices, the dissemination of hygiene education through dedicated health programs is paramount (45). These initiatives serve to cultivate awareness among mothers about the critical role of hygiene in thwarting diarrhoea. By promoting good hygiene practices, these programs contribute significantly to diarrhea prevention.

An often overlooked yet vital facet of hygiene is the safe disposal of infant faeces (41). Encouraging mothers to adopt safe disposal practices is imperative in averting environmental contamination and curbing the spread of pathogens, which can be particularly detrimental to young children.

2.6.2 Exclusive Breastfeeding

Practices related to exclusive breastfeeding during the first six months of an infant's life, which can provide protection against diarrhea and other infections. In the realm of devising comprehensive strategies for the prevention and effective management of diarrhea among mothers, the subtheme of "Exclusive Breastfeeding" emerges as a central and highly impactful component. This assertion is underpinned by a wealth of robust evidence drawn from authoritative sources, reinforcing the critical importance of this practice in preserving the health and well-being of both mothers and their infants. Within the multifaceted landscape of interventions against diarrheal diseases, exclusive breastfeeding stands out as a cornerstone practice, firmly endorsed by the World Health Organization (WHO) in their comprehensive report on Diarrhoeal Disease (54). This practice is marked by its profound significance in fortifying the health of infants and shielding them from the scourge of diarrheal illnesses.

The essence of exclusive breastfeeding lies in the resolute commitment to feeding infants with nothing but breast milk during the crucial initial six months of their lives (52). This recommendation is underpinned by a deep understanding of the unparalleled benefits that breast milk offers in terms of nourishment, immunological support, and overall protection. By adhering steadfastly to this practice, mothers play a pivotal role in significantly reducing the susceptibility of their infants to diarrheal illnesses.

This approach aligns seamlessly with the broader global health agenda, epitomized by the Sustainable Development Goals (47). These goals recognize, among other things, the pivotal role of exclusive breastfeeding in the promotion of child health and well-being, emphasizing the direct link between this practice and the overarching objective of reducing child mortality and morbidity.

Incorporating exclusive breastfeeding as a fundamental subtheme within the overarching framework of strategies for the prevention and management of diarrhea among mothers is not merely a matter of strategic choice but an ethical imperative. By actively promoting and facilitating the widespread adoption of this practice, we not only empower mothers but also contribute substantially to the reduction of the incidence and impact of diarrheal diseases, thus fostering healthier and more resilient communities. In doing so, we honour the recommendations of leading health organizations and experts who tirelessly advocate for the pivotal role of exclusive breastfeeding in securing the health and future of our youngest generation.

2.6.3 Oral Rehydration Therapy (ORT)

Knowledge and utilization of oral rehydration salts (ORS) or homemade ORT solutions to manage dehydration caused by diarrhea. In the endeavour to develop a comprehensive strategy

for the prevention and management of diarrhea among mothers, the subtheme of Oral Rehydration Therapy (ORT) emerges as a critical component, substantiated by compelling evidence from authoritative sources.

Oral Rehydration Therapy (ORT) plays a pivotal role in addressing dehydration caused by diarrhea, and it is well-documented by the World Health Organization (WHO) as a cornerstone in the management of diarrheal diseases (54). This therapy entails the oral administration of a specially formulated solution containing a precise balance of electrolytes, such as sodium and potassium, glucose, and water, to restore fluid and electrolyte balance in the body.

ORT is a fundamental intervention that is highly effective in treating dehydration resulting from diarrhea, particularly in resource-limited settings where access to advanced medical care may be limited (54). The inclusion of ORT in healthcare practices can significantly reduce the risk of severe dehydration, hospitalization, and mortality, especially among mothers and their infants. Furthermore, ORT aligns with the global health initiatives outlined in the Sustainable Development Goals (47), emphasizing the importance of accessible and affordable healthcare interventions. It complements the broader strategy for diarrhea prevention and management, highlighting its relevance in ensuring the well-being of mothers and children.

2.6.4 Appropriate Nutrition

Practices related to providing a balanced and nutritious diet to children, which can strengthen their immune system and reduce the risk of diarrhea. Appropriate Nutrition stands out as a crucial subtheme in the multifaceted approach to practices towards the Prevention and Management of Diarrhea among mothers, supported by a wealth of information from reputable sources. Proper nutrition is essential for maintaining overall health and plays a pivotal role in

preventing and managing diarrheal diseases among mothers, as emphasized by the World Health Organization (WHO) in their report on Diarrhoeal Disease (52). Adequate nutrition ensures that mothers have the necessary nutrients and a strong immune system to resist infections and recover swiftly in the event of illness.

In the context of diarrhea prevention and management, a well-balanced diet is integral in boosting immunity, which, in turn, helps mothers fend off pathogens that can cause diarrheal illnesses (51). A diet rich in essential nutrients, such as vitamins and minerals, can fortify the body against infections and contribute to a quicker recovery should diarrhea occur.

Furthermore, Appropriate Nutrition dovetails with broader global health objectives like the Sustainable Development Goals (47), which highlight the significance of good health and well-being for all. A well-nourished population is better equipped to combat diseases, promoting the well-being of mothers and their families.

2.6.5 Timely Healthcare Seeking

The promptness with which mothers seek medical care for their child when they exhibit symptoms of diarrhea, such as dehydration or persistent diarrhea. Timely Healthcare Seeking emerges as a crucial subtheme in the context of Practices Towards the Prevention and Management of Diarrhea among mothers, as highlighted by authoritative sources. Timely healthcare seeking is pivotal in addressing diarrheal diseases among mothers, as emphasized by the World Health Organization (WHO) in their report on Diarrhoeal Disease (52). Seeking prompt medical attention can lead to early diagnosis and appropriate treatment, which is essential in preventing the escalation of diarrhea and its potential complications.

The significance of timely healthcare seeking is underscored by UNICEF in their publication "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46), which highlights the urgency of seeking healthcare for diarrhea, especially in children, to prevent fatalities. This principle applies equally to mothers who are susceptible to the effects of diarrheal diseases. Furthermore, integrated global action plans, such as the Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD) by (45), stress the importance of timely healthcare seeking as a fundamental component of effective prevention and management strategies.

In the context of the Sustainable Development Goals (47), timely healthcare seeking aligns with the broader objective of ensuring good health and well-being for all, emphasizing the importance of access to healthcare services and prompt intervention.

In conclusion, Timely Healthcare Seeking is a critical subtheme within the overarching strategy for preventing and managing diarrhea among mothers. It emphasizes the need for mothers to seek healthcare promptly when experiencing symptoms of diarrhea, aligning with global health objectives and recommendations from authoritative sources to ensure their well-being and that of their families.

2.6.6 Vaccination

Adherence to vaccination schedules, including rotavirus vaccination, which can prevent specific types of diarrheal diseases. Vaccination plays a crucial role in the subtheme of Practices towards the Prevention and Management of Diarrhea among mothers, as highlighted by authoritative sources. Immunization against diseases that can cause diarrhea is a key component of preventing diarrhea among mothers, as emphasized by the World Health Organization (WHO) in their report

on Diarrhoeal Disease (52). Vaccines protect against various pathogens, such as rotavirus, which is a leading cause of severe diarrhea in children and can also affect adults, including mothers.

The importance of vaccination in preventing diarrheal diseases is further underscored by UNICEF in their publication "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46). This resource emphasizes the role of vaccines in reducing the incidence and severity of diarrhea, thereby preventing deaths among children and adults, including mothers. Vaccination against diarrheal diseases is in alignment with global health goals, as outlined in the Sustainable Development Goals (47). Achieving universal immunization coverage contributes to the broader objective of ensuring good health and well-being for all.

2.6.7 Use of Safe Water

Practices related to ensuring access to safe and clean drinking water sources, as contaminated water is a common cause of diarrhea. The use of Safe Water is a vital subtheme in the context of Practices towards the prevention and management of Diarrhea among mothers, and this approach is supported by numerous authoritative sources.

Access to safe drinking water is fundamental in preventing diarrheal diseases among mothers, as highlighted by the World Health Organization (WHO) in their fact sheet on Diarrhoeal Disease (52). The provision of safe water sources can significantly reduce the risk of diarrheal infections, which is especially critical for maternal health. Ensuring access to safe water aligns with the recommendations of UNICEF's publication "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46). Clean and safe water is a fundamental component of preventing diarrhea not only among children but also among mothers and adults in general.

The importance of safe water is embedded in global health goals, as outlined in the Sustainable Development Goals (47). The availability of safe drinking water contributes to the broader objective of ensuring good health and well-being for all, including mothers.

2.6.8 Safe Food Handling

Proper handling, storage, and cooking of food to prevent foodborne illnesses that can lead to diarrhea. Safe Food Handling is a crucial subtheme in the context of Practices towards the Prevention and Management of Diarrhea among mothers, and it is supported by authoritative sources. Safe food handling practices are vital to prevent diarrheal diseases among mothers, as emphasized by the Centers for Disease Control and Prevention (CDC) in their guidelines on Diarrhea (8). Ensuring that food is properly prepared, stored, and cooked can prevent contamination and the subsequent risk of diarrheal infections. The importance of safe food handling is highlighted by the World Health Organization (WHO) in their fact sheet on Diarrhoeal Disease (52). Contaminated food is a significant source of diarrheal pathogens, making safe food practices a critical component of preventing diarrhea among mothers and their families.

UNICEF's report, "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46), emphasizes that proper food handling and hygiene practices play a pivotal role in reducing diarrheal diseases, not only among children but also among mothers and adults in general.

Promoting safe food handling aligns with the broader goal of ensuring good health and well-being for all, as outlined in the Sustainable Development Goals (47). Ensuring food safety contributes to maternal health and the overall well-being of communities.

2.6.9 Treatment Adherence

Consistency in following prescribed treatments and medications, such as antibiotics or ant-parasitic drugs, when diarrhea is caused by specific pathogens. Treatment Adherence is a crucial subtheme within the context of Practices towards the prevention and management of Diarrhea among mothers, as supported by various reputable sources. The World Health Organization (WHO) underscores the significance of treatment adherence in the prevention and management of diarrheal diseases (52). Adhering to prescribed treatments, such as oral rehydration therapy and medication, is vital for mothers to recover and prevent complications.

UNICEF's report, "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46), emphasizes the need for mothers to follow treatment protocols to ensure their own well-being while caring for their children. Treatment adherence among mothers can lead to quicker recovery and reduced transmission of the disease. The Centers for Disease Control and Prevention (CDC) emphasizes the importance of adherence to treatment plans to manage diarrhea effectively (8). Ensuring that mothers adhere to recommended treatments is crucial in preventing severe dehydration and complications.

Promoting treatment adherence aligns with broader global health goals, including the Sustainable Development Goals (47). Ensuring that mothers adhere to treatment plans contributes to maternal health and supports the overall well-being of communities.

2.6.10 Awareness of Warning Signs

Knowledge of and adherence to recognizing warning signs of severe diarrhea, such as bloody stools or high fever, and taking appropriate action. Awareness of Warning Signs is a critical subtheme within the context of Practices towards the Prevention and Management of Diarrhea

among mothers. This theme highlights the importance of mothers being informed about the warning signs of diarrhea and related complications. Numerous reputable sources support this subtheme:

The World Health Organization (WHO) emphasizes the significance of recognizing warning signs associated with diarrhea, such as severe dehydration and persistent symptoms (52). Early identification of these signs is crucial for timely intervention. UNICEF's report, "Diarrhea: Why Children Are Still Dying and What Can Be Done" (46), stresses the need for mothers to be aware of danger signs in their children and themselves, ensuring they seek medical care promptly when necessary.

The Centers for Disease Control and Prevention (CDC) underline the importance of recognizing symptoms like high fever, blood in stool, and reduced urination, which may indicate severe cases of diarrhea (8). Mothers should be educated on these signs for early intervention. The Sustainable Development Goals (47) emphasize the importance of maternal health. Awareness of warning signs contributes to maternal well-being and aligns with broader global health objectives.

2.6 Chapter summary

In this chapter, the study delved into the theoretical framework that underpinned the study and provided a comprehensive conceptualization of diarrhea within the context of the research. Diarrhea, as a multifaceted health concern, required a nuanced understanding that encompassed various dimensions, from its aetiology to its social and economic implications. As the study embarked on this scholarly journey, the research objectives guided the exploration. The study sought to assess the general knowledge possessed by mothers regarding diarrhea, its origins,

preventive measures, and management strategies. Additionally, the study aimed to delve into the attitudes that mothers harboured concerning the prevention and management of diarrhea. These attitudes, shaped by a multitude of factors, played a crucial role in influencing maternal behaviours.

Within this literature review chapter, the study embarked on a rigorous and systematic examination of the existing body of knowledge. By critically appraising previous studies, the study aimed to build upon prior insights, identify gaps in the literature, and establish a robust foundation for research endeavours. This literature review served as the intellectual compass that guided the understanding, informed the research methodology, and contributed to a more comprehensive analysis of the complex interplay between mothers knowledge, attitudes, practices, and the prevalence of diarrhea among young children.

CHAPTERS THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter 2 of the study explored into the extensive review of relevant literature. Numerous scholars' works were thoroughly examined, with the primary objective of understanding their contributions to the research topic and addressing the sub-research questions derived from the overarching research query. This review entailed an exploration of their arguments, areas of consensus, divergences in viewpoints, and, significantly, the identification of gaps within the discourse and their findings. The focal point of this chapter transitions towards elucidating the research methodology employed in this study. As elucidated by (56), research methodology encompasses the systematic approach used to acquire and gather data for a research project. It serves as the architectural framework governing the collection, measurement, and subsequent analysis of data, all aimed at realizing the objectives of the research endeavor. The significance of research methodology cannot be overstated, as it meticulously outlines the sampling strategy, defines the target population, and articulates the chosen sampling techniques. Furthermore, it offers insights into the rationale behind the selection of a specific target population. The chapter also provided a comprehensive description of the data collection methods employed by the researcher.

This segment of the study exhaustively explored the methodologies and techniques utilized for data collection, delineating the specifics of where, when, and from whom data was sourced, along with a clear exposition of the sample size employed. Additionally, it encompassed the

research design and plan, considerations of the population and sample, insights into the instruments employed for data collection, the sources tapped for data acquisition, and the methodologies employed for data analysis. The discussion also delved into the reliability and validity of the collected data, essential for establishing the credibility of the study's findings, while also candidly addressing any constraints and challenges encountered during the data collection process. Lastly, ethical considerations pertinent to research were thoughtfully taken into account.

3.2 Research philosophy

A research paradigm serves as the foundational framework that shapes every aspect of a research study, from its philosophical underpinnings to the methodologies employed. It encompasses the researchers' ontological and epistemological beliefs, as well as the methodological choices they make, providing a guiding philosophy for conducting and interpreting research (3). In the context of our study, titled "Knowledge, Attitude, and Practices towards the Prevention and Management of Diarrhea among Mothers of Children under 5 Years in Otjiwarongo District, Namibia," it's essential to assess the suitability of the positivist research paradigm. Drawing insights from selected sources, we can evaluate how well the positivist paradigm aligns with the objectives and nature of our research:

The positivist paradigm, as supported by Creswell and Neuman, is inherently quantitative in nature. It thrives in studies that employ structured surveys and questionnaires to quantify phenomena (31). Given that our study seeks to assess knowledge levels, attitudes, and practices among mothers, this aligns well with the positivist approach. We aim to gather numerical data to gain quantifiable insights into maternal behaviours and perceptions related to diarrhea.

Positivism places a strong emphasis on generalizability, as highlighted by Neuman (31). In our study, if we intend to make broader inferences about the population of mothers with young children beyond Otjiwarongo District, the positivist approach is advantageous. By utilizing a representative sample and rigorous statistical methods, we can extend our findings to a larger population. The positivist paradigm's commitment to objective measurement and the establishment of causal relationships through systematic data collection and analysis is valuable (5). This aligns with our aim to identify factors associated with diarrhea incidence among children under five years in a structured and rigorous manner. Positivism is well-suited for studies that involve statistical data analysis techniques (31). In our research, these techniques can help us uncover correlations and associations between variables, providing valuable insights into the relationships between maternal knowledge, attitudes, practices, and diarrhea prevalence.

3.3 Research approach

Quantitative research is a systematic empirical approach to research that seeks to gather numerical data and utilize statistical analysis to quantify and measure phenomena, relationships, and variables within a study (31). This approach emphasizes objectivity, precision, and the generation of numerical evidence to draw conclusions and make inferences. In the context of our study, titled "Knowledge, Attitude, and Practices of mothers on the Prevention and Management of Diarrhea in children Under five Years in Otjiwarongo District, Otjozondjupa region, Namibia," the suitability of quantitative research is notable. The selected method aligns well with the study's objectives and nature.

This study aims to assess mothers knowledge, attitudes, and practices related to diarrhea prevention and management. Quantitative research, as defined by (31), excels in precisely measuring and quantifying such variables. Through structured surveys and questionnaires, the

study can systematically gather numerical data that allow the researcher to assess the extent of mothers' knowledge, their attitudes, and their practices in a quantifiable manner. Quantitative research methods are known for their ability to conduct rigorous statistical analyses (20). In this study, this analytical approach is invaluable. By employing statistical techniques, the study can identify patterns, correlations, and associations within the data. For instance, the study can determine whether there are statistically significant relationships between specific mother practices and diarrhea incidence among children under 5 years.

3.4 Research design

Cross-sectional survey design is a research methodology characterized by the collection of data from a sample of individuals or entities at a single point in time, with the primary aim of gathering information about a specific set of variables or characteristics (11). This approach allows researchers to capture a "snapshot" of a population's attributes or behaviours at a particular moment (3). The Cross-Sectional Survey Design is well-suited to the objectives and scope of our study, "Knowledge, Attitude, and practices of mothers on the prevention and management of diarrhea in children under five Years in Otjiwarongo District, Otjozondjupa region, Namibia." Here's a discussion of its appropriateness:

This study seeks to assess mothers knowledge, attitudes, and practices regarding diarrhea prevention and management. A cross-sectional survey is highly suitable for this purpose as it allows us to collect data from a representative sample of mothers in Otjiwarongo District at a single point in time (3). This "snapshot" approach permits us to gauge the current status of mothers knowledge and practices in the region. Cross-sectional surveys are generally efficient and cost-effective, especially when compared to longitudinal designs that involve multiple data

collection points over time (3). Given the likely constraints on resources and time, our study can benefit from the practicality of a one-time data collection effort.

However, it's essential to acknowledge that cross-sectional surveys have limitations. They provide a snapshot but cannot capture changes or developments over time. Additionally, causality cannot be established, as it's challenging to discern whether knowledge, attitudes, or practices are causing specific outcomes. To address these limitations, researchers might consider complementing the cross-sectional survey with other research methods, such as qualitative interviews or longitudinal studies.

3.5 Population

A population refers to the whole group of people or objects that the researcher is interested (14). In this study, the study population consisted of all mothers of children less than five years attending Ombili health post, Orwetoveni clinic, Etunda Clinic and Kalkveld clinic during data collection period and whose children have or had diarrhea episode in the past three months prior to the time of the study. The total population consists of 14891 mothers.

3.5.1 Inclusion criteria

All mothers attending at Ombili health post, Orwetoveni clinic, Etunda clinic and Kalkveld clinic whose children are under five years and have or had diarrhea in the past three months prior to the time of the study.

3.5.2 Exclusion criteria

All mothers of children under five years attending at Ombili health post, Orwetoveni clinic, Etunda clinic and Kalkfeld clinic whose children have or had diarrhea in the past three months who are not willing to participate in the study and mothers of children under five years with diarrhea but are critically sick and need urgent referrals.

3.6 Sample and sampling procedures

3.6.1 Sample size

The sample size for this study will be calculated using Yamane formula (1967)

$$n = \frac{N}{1+\propto^2 N}$$

Whereby n= Sample size

N= total population of mothers of child bearing age

$\propto^2$= desired confidence interval level 95%

Thus $n = \frac{14891}{1+0.05^2*(14891)}$

$= \frac{14891}{38.2275}$

= 389.536

= 390 participants

Therefore, minimum of (390) mothers with children less than 5 years are required for the study,

Simple random sampling is a fundamental method of probability sampling used in research. It involves selecting a subset (sample) from a larger population in such a way that each member of

the population has an equal and independent chance of being included in the sample (40). This method typically uses random number generators or drawing lots to ensure the randomness of selection. Simple random sampling can be a suitable sampling technique for the current study, "Knowledge, Attitude, and Practices towards the Prevention and Management of diarrhea among mothers of children under 5 Years in Otjiwarongo District, Namibia." Here's a discussion of its appropriateness:

Simple random sampling ensures that each mother in Otjiwarongo District has an equal chance of being included in the study (40). This helps in creating a sample that is likely to be representative of the entire population, making it possible to generalize the findings to all mothers with young children in the district. This method reduces selection bias because every mother has an equal probability of being selected (40). It minimizes the risk of inadvertently favoring or excluding particular groups, leading to more accurate and unbiased results.

Simple random sampling facilitates the application of statistical methods for data analysis (40). Since our study involves quantitative data collection and analysis to assess knowledge, attitudes, and practices, this sampling approach aligns well with the statistical techniques we plan to employ. In cases where resources and time are limited, simple random sampling is often more practical than other sampling methods (40). It's relatively straightforward to implement, especially when dealing with a finite and accessible population like mothers in a specific district.

In this study, simple random sampling was used to select 390 individuals randomly at the Ombili health post, Orwetoveni clinic, Kalkveld clinic and Etunda clinic. Respondents were selected randomly as they come to the above mentioned health facilities depending on their willingness to participate in the study. A random lottery simple random sampling method was used whereby

papers written numbers from one to five were stored in a box. Random numbers were selected by pulling out a paper from the box without looking at it and all individuals who selected numbers two and four were given questionnaires for the study. Questionnaires were provided to the mothers of children under five years to obtain data in order to draw conclusion about the knowledge, attitudes and practices of mothers of children under five years towards the prevention and management of diarrhea in Otjiwarongo district, Otjozondjupa region.

3.7 Research instruments

3.7.1 Closed ended questionnaire

A closed-ended questionnaire is a structured survey instrument consisting of questions that provide respondents with a predefined set of response options (3). In other words, respondents choose their answers from a list of predetermined categories, such as multiple-choice questions or Likert scale items. This type of questionnaire is characterized by its standardized format, which ensures that all respondents are presented with the same set of response choices, facilitating quantitative data collection and analysis. The questionnaire was designed by the researcher and was adopted and modified from related articles for this study. A close- ended questionnaire was developed for data collection from mothers of children under five years who have agreed to participate in the study through informed consent. A close ended questionnaire was developed in English and translated to Oshindonga by the researcher, however for those who were unable to read and write either of the languages, the questions were read to them and their responses were recorded in the questionnaire by the researcher and nurses.

The suitability of using a closed-ended questionnaire in the context of the current study, which investigates "Knowledge, attitude, and practices of mothers on the Prevention and Management

of diarrhea in children Under five Years in Otjiwarongo District, Otjozondjupa region, Namibia," has been discussed. Closed-ended questionnaires offer advantages such as quantifiability, consistency, efficiency, and ease of data analysis, making them well-suited for assessing maternal knowledge and practices related to diarrhea. However, researchers must also consider their limitations, including restricted response options, the potential for response bias, and the inability to explore complex issues in depth. Complementing the closed-ended questionnaire with qualitative methods or open-ended questions can help address these limitations and provide a more comprehensive understanding of maternal attitudes and practices concerning diarrhea prevention and management.

3.8 Data analysis

Pilot study The current study utilized the Statistical Package for the Social Sciences (SPSS) software for the analysis of data. SPSS is a powerful tool for both descriptive and inferential statistical analysis, providing researchers with a wide range of statistical techniques to explore and interpret their data. In the context of this study on "Knowledge, attitude, and practices towards the Prevention and Management of diarrhea among mothers of children under 5 Years in Otjiwarongo District, Namibia," various descriptive and inferential statistics was employed.

Descriptive statistics like the mean (average), median (middle value), and mode (most frequent value) was used to summarize central tendencies in the data. For instance, calculating the mean knowledge score of mothers regarding diarrhea prevention. Descriptive statistics such as the range, variance, and standard deviation might have been employed to assess the spread or variability in data. This could be useful in understanding how attitudes or practices related to diarrhea management vary among mothers. Creating frequency distributions and histograms for categorical variables can provide an overview of the distribution of responses. For example,

examining the frequency of different attitudes toward diarrhea prevention. Percentages: Calculating percentages can help express the proportion of respondents who fall into specific categories or have particular knowledge levels.

Chi-Square Test: This statistical test is used to examine associations or relationships between categorical variables. It could was applied to investigate whether there is a significant association between mothers' knowledge levels and their preventive practices regarding diarrhea. Independent Samples t-test: If there are two groups to compare, knowledge scores between mothers with and without access to healthcare facilities, the independent samples t-test can determine if there is a statistically significant difference.

When dealing with more than two groups, ANOVA was used to determine whether there are statistically significant differences among these groups. For example, assessing if there are significant differences in knowledge scores among mothers of different educational levels. Correlation coefficients (e.g., Pearson's correlation) was used to examine the strength and direction of relationships between continuous variables. The correlation coefficient was applied to establish the correlation between maternal attitudes and their reported practices in diarrhea management. Regression models, such as linear regression or logistic regression, was used to predict outcomes based on predictor variables. In this study, it might be used to predict maternal practices based on their knowledge and attitudes. Analysis of Covariance (ANCOVA): If the study needs to control for covariates (e.g., age, socioeconomic status), ANCOVA allows researchers to assess the impact of an independent variable on a dependent variable while controlling for covariates.

3.9 Pilot study

The study questionnaire underwent a preliminary pilot phase, which was conducted at clinic A. During this pivotal pilot study, a total of 30 participants were actively engaged to evaluate and refine the questionnaire's effectiveness and suitability for the larger research endeavor. This initial testing phase aimed to gather valuable insights into the questionnaire's clarity, comprehensibility, and overall functionality, ensuring that it would serve as a robust tool for the subsequent research investigation.

3.10 Study setting

The study was conducted in the Otjiwarongo District, located within the Otjozondjupa Region of Namibia. This district was characterized by a mix of urban and rural communities, providing a diverse backdrop for exploring health-related behaviors. The region faced challenges typical of many developing areas, including limited access to healthcare services, variations in socioeconomic status, and differing levels of education among residents. These factors contributed to varied approaches to health management, particularly among mothers responsible for the care of young children.

The focus was on female-headed households with children under five years of age, as these households often dealt with unique challenges that could impact health practices and outcomes. By targeting this specific demographic within the Otjiwarongo District, the study aimed to gather insights that were both representative and specific to the local context. This involved engaging with local healthcare facilities and utilizing community centers to facilitate data collection and participant interaction, ensuring that findings were relevant and applicable to improving child health interventions in the area.

3.11 Data collection procedure

The data collection session commenced with a brief explanation of the aim of the study as well as confidentiality issues. A random lottery simple random sampling method was used whereby papers written numbers from one to five were stored in a box. Random numbers were selected by pulling out a paper from the box without looking at it and all individuals who selected numbers two and four were given questionnaires for the study The researcher provided the questionnaire to the respondents and the respondents wrote down their answers in response to the questions printed in the questionnaire document. The questionnaires was given to the participants at clinic A, clinic B, clinic C and clinic D consulting rooms to ensure privacy, it happened during working hours and it took approximately 25 minutes depending on the respondents' answers. After the respondents have finished filling in the questionnaire, the questionnaire was left with the researcher and the respondents were appreciated for their time. The researcher supervised data collection and check completeness of the collected questionnaires. In this study, simple random sampling was used to select 390 individuals randomly at clinic A, B, C and D. Respondents were selected randomly as they come to the above mentioned health facilities depending on their willingness to participate in the study. Questionnaires were provided to the mothers of children under five years to obtain data in order to draw conclusion about the knowledge, attitudes and practices of mothers of children under five years towards the prevention and management of diarrhea in Otjiwarongo district, Otjozondjupa region.

3.11 Validity and Reliability

Validity and reliability are crucial concepts in research methodology that help ensure the quality and accuracy of research findings.

3.11.1 Validity

Validity refers to the extent to which a study accurately measures or assesses what it claims to measure. It is about the truthfulness or credibility of the study's results (34). The questionnaire used in the study was developed with input from experts in the field. Their feedback and expertise helped ensure that the questions were relevant and comprehensive in assessing the variables under investigation. Statistical techniques such as factor analysis were employed to confirm that the questionnaire items indeed measured the intended constructs or variables (44). To establish this type of validity, the researcher compared the results of the questionnaire to a gold standard or another validated instrument measuring the same constructs (56). This allowed the researcher to assess how well the questionnaire correlated with established measures. The questionnaire was also reviewed by a panel of potential respondents to confirm that it appeared to measure what it was supposed to measure in a straightforward manner.

3.11.2 Reliability

Reliability refers to the degree to which a study's results can be replicated or repeated consistently. It is about the consistency or stability of the measurements. In our study, reliability was addressed in the following ways: We used Cronbach's alpha to measure the internal consistency of the questionnaire items (36). A high Cronbach's alpha indicates that the items in the questionnaire consistently measure the same underlying construct. To assess the stability of our measurements over time, the study administered the questionnaire to a subset of participants on two separate occasions and examined the correlation between the two sets of responses (35).

3.12 Ethical Considerations

According to (60) ethics are defined as a set of moral principles that are suggested by an individual or groups, which are subsequently widely accepted. Research ethics are focused on

what is morally accepted or not accepted when engaging with the research participants or when accessing archival data **(60).** Ethics should be applied at all stages of research, whether it is planning, data collection, and evaluation and reporting of the research findings. The four basic ethical principles are autonomy, beneficence, non-malfeasance, and justice. Some of the facets of ethical researching which was applied by the researcher are as follows:

3.12.1 Permission to Conduct Research.

Ethical clearance was obtained from the university of Namibia Decentralized ethics committee (appendix 1), Furthermore permission to conduct research was obtained from Ministry of health and social services and Otjozondjupa Regional director. Data was not collected until such written permission was granted to the researcher.

3.12.2 Informed consent

Informed consent means that the purpose of the research was explained to the participants, including what their role would be and how the trial worked (30). The participants signed informed consent forms and had the opportunity to ask questions, understanding their roles in the study. Obtaining consent required open and honest communication between the researcher and the participant.

3.12.3 Anonymity and confidentiality

For anonymity and confidentiality, the researcher did not use the real names of the participants, but set up a consent form for participants to sign which shows that they agreed to participate in the study. The consent form explained the purpose of the research and also informed the participants of the right to refuse partaking in or withdrawing from the study without any negative consequences. When referring to certain places, the researcher made use of pseudonyms or code the names of the areas of concern where necessary, to make sure that they were not to expose the participants in anyway but to be more of a general knowledge of the area.

Furthermore, the questionnaires will only used by the researcher and the supervisor. The data that is collected will be kept for 3 years and then get disposed of either by burning or by any other method that the University of Namibia might deem fit. To ensure safety for the student researcher, all questionnaires and observations were done under the supervision of the researcher which was guided and was kept confidential in the personal safety place to be locked with personal keys only accessed by the researcher.

3.12.4 Non-maleficence

Ethics refers to the part of human philosophy concerned with appropriate conduct and virtuous living (Mingaine, 2013).Ethics involves the entire research process from the nature of the problem under investigation, reporting the theoretical framework underpinning the study, the research context, and data collection instruments and methods being utilised, the research participants involved and the procedures used to analyse the data (21).This study involved human subjects and as such, special precautions were taken to protect the rights of these human beings. Researcher ensured that no harm placed on the participants because of the research. This was ensured before, during and after the research. Data was collected through an in-depth questionnaire filed and kept safe therefore the researcher did not foresee any harm.

To uphold the principle of beneficence or “doing what is good”, Blaikie (21) suggest that the main aim of the researcher should be to produce results which was beneficiary to the individuals and the entire society at large. Apart from that, consideration for the potential for harm among the participants was also observed. The study involved human participants therefore clear and careful elucidation of the risks and benefits of the study was made clear to the participants prior to the study. A clear measure of whether the risks involved would outweigh the benefits was made.

3.12.5 Justice

The principle of justice includes the participant's right to fair treatment and privacy (Gupta & Gupta, 2011). This fair treatment prevailed before, during and after their participation in the research study. Furthermore, participants were treated with respect and dignity and were always free to ask the researcher for clarity on where they did not understand; and should they wish to withdraw from the study there should be non-prejudicial treatment.

3.13 Chapter summary

This chapter has presented definitions of the key research methods, and outlined the relevant research instrument. The most suitable instrument for data collection was presented. The philosophy, research strategies and sampling method for this study were also discussed and justified. Data analysis, validity and reliability of the research instrument and limitations of the research were also discussed. The chapter also discussed how bias was eliminated and ethical considerations in the study. The next chapter focuses on the presentation of data and research findings as well as analysis and discussion of data in detail.

CHAPTERS FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

Chapter Four of this study is devoted to the exposition of the insights acquired in relation to the research inquiries delineated in Chapter One. The main aim of this chapter is to thoroughly analyze the knowledge, attitudes, and actions demonstrated by mothers about the prevention and management of diarrhea. In addition, the researcher aims to investigate the factors that are inherently associated with the prevalence of diarrhea in children below the age of five who reside in the Otjiwarongo District of the Otjozondjupa Region in Namibia. The current chapter exhibits a well-defined structure, comprising many components that collectively shed light on key aspects of the inquiry. The researcher adeptly navigates between these many components in order to offer a thorough comprehension of the research findings. The analysis of maternal comprehension pertaining to diarrhea, comprising its aetiology, prevention measures, and management options, provides valuable insights into the collective knowledge level of mothers. Following this, the researcher explores the attitudes held by mothers in relation to the prevention and management of diarrhea, uncovering views, beliefs, and feelings that could potentially impact their behaviours in this domain. The chapter directs attention towards practical considerations by outlining the diverse activities that participants described, encompassing cleanliness routines, dietary practices, and healthcare-seeking behaviours. The researcher conducts a thorough evaluation of the correspondence between the knowledge possessed by moms and the specific behaviours they utilize.

This chapter assess knowledge, attitudes and practices of mothers on the prevention and management of diarrhea in children under five years, Otjiwarongo district, Otjozondjupa region,

Namibia. These correlations can be substantiated by the utilization of statistical analysis. Through conducting a comparative analysis and interpreting study findings, this chapter provides a comprehensive viewpoint on the influence of mothers' knowledge, attitudes, and activities on the health of their children. Furthermore, the researcher carefully considers how the elements that have been discovered as contributing to diarrhea can provide valuable insights for informing future public health initiatives.

4.2 Biographical information of the respondents

The participants in this study were mothers residing in the Otjiwarongo District of the Otjozondjupa Region in Namibia. These mothers were selected as the primary focus group due to their central role in childcare and their influence on the health and well-being of children under the age of five, particularly in the context of diarrhea prevention and management. Before delving into the research findings, it is essential to introduce the biographical information session. In this session, the researcher collected key demographic data and background information about each participating mother. This step was crucial for understanding the diverse socio-cultural context within which the study was conducted and for identifying any potential demographic factors that might be associated with knowledge, attitudes, and practices related to diarrhea prevention and management.

4.2.1 Residential area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	102	26,2	26,2	26,2
	Rural	288	73,8	73,8	100,0
	Total	390	100,0	100,0	

The data indicates that the majority of respondents (73.8%) reside in rural areas, while 26.2% live in urban areas. This information is important for understanding the demographic composition of your study or survey. The significant difference in the number of respondents from urban and rural areas suggests that there might be variations in experiences, lifestyles, and access to resources between these two groups. It's common to find disparities in areas like healthcare, education, and infrastructure between urban and rural settings, which could be explored further in your study.

4.2.2 Age of the mother at first conception

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-24	110	28,2	28,2	28,2
	24-34	138	35,4	35,4	63,6
	35-44	101	25,9	25,9	89,5
	>44	41	10,5	10,5	100,0
	Total	390	100,0	100,0	

This age distribution is vital as it can impact the way mothers perceive and manage diarrhea in their children. As supported by the American Academy of Paediatrics (1), the age of the caregiver can influence their understanding of paediatric health issues. Moreover, the United Nations Children's Fund (UNICEF) has emphasized the importance of understanding the age demographics of caregivers in child health research, as different age groups may have varying access to healthcare information and resources (43). The significant presence of mothers in the 24-34 age group aligns with studies such as the Namibia Demographic and Health Survey 2018 (26) which often focuses on this age group as it represents a critical phase in child-rearing.

4.2.3 Rota virus vaccine received

Rota virus vaccine		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	119	30,5	30,5	30,5
	No	271	69,5	69,5	100,0
	Total	390	100,0	100,0	

The data indicates that 30.5% of respondents answered "Yes" when asked if they have knowledge on rota virus vaccine, while 69.5% answered "No." This finding is significant as it reflects the level of knowledge about diarrhea prevention among mothers of children under five years in the Otjiwarongo District. It's crucial to assess this knowledge level, as it directly influences preventive practices. This result aligns with studies on mothers knowledge and health

practices, such as research conducted by the American Academy of Pediatrics (1) on the importance of caregivers' knowledge in managing pediatric health issues.

Research by UNICEF (45) emphasizes the need for increased knowledge about diarrhea prevention to reduce child morbidity and mortality. This aligns with the finding that a significant portion of respondents lacks knowledge. Additionally, you can refer to research on the Global Burden of Disease Study (14) for global context regarding the impact of diarrhea on child health and the importance of prevention through knowledge.

4.2.4 Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	124	31,8	31,8	31,8
	Married	84	21,5	21,5	53,3
	Divorced	44	11,3	11,3	64,6
	Widowed	138	35,4	35,4	100,0
	Total	390	100,0	100,0	

The data shows a diverse distribution of marital status among the respondents: 31.8% are single, 21.5% are married, 11.3% are divorced, and 35.4% are widowed. The marital status of mothers is an essential demographic factor that can influence various aspects of child-rearing and healthcare practices. The variation in marital status suggests that different groups may have distinct experiences and challenges when it comes to managing diarrhea in their children. This

aligns with research on family dynamics and health practices, such as studies by the American Academy of Paediatrics (1) emphasizing the role of caregivers in pediatric healthcare.

The American Journal of Tropical Medicine and Hygiene (2) may highlight the significance of family and marital dynamics in influencing health behaviors and practices, especially in rural settings. The findings are consistent with the data distribution, where a significant percentage of respondents are widowed, and may require additional support and resources (43).

4.2.5 Mothers occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Housewife	179	45,9	45,9	45,9
	Government or non-governmental employee	152	39,0	39,0	84,9
	Self- employed	59	15,1	15,1	100,0
	Total	390	100,0	100,0	

The data reveals that respondents have varying employment statuses: 45.9% are housewives, 39.0% are government or non-governmental employees, and 15.1% are self-employed. The employment status of mothers is an important factor that can influence their access to resources, time availability, and knowledge about healthcare practices, including diarrhoea prevention and management. For instance, being a housewife might allow more time for child care, while being

employed could impact access to healthcare resources. This aligns with the idea that different employment statuses can affect healthcare practices, which is discussed in research like the (1).

Research by the World Health Organization (51) emphasizes the need for accessible healthcare for all, regardless of employment status. Additionally, the role of housewives and caregivers in child health is discussed in studies by UNICEF (43). These findings align with the data distribution and suggest that employment status may play a significant role in healthcare practices and resources.

4.2.6 Mothers motherly income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<N$1000	204	52,3	52,3	52,3
	N$1000- 3000	123	31,5	31,5	83,8
	N$ ≥3001	63	16,2	16,2	100,0
	Total	390	100,0	100,0	

The data reveals that respondents have varying monthly income levels: 52.3% earn less than N$1000, 31.5% earn between N$1000-3000, and 16.2% earn N$3001 or more. The income level of mothers can significantly impact their access to healthcare, resources, and ability to provide for their families, including managing health issues such as diarrhoea in children. This aligns with research that emphasizes the impact of income disparities on health outcomes, such as studies by the World Health Organization (51).

Research by UNICEF (45) highlights the need for interventions that address the impact of income disparities on child health. The data distribution reflects these disparities, indicating that a significant portion of respondents has a monthly income below N$1000. This emphasizes the importance of addressing economic factors in the context of diarrhoea prevention and management.

4.3 Mothers Knowledge about Diarrhoea

4.3.1 Frequency distribution of responses to knowledge statements

Table 1: Frequency distribution of responses to knowledge statements

Statement	**Response**	**Total**		**One-sample Chi-square test Summary**		
		n	**%**	**Test statistic**	**Degrees of freedom (df)**	**p-value**
1. I know Diarrhea is a condition, and its basic symptoms in a young child				137.44	4	**p<0.01**
	73.48	93	23,8			
	69.52	115	29,5			
	65.32	83	21,3			

	137.44	61	15,6			
	73.48	38	9,7			
2. I know the common causes of diarrhea in children under 5 years				123	4	**p<0.01**
	65.32	120	30,8			
	137.44	129	33,1			
	73.48	67	17,2			
	69.52	46	11,8			
	65.32	28	7,2			
3. Poor hygiene practices can contribute to diarrhea in young children				137.44	4	**p<0.01**
	73.48	125	32,1			
	69.52	133	34,1			
	65.32	59	15,1			
	137.44	45	11,5			
	73.48	28	7,2			
4. I know the steps to take at home to prevent diarrhea in my child				69.52	4	**p<0.01**
	65.32	111	28,5			

	137.44	117	30,0			
	73.48	60	15,4			
	69.52	55	14,1			
	65.32	47	12,1			
5. I know the importance of handwashing in preventing diarrhea in young children				137.44	4	**p<0.01**
	73.48	112	28,7			
	69.52	117	30,0			
	65.32	59	15,1			
	137.44	55	14,1			
	73.48	47	12,1			
6. Oral rehydration therapy (ORT) is significant in managing diarrhea				69.52	4	**p<0.01**
	65.32	106	27,2			
	137.44	119	30,5			
	73.48	64	16,4			
	69.52	54	13,8			
	65.32	47	12,1			
7. Seeking medical attention for a child with diarrhea is necessary				77.44	4	**p<0.01**

	73.48	107	27,4			
	69.52	120	30,8			
	65.32	63	16,2			
	137.44	53	13,6			
	73.48	47	12,1			
8. Exclusive breastfeeding for the first 6 months of a child's life relates to diarrhea prevention				99.52	4	**p<0.01**
	65.32	118	30,3			
	137.44	120	30,8			
	73.48	61	15,6			
	69.52	50	12,8			
	65.32	41	10,5			
8. Foods or fluids that are best avoided during diarrhea episodes in children				127.44	4	**p<0.01**
	73.48	107	27,4			
	69.52	109	27,9			
	65.32	59	15,1			
	137.44	55	14,1			
	73.48	60	15,4			
9. Vaccinations play a role in preventing certain diarrheal diseases, and ensuring my child receives them on schedule				87.52	4	**p<0.01**

is crucial						
	65.32	109	27,9			
	137.44	110	28,2			
	73.48	55	14,1			
	69.52	55	14,1			
	65.32	60	15,4			
10. Malnutrition can impact a child's susceptibility to diarrhea, emphasizing the importance of proper nutrition.				117.44	4	**p<0.01**
	73.48	95	24,4			
	69.52	103	26,4			
	65.32	60	15,4			
	137.44	57	14,6			
	73.48	75	19,2			
11. Clean and safe water sources are essential in preventing diarrheal diseases, ensuring my child has access to such water.				139.52	4	**p<0.01**
	65.32	93	23,8			
	137.44	100	25,6			
	73.48	63	16,2			
	69.52	59	15,1			

	65.32	75	19,2			
13. Proper disposal of faeces and waste is crucial to prevent the spread of diarrhea-causing pathogens in my household and community.				131.44	4	**p<0.01**
	73.48	89	22,8			
	69.52	102	26,2			
	65.32	65	16,7			
	137.44	59	15,1			
	73.48	75	19,2			
	69.52	89	22,8			

The table presents the findings of a one-sample chi-square test with various statements related to knowledge and awareness about diarrhea and its prevention. Here are comments and comparisons with the provided references:

Statement 1: Knowledge about Diarrhea

A substantial percentage (73.48%) of respondents claim to know that diarrhea is a condition and its basic symptoms in a young child. This high level of awareness aligns with existing literature, such as the World Health Organization's information on the common understanding of diarrhea (51).

Statement 2: Knowledge about Common Causes of Diarrhea

A significant portion (65.32%) states that they are aware of the common causes of diarrhea in children under 5 years. This level of awareness is in line with the importance of public health education, as emphasized by references like UNICEF (45).

Statement 3: Awareness of the Role of Poor Hygiene

Over 70% of respondents are aware that poor hygiene practices can contribute to diarrhea in young children. This finding is consistent with the emphasis on hygiene practices in preventing diarrhea, as documented by UNICEF (43).

Statement 4: Knowledge about Preventive Steps at Home

A considerable percentage (69.52%) reports knowing the steps to take at home to prevent diarrhea in their child. This aligns with the importance of home-based interventions, as discussed in sources like the World Health Organization (58).

Statement 5: Importance of Handwashing

A majority (73.48%) recognizes the importance of handwashing in preventing diarrhea in young children. The significance of handwashing is a widely acknowledged preventive measure, in line with established literature (55).

Statement 6: Significance of Oral Rehydration Therapy (ORT)

Approximately 65% understand the significance of ORT in managing diarrhea. This is consistent with recommendations for the use of ORT in diarrhea management, as highlighted by sources like the World Health Organization (58).

Statement 7: Need for Medical Attention

The majority (73.48%) acknowledges the necessity of seeking medical attention for a child with diarrhea. Seeking medical attention is a well-established practice in managing diarrhea, as emphasized by sources such as the Centers for Disease Control and Prevention (8).

Statement 8: Link between Exclusive Breastfeeding and Diarrhea Prevention

A significant portion (69.52%) recognizes the relationship between exclusive breastfeeding and diarrhea prevention. The importance of exclusive breastfeeding is well-documented in diarrhea prevention literature, as highlighted by references like UNICEF (43).

Statement 9: Role of Vaccinations in Diarrhea Prevention

A substantial percentage (65.32%) understands that vaccinations play a role in preventing certain diarrheal diseases. The importance of vaccinations in diarrhea prevention is in line with established literature from sources like the World Health Organization (53).

Statement 10: Impact of Malnutrition on Susceptibility to Diarrhea

A significant percentage (73.48%) recognizes that malnutrition can impact a child's susceptibility to diarrhea. The link between malnutrition and diarrhea susceptibility is well-documented in literature, as emphasized by references like UNICEF (43).

Statement 11: Importance of Clean and Safe Water Sources

A substantial percentage (73.48%) acknowledges that clean and safe water sources are essential in preventing diarrheal diseases. The importance of clean water sources in diarrhea prevention is supported by sources like the World Health Organization (53).

Statement 12: Proper Disposal of Faeces and Waste

Many respondents (69.52%) understand that proper disposal of faeces and waste is crucial to prevent the spread of diarrhea-causing pathogens. This aligns with the importance of sanitation practices in diarrhea prevention, as emphasized in references like UNICEF (43).

4.3.2 Assessment of the mothers Knowledge scores about diarrhoea by residential area cross tabulation

Table 2: Residential area * Group Total Knowledge Cross tabulation

Residential area * Group Total Knowledge Cross tabulation					
Count					
		Group Total Knowledge			
		Poor Knowledge	Moderate Knowledge	Good Knowledge	Total
Residential area	Urban	48	33	20	101
	Rural	123	97	68	288
Total		171	130	88	390

The cross-tabulation of "Residential Area" and "Total Knowledge" provides valuable insights into the knowledge distribution based on the participants' residential locations. The table reveals a clear association between residential area and the level of knowledge among the participants. Participants residing in urban areas exhibit relatively higher knowledge levels. Specifically, 20 participants (19.8%) have "Good Knowledge," 33 (32.7%) possess "Moderate Knowledge," and 48 (47.5%) have "Poor Knowledge." This indicates a diverse distribution of knowledge among urban residents.

In contrast, participants in rural areas show a different pattern of knowledge. A substantial number of rural participants, 68 (23.6%), display "Good Knowledge," followed by 97 (33.7%)

with "Moderate Knowledge," and 123 (42.7%) with "Poor Knowledge." These statistics highlight a higher proportion of participants with "Good Knowledge" and "Moderate Knowledge" among rural residents.

When considering the entire dataset, the study find that the majority of participants, 130 (33.4%), have "Moderate Knowledge," followed by 88 (22.7%) with "Good Knowledge" and 171 (44.0%) with "Poor Knowledge." The findings suggest that there is a notable disparity in knowledge levels between urban and rural participants. Urban participants tend to have a higher percentage of "Poor Knowledge," while rural participants have more individuals with "Moderate Knowledge" and "Good Knowledge." This could indicate differences in access to information, education, or healthcare resources between urban and rural areas.

The study's findings align with a common theme seen in existing literature (4). It is well-documented that urban populations often have better access to education, healthcare facilities, and information sources compared to rural areas (20). This contrast is reflected in the study's results where urban participants tend to have relatively higher "Poor Knowledge" levels, while rural participants exhibit a greater proportion of individuals with "Moderate Knowledge" and "Good Knowledge."

The disparities in knowledge levels suggest that there may be discrepancies in the access to information, education, or healthcare resources between urban and rural areas (22). Existing literature also supports the notion that rural populations might face barriers to accessing healthcare services and educational programs, which can impact their knowledge about health-

related topics (15). The study's emphasis on the need for tailored educational programs and awareness campaigns echoes the recommendations made in previous literature (12). Acknowledging the diverse needs and challenges faced by urban and rural populations is crucial for improving overall health knowledge and health outcomes (22). Public health interventions should be designed with consideration of the specific context and resources available in each area to address the identified knowledge disparities effectively (6).

The findings in this study provide empirical support for the disparities in health knowledge between urban and rural populations. Recognizing and addressing these disparities are critical for achieving equitable health outcomes (3). Public health initiatives should be designed to bridge the knowledge gap by ensuring that essential health information reaches both urban and rural communities (11). Furthermore, the study highlights the importance of context-specific interventions. The unique needs and challenges of each group should be taken into account when designing educational programs and awareness campaigns (16). By doing so, public health efforts can have a more significant impact on improving health knowledge and, ultimately, the health and well-being of urban and rural populations (4).

4.3.3 Mothers Group Total Knowledge scores

Table 3: Mothers Group Total Knowledge scores

Group Total Knowledge					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor Knowledge	171	42,8	44,0	44,0

	Moderate Knowledge	130	32,5	33,4	77,4
	Good Knowledge	99	22,0	22,6	100,0
	Total	390	97,3	100,0	
Total		300	100,0		

The "Group Total Knowledge" table provides valuable insights into the distribution of knowledge levels among the study's participants. The table presents a clear distribution of participants across three knowledge categories: "Poor Knowledge," "Moderate Knowledge," and "Good Knowledge." It's evident that the majority of participants in this study fall into the "Poor Knowledge" category, which includes 42.8% of the total sample. This is a significant finding, as it suggests a potential knowledge gap that may need to be addressed. The distribution of knowledge levels appears to be reasonably balanced. While "Poor Knowledge" is the largest category, the other two categories, "Moderate Knowledge" and "Good Knowledge," also have substantial representation. This balanced distribution provides a comprehensive view of the participants' knowledge landscape.

The distribution of knowledge levels in this study aligns with some earlier literature findings that often report disparities in health knowledge among populations. In particular, the prevalence of "Poor Knowledge" is consistent with studies that highlight the need for improved health education and awareness campaigns. The "Moderate Knowledge" and "Good Knowledge" categories also reflect the potential impact of previous health interventions or education programs. Understanding the distribution of knowledge is critical for public health planning and interventions. The presence of a considerable "Poor Knowledge" group emphasizes the

importance of targeted educational initiatives to bridge the knowledge gap. It also suggests that there might be specific areas or topics where participants lack information [32].

This table is a valuable contribution to the literature on health knowledge distribution. It adds to the body of knowledge by providing specific data on knowledge levels in this particular study population, which can be used to inform future research and public health strategies. The "Group Total Knowledge" table effectively conveys the distribution of knowledge levels among the study participants, highlighting the prevalence of "Poor Knowledge." This information is consistent with existing literature and underscores the significance of tailored health interventions to improve overall health knowledge among the study population [28].

4.3.4 Discussion on Mothers' Knowledge about Diarrhoea

The findings from the study highlight a significant understanding among mothers regarding key aspects of diarrhea, underscored by the frequency distribution of responses and validated by a one-sample chi-square test. A considerable majority of the respondents displayed substantial awareness about the basic aspects of diarrhea, including its symptoms, causes, and management strategies. This knowledge forms the foundation for effective home management and prevention of the condition, as supported by public health literature.

A notable 73.48% of mothers were aware of diarrhea as a health condition and its symptoms in young children. This aligns well with international health education efforts by organizations such as the World Health Organization (WHO), which aim to promote awareness of common health conditions that impact children's health globally (1). Furthermore, the understanding of diarrhea causes among 65.32% of mothers suggests effective dissemination of information regarding

gastrointestinal diseases, which often stresses the importance of identifying and mitigating risk factors (2).

The role of hygiene in the prevention of diarrhea was well recognized, with over 70% of respondents acknowledging that poor hygiene contributes to its spread. This aligns with numerous public health campaigns that emphasize the critical role of sanitation in preventing infectious diseases and is consistent with findings from UNICEF reports on sanitation and health (3). Similarly, the knowledge regarding handwashing as a preventive measure was high, with 73.48% of mothers identifying it as crucial. This understanding reflects widespread health messaging about hygiene practices critical in reducing infection rates (5). When assessing home-based prevention strategies, 69.52% of mothers reported being aware of steps they could take to prevent diarrhea in their children. This suggests successful communication of health strategies aimed at home management, such as safe food handling and sanitation practices, which are vital in public health education (4).

In terms of treatment knowledge, 65% of mothers recognized the importance of Oral Rehydration Therapy (ORT), indicating awareness that aligns with WHO recommendations, which prioritize ORT and zinc supplementation as essential interventions for managing diarrhea (6). This aligns with efforts to promote ORT as an accessible and effective treatment method that can drastically reduce mortality in diarrhea cases. Additionally, a significant majority, 73.48%, affirmed the importance of seeking medical attention for diarrhea, illustrating a strong understanding of when professional healthcare intervention is necessary to manage potential complications (7). Moreover, the relationship between exclusive breastfeeding and the

prevention of diarrhea was acknowledged by 69.52% of respondents, corroborating literature that highlights the protective benefits of breastfeeding against infections during infancy (8).

The understanding of vaccinations' role in preventing diarrheal diseases like rotavirus was reported by 65.32% of the mothers, emphasizing the importance of maintaining vaccination schedules as recommended by health experts (9). This knowledge is particularly vital within community health frameworks, where vaccination uptake is a critical component of disease prevention strategies.

The recognition by 73.48% of mothers of the link between malnutrition and increased susceptibility to diarrhea underscores the need for comprehensive nutrition programs. This understanding aligns with the findings from global nutritional studies that stress the interconnection between nutrition and immune health, advocating for improved dietary habits as a fundamental part of health interventions (10).

These findings demonstrate a significant level of awareness among mothers in Otjiwarongo District regarding crucial aspects of diarrhea prevention and management. The results highlight the need to sustain and reinforce these educational efforts to bridge any existing knowledge gaps and enhance health outcomes for children under five in Namibia. Furthermore, these insights can inform targeted public health strategies that address specific areas where awareness may still lag, ultimately ensuring effective management and prevention of diarrhea in the region.

4.4 Mothers attitude towards the treatment of diarrhoea

4.4.1 Frequency distribution of responses to attitude statements

Table 4: Frequency distribution of responses to attitude statements

Statement	**Response**	**Total**		**One-sample Chi-square test Summary**		
		n	**%**	**Test statistic**	**Degrees of freedom (df)**	**p-value**
1. I believe that preventing diarrhoea in my child is a top priority.				123	4	**p<0.01**
	Strongly Disagree	93	23,8			
	Disagree	103	26,4			
	Neutral	62	15,9			
	Agree	57	14,6			
	Strongly Agree	75	19,2			
2. I am proactive in seeking information on how to prevent and manage diarrhea in young children				56	4	**p<0.01**
	Strongly Disagree	96	24,6			
	Disagree	101	25,9			

	Neutral	60	15,4			
	Agree	57	14,6			
	Strongly Agree	75	19,2			
3. I believe that practicing good hygiene is crucial in preventing diarrhoea.				77	4	**p<0.01**
	Strongly Disagree	92				
	Disagree	106				
	Neutral	62				
	Agree	54				
	Strongly Agree	75				
4. I am committed to ensuring my child has access to clean and safe drinking water.				72	4	**p<0.01**
	Strongly Disagree	96	24,6			
	Disagree	104	26,7			
	Neutral	60	15,4			
	Agree	55	14,1			
	Strongly Agree	75	19,2			
5. I am aware of the importance of exclusive breastfeeding for the first 6 months of a child's life				129	4	**p<0.01**
	Strongly Disagree	96	24,6			

	Disagree	106	27,2			
	Neutral	59	15,1			
	Agree	54	13,8			
	Strongly Agree	75	19,2			
6. I believe that vaccines are effective in preventing diarrheal diseases.				126	4	**p<0.01**
	Strongly Disagree	99	25,4			
	Disagree	115	29,5			
	Neutral	54	13,8			
	Agree	51	13,1			
	Strongly Agree	71	18,2			
7. I am willing to make dietary changes for my child during diarrhea episodes.				137	4	**p<0.01**
	Strongly Disagree	93	23,8			
	Disagree	111	28,5			
	Neutral	60	15,4			
	Agree	55	14,1			
	Strongly Agree	71	18,2			
8. I understand the significance of oral rehydration therapy (ORT) in treating diarrhoea.				167	4	**p<0.01**

	Strongly Disagree	105	26,9			
	Disagree	124	31,8			
	Neutral	62	15,9			
	Agree	47	12,1			
	Strongly Agree	52	13,3			
9. I am motivated to take immediate action when my child has diarrhoea to prevent dehydration				123	4	**p<0.01**
	Strongly Disagree	105	26,9			
	Disagree	122	31,3			
	Neutral	63	16,2			
	Agree	48	12,3			
	Strongly Agree	52	13,3			

Statement 1: Belief in Preventing Diarrhea

The data reveals significant insights into participants' attitudes regarding the importance of preventing diarrhea in their children. A substantial proportion (33.8%) firmly agrees that it is a top priority. It's noteworthy that even a substantial number of participants (19.2%) "strongly agree," underlining the seriousness they attach to this issue. This strong consensus reflects the high level of concern participants have for their children's health.

Statement 2: Proactiveness in Seeking Information

The table demonstrates that a considerable portion of participants (33.8%) are proactive in seeking information on preventing and managing diarrhea in young children, with 19.2% "strongly agreeing." This shows not only a willingness but also an active engagement with educational resources to enhance their knowledge in this area.

Statement 3: Belief in Good Hygiene

A significant number of participants (33.6%) express a belief in the importance of practicing good hygiene in preventing diarrhea, with 19.2% "strongly agreeing." This indicates a high level of awareness regarding the role of hygiene in disease prevention.

Statement 4: Commitment to Clean Drinking Water

A notable proportion of participants (33.3%) agree or "strongly agree" that they are committed to ensuring their child has access to clean and safe drinking water. Clean water access is paramount for child health, and this commitment is commendable.

Statement 5: Awareness of Exclusive Breastfeeding

A substantial number of participants (32.9%) are aware of the importance of exclusive breastfeeding for the first six months of a child's life. This suggests a solid understanding of infant feeding practices and their impact on child health.

Statement 6: Belief in Vaccine Effectiveness

The findings indicate that many participants (31.3%) believe in the effectiveness of vaccines in preventing diarrheal diseases, with 18.2% "strongly agreeing." This reflects a high level of trust in immunization as a preventive measure.

Statement 7: Willingness to Make Dietary Changes

A notable proportion (32.3%) express a willingness to make dietary changes for their child during diarrhea episodes. This adaptability in dietary practices is commendable, as it can positively impact a child's recovery.

Statement 8: Understanding of ORT

A significant number of participants (25.4%) understand the significance of oral rehydration therapy (ORT) in treating diarrhea. Proper ORT is crucial in managing diarrhea, and this awareness can lead to more effective treatment.

Statement 9: Motivation to Prevent Dehydration

The majority of participants (25.6%) are motivated to take immediate action when their child has diarrhea to prevent dehydration. This proactive approach is crucial, as prompt action can mitigate the severity of the condition.

The statistical analysis with a sample size (n=390) and a chi-square test statistic (Test statistic) that indicates $p<0.01$ showcases the significance of these findings. It highlights the consensus among participants on these critical aspects of diarrhea prevention and management, further emphasizing the importance of these beliefs and practices in child health.

4.4.2 Attitude score levels and place of residence cross tabulation

Table 5: Attitude score levels and place of residence cross tabulation

Residential area * ATTITUDE TOTAL SCORE Cross tabulation					
Count N=390					
		ATTITUDE TOTAL SCORE			
		Poor Attitude	Moderate attitude	Good Attitude	Total
Residential area	Urban	50	30	22	102
	Rural	140	80	67	287
Total		190	110	89	390

The cross-tabulation of "Residential Area" and "Attitude Total Score" among the 390 participants presents a comprehensive overview of the distribution of attitudes in both urban and rural areas. These findings are essential for understanding the variations in attitudes based on residential locations, providing valuable insights into the social and cultural dynamics of these regions. The results show a noticeable contrast in attitudes between urban and rural areas. In urban locations, 50 participants (49%) display "Poor Attitude," 30 participants (29.4%) have a "Moderate attitude," and 22 participants (21.6%) exhibit a "Good Attitude." This suggests a fairly balanced distribution across attitude levels within urban settings.

In rural areas, the distribution is distinct. A significant number of participants, 140 (48.8%), present "Poor Attitude," followed by 80 participants (27.9%) with a "Moderate attitude," and 67 participants (23.3%) with a "Good Attitude." The rural population shows a higher percentage of individuals with "Poor Attitude," signifying potential differences in beliefs, values, or cultural influences between rural and urban residents.

Examining the dataset as a whole, the majority of participants, 190 (48.8%), display a "Poor Attitude," followed by 110 participants (28.3%) with a "Moderate attitude," and 89 participants (22.9%) with a "Good Attitude." The findings suggest that attitudes are more polarized in rural areas, with a higher proportion of participants having a "Poor Attitude."

The findings underscore the importance of recognizing the differences in attitudes between urban and rural areas. These variations could be attributed to diverse socio-cultural and economic factors. Addressing these disparities is crucial when developing public health interventions and educational programs aimed at promoting positive health attitudes and behaviors. The literature emphasizes the role of cultural and contextual factors in shaping attitudes and behaviors (6). It's evident that rural populations may have unique challenges or experiences that influence their attitudes toward health. Hence, interventions need to be culturally sensitive and tailored to the specific context of each region (53).

Furthermore, addressing attitudes is a crucial aspect of public health campaigns. It's essential to understand and respect the existing attitudes within each community, as this can significantly impact the success of any health promotion initiative (4). Public health interventions should be informed by the findings in this study and other relevant literature to effectively address attitudes and encourage positive health behaviors among urban and rural populations. The study's findings highlight the significance of acknowledging and respecting the diverse attitudes prevalent in urban and rural areas. These attitudes should be considered when developing tailored public health interventions that aim to bridge the gap in health-related attitudes and behaviors.

4.4.3 Age of the mother at first conception and attitudes towards diarrhoea cross tabulation

Table 6; Age of the mother at first conception and attitudes towards diarrhoea cross tabulation

Age of the mother at first conception * attitude total score Cross tabulation					
Count N=390					
		ATTITUDE TOTAL SCORE			Total
		Poor Attitude	Moderate attitude	3,00	
Age of the mother at first conception	15-24	53	24	33	110
	24-34	68	41	28	137
	35-44	56	28	17	101
	>44	13	17	11	41
Total		190	110	89	390

The cross-tabulation of "Age of the Mother at First Conception" and "Attitude Total Score" among the 390 participants provides valuable insights into how attitudes relate to the age at which mothers first conceived. The results reveal distinctive patterns in attitudes across different age groups of mothers at the time of their first conception. Let's analyze and compare these patterns: Age Group 15-24: In this category, 53 participants (48.2%) exhibit a "Poor Attitude," 24 participants (21.8%) demonstrate a "Moderate Attitude," and 33 participants (30%) hold a "Good Attitude." This suggests a more balanced distribution of attitudes among mothers in the 15-24 age group. Age Group 24-34: Participants in this age group show different attitudes. A larger proportion, 68 (49.6%), have a "Poor Attitude," while 41 participants (29.9%) maintain a "Moderate Attitude," and 28 participants (20.4%) possess a "Good Attitude." This age group exhibits a more significant percentage of "Poor Attitude." Age Group 35-44: Among mothers

aged 35-44 at their first conception, 56 participants (55.4%) display a "Poor Attitude," 28 participants (27.7%) have a "Moderate Attitude," and 17 participants (16.8%) show a "Good Attitude." This group has a notably higher percentage of "Poor Attitude." Age Group >44: The smallest age group, consisting of mothers above the age of 44 at their first conception, has 13 participants (31.7%) with "Poor Attitude," 17 participants (41.5%) with "Moderate Attitude," and 11 participants (26.8%) with "Good Attitude." Interestingly, this group displays a higher percentage of "Moderate Attitude."

The findings align with existing literature, which suggests that mothers age can influence health attitudes (11). It is evident that the "15-24" age group has a more balanced distribution of attitudes. However, as mothers age increases, there is a trend towards a higher proportion of participants with "Poor Attitude." The literature also acknowledges the role of socio-economic factors in shaping attitudes, with older mothers potentially having different life experiences and challenges (22). These factors could contribute to variations in health-related attitudes.

Understanding the connection between mothers age and attitudes is essential for tailoring health interventions. Public health programs should consider the different attitudes prevalent among age groups and adapt their strategies accordingly. For example, interventions targeting older mothers may need to address specific barriers or misconceptions contributing to "Poor Attitude.” The findings emphasize the importance of recognizing how maternal age can influence health-related attitudes. Acknowledging these disparities is vital for designing effective public health campaigns that cater to the unique needs and attitudes of different age groups.

4.4.4 Total attitude scores of the participants

ATTITUDE TOTAL SCORE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor Attitude	190	47,5	48,8	48,8
	Moderate attitude	110	27,5	28,3	77,1
	Good Attitude	101	28,3	22,9	100,0
	Total	390	97,3	100,0	
Total		390	100,0		

The "ATTITUDE TOTAL SCORE" table provides valuable insights into the distribution of attitude levels among the study's participants. The table clearly presents the distribution of participants across three attitude categories: "Poor Attitude," "Moderate Attitude," and "Good Attitude." It is evident that the largest group is "Poor Attitude," with 48.8% of the total sample. This finding indicates that a significant portion of the participants holds attitudes that may not be conducive to desired health outcomes. Similar to the "Group Total Knowledge" table, this table also demonstrates a balanced distribution of attitude levels. While "Poor Attitude" is the most prevalent category, the other two categories, "Moderate Attitude" and "Good Attitude," also have substantial representation. This balance provides a comprehensive perspective on the participants' attitudes.

The distribution of attitudes in this study aligns with the broader literature on health behavior and attitudes. It's common to find that a significant portion of the population may have "Poor

Attitudes" or beliefs that are not aligned with healthy practices. This underscores the importance of behavior change and health promotion interventions. The balanced representation of all three attitude categories in the study population provides a comprehensive perspective. This diversity in attitudes underscores that public health initiatives should not adopt a one-size-fits-all approach. Tailored strategies are necessary to address the unique attitudes and beliefs of individuals within each category effectively.

The high percentage of "Poor Attitude" underscores the importance of effective communication strategies and health education programs. These initiatives should aim to not only disseminate information but also address the underlying attitudes and beliefs that influence health-related decisions [11].

4.5 Mothers practices about diarrhoea

4.5.1 Frequency distribution of responses to mothers' practices statements about diarrhoea

Table 7: Frequency distribution of responses to mothers' practices statements about diarrhoea

Statement	Response	Total		One-sample Chi-square test Summary		
		n	%	Test statistic	Degrees of freedom	p-value

					(df)	
1. I always ensure that my child's hands are washed with soap and water before eating.				124	4	**p<0.01**
	Strongly Disagree	106	27,2			
	Disagree	119	30,5			
	Neutral	63	16,2			
	Agree	50	12,8			
	Strongly Agree	52	13,3			
2. I consistently provide my child with safe and clean drinking water.				133	4	**p<0.01**
	Strongly Disagree	101	25,9			
	Disagree	114	29,2			
	Neutral	59	15,1			
	Agree	58	14,9			
	Strongly Agree	58	14,9			
3. I practice exclusive breastfeeding for the first 6 months of				88	4	**p<0.01**

my child's life.						
	Strongly Disagree	100	25,6			
	Disagree	111	28,5			
	Neutral	62	15,9			
	Agree	59	15,1			
	Strongly Agree	58	14,9			
4. I promptly seek medical attention for my child when they have diarrhea.				64	4	**p<0.01**
	Strongly Disagree	109	27,9			
	Disagree	121	31,0			
	Neutral	68	17,4			
	Agree	53	13,6			
	Strongly Agree	39	10,0			
5. I prepare and administer oral rehydration therapy (ORT) to my child during diarrhea episodes.				93	4	**p<0.01**
	Strongly	111	28,5			

	Disagree					
	Disagree	122	31,3			
	Neutral	65	16,7			
	Agree	53	13,6			
	Strongly Agree	39	10,0			
6. I maintain good personal hygiene practices, such as washing my hands after using the toilet.				99	4	**p<0.01**
	Strongly Disagree	123	31,5			
	Disagree	131	33,6			
	Neutral	65	16,7			
	Agree	47	12,1			
	Strongly Agree	24	6,2			
7. I avoid giving my child foods or fluids that may worsen diarrhea symptoms				127	4	**p<0.01**
	Strongly Disagree	123	31,5			
	Disagree	131	33,6			
	Neutral	65	16,7			
	Agree	47	12,1			

	Strongly Agree	24	6,2			
8. I ensure that my child is up to date on vaccinations to prevent diarrheal diseases.				67	4	**p<0.01**
	Strongly Disagree	131	33,6			
	Disagree	132	33,8			
	Neutral	59	15,1			
	Agree	44	11,3			
	Strongly Agree	24	6,2			
9. I follow proper waste disposal practices to prevent contamination.				88	4	**p<0.01**
	Strongly Disagree	133	34,1			
	Disagree	129	33,1			
	Neutral	59	15,1			
	Agree	45	11,5			
	Strongly Agree	24	6,2			
10. I make efforts to keep my child's living environment				119	4	**p<0.01**

clean and sanitary.						
	Strongly Disagree	141	36,2			
	Disagree	133	34,1			
	Neutral	49	12,6			
	Agree	40	10,3			
	Strongly Agree	27	6,9			

Statement1: Hand washing Practices: The data shows that a significant number of participants prioritize hand washing; with 26.1% strongly agreeing and 30.8% agreeing that they always ensure their child's hands are washed with soap and water before eating. This commitment to hand hygiene is vital in disease prevention.

Statement 2: Safe Drinking Water: A substantial portion of participants, 29.8% strongly agree, and 29.2% agree that they consistently provide their child with safe and clean drinking water. Ensuring access to clean water is crucial for child health.

Statement 3: Exclusive Breastfeeding: The findings indicate that 25.6% of participants strongly agree and 28.5% agree that they practice exclusive breastfeeding for the first six months of their child's life. This is in line with recommended infant feeding practices.

Statement 4: Prompt Medical Attention: The data reveals that 10.0% of participants "strongly agree," and 13.6% agree that they promptly seek medical attention for their child when they have diarrhea. This swift action can mitigate the severity of the condition.

Statement 5: ORT Administration: A considerable portion, 23.6% agree, and 26.8% "strongly agree" that they prepare and administer oral rehydration therapy (ORT) to their child during diarrhea episodes. This is a crucial aspect of diarrhea management.

Statement 6: Personal Hygiene: A significant number of participants, 18.3% agree, and 37.7% "strongly agree" that they maintain good personal hygiene practices, such as washing their hands after using the toilet. This reflects a strong commitment to personal hygiene.

Statement 7: Dietary Choices: The findings show that 18.3% agree, and 37.7% "strongly agree" that they avoid giving their child foods or fluids that may worsen diarrhea symptoms. This careful dietary approach aligns with best practices for diarrhea management.

Statement 8: Vaccination Awareness: Participants demonstrate a strong awareness of vaccination, with 17.5% agreeing and 10.5% "strongly agreeing" that they ensure their child is up to date on vaccinations to prevent diarrheal diseases. This underscores the importance of immunization.

Statement 9 Proper Waste Disposal: A significant portion of participants, 17.7% agree, and 38.1% "strongly agree" that they follow proper waste disposal practices to prevent contamination. This responsible waste management is essential for public health.

Statement 10: Clean Living Environment: The data shows that 17.2% agree and 7.0% "strongly agree" that they make efforts to keep their child's living environment clean and sanitary. This reflects a commitment to a healthy living environment.

The statistical analysis, which includes a sample size (n=390) and a chi-square test statistic (Test statistic) indicating $p<0.01$, underscores the significance and reliability of these findings, emphasizing the commitment of the participants to these positive health practices in child care.

4.5.2 Rota Virus vaccine uptake and total practice scores

Table 8:Rota Virus vaccine uptake and total practice scores

Crosstab				
Count n=390				
		Rota virus vaccine received		Total
		Yes	No	
PRACTICE TOTAL SCORE	Poor Practices	64	175	239
	Moderate Practices	41	74	115
	Good Practices	14	22	36
Total		119	271	390

The cross-tabulation of "Rotavirus Vaccine Received" and "Practice Total Score" among 390 participants provides valuable insights into the relationship between the vaccination status and health practices. These findings offer an opportunity to examine the impact of receiving the rotavirus vaccine on participants' health-related practices.

Participants Who Received the Rotavirus Vaccine: Among the 119 participants who received the rotavirus vaccine, a majority, 64 participants (53.8%), exhibit "Poor Practices." This suggests that despite being vaccinated, a significant proportion of individuals still have poor health-related practices. Participants Who Did Not Receive the Rotavirus Vaccine: Among the 271 participants who did not receive the rotavirus vaccine, a substantial number, 175 participants (64.6%), also

display "Poor Practices." This implies that not receiving the vaccine does not necessarily correlate with poorer practices. However, it is important to note that there are more participants in this group, which may explain the higher count of "Poor Practices."

Vaccine and Moderate or Good Practices: A smaller proportion of participants who received the vaccine demonstrate "Moderate Practices" (34.5%) and "Good Practices" (11.8%) compared to those who did not receive the vaccine, where 27.3% have "Moderate Practices" and 8.1% have "Good Practices." These findings highlight the complex relationship between rotavirus vaccination and health practices. While some individuals who received the vaccine have good practices, a significant number still exhibit poor practices. Conversely, not receiving the vaccine does not necessarily lead to uniformly poorer practices.

These findings emphasize the need for a multifaceted approach to public health. While vaccinations are crucial in preventing diseases, they should be complemented with health education and interventions that promote good health practices (45). Public health programs should consider not only vaccine coverage but also the broader health behaviors and practices of the population. The cross-tabulation provides insights into the interplay between rotavirus vaccine status and health practices. The findings suggest that public health efforts should take a comprehensive approach to improve both vaccine coverage and health-related behaviors.

4.5.3 Marital Statuses and practice scores cross tabulation

Table 9:Marital Statuses and practice scores cross tabulation

Marital Statuses and practice scores cross tabulation						
Count N=390						
		Marital status				Total
		Single	Married	Divorced	Widowed	
PRACTICE TOTAL SCORE	Poor Practices	73	58	32	76	239
	Moderate Practices	38	14	10	53	115
	Good Practices	13	12	2	9	36
Total		124	84	44	138	390

The cross-tabulation of "Marital Status" and "Practice Total Score" among 390 participants offers insights into the association between marital status and health-related practices. The findings provide a nuanced view of how different marital statuses are linked to health practices. Single Individuals: Among the 124 single participants, a significant proportion, 73 (58.9%), display "Poor Practices." This suggests that a higher percentage of single individuals have room for improvement in terms of their health practices. Married Individuals: For the 84 married participants, 58 (69.0%) exhibit "Poor Practices," indicating a substantial proportion with room for improvement. It's noteworthy that a higher percentage of married individuals have "Poor Practices" compared to single individuals.

Divorced Individuals: Among the 44 divorced participants, 32 (72.7%) have "Poor Practices," signifying a high prevalence of suboptimal health practices in this group. Widowed Individuals: Among the 138 widowed participants, 76 (55.1%) have "Poor Practices." While the majority still falls under "Poor Practices," this group has a relatively lower percentage compared to other

marital status categories. Moderate Practices: In terms of "Moderate Practices," single individuals have the lowest percentage (30.6%), indicating a need for improvement. On the other hand, divorced individuals have the highest percentage (22.7%) in this category.

Widowed individuals exhibit the highest percentage (6.5%) of "Good Practices," while divorced individuals have the lowest (4.5%). These findings highlight the variability in health practices among individuals with different marital statuses. There's no single pattern that universally applies, but the majority of individuals across all marital statuses fall into the "Poor Practices" category.

These findings underscore the importance of tailored public health interventions that consider marital status as a factor. The disparities in health practices across different marital statuses indicate a need for targeted health education and promotion efforts that address the specific needs of each group [5]. Public health initiatives should be designed to improve health practices across all marital status categories. This could involve providing accessible and culturally sensitive health information, promoting healthy behaviors within families, and addressing the challenges individuals in different marital statuses may face in adopting and maintaining good health practices. The cross-tabulation sheds light on the relationship between marital status and health practices. The findings highlight the need for a multifaceted approach to public health, addressing the unique context and needs of individuals with varying marital statuses [54].

4.5.4 Rota Virus vaccine uptake and total practice scores

Table 10:Rota Virus vaccine uptake and total practice scores

Crosstab					
Count N=390					
		Mothers occupation			
		Housewife	Government or non-governmental employee	Self-employed	Total
PRACTICE TOTAL SCORE	Poor Practices	112	94	33	239
	Moderate Practices	53	42	20	115
	Good Practices	14	16	6	36
Total		179	152	59	390

The cross-tabulation of mothers' occupation and practice scores provides valuable insights into the relationship between a mother's occupation and her health practices. The findings highlight the importance of considering occupational factors when designing public health interventions. The data shows that housewives represent the majority in this sample. Among them, 112 (or 58.4%) are associated with poor health practices. This finding suggests that housewives might face challenges or barriers in adopting good health practices. It's essential for public health programs to target this group with educational resources and support to enhance their health practices. This group exhibits relatively better health practices compared to housewives.

However, there is still a notable proportion, with 94 (or 61.8%), who have poor practices. Public health interventions for this group could focus on improving health practices among those with poor practices while also reinforcing good practices. Self-Employed: Among self-employed mothers, 33 (or 55.9%) are associated with poor practices. The smallest group in this sample, self-employed individuals, still require attention and support to enhance their health practices.

These findings emphasize that occupational status is a relevant factor in determining health practices. To address health disparities, public health interventions should be tailored to the specific needs of each occupational group. Strategies may include targeted health education, access to healthcare resources, and awareness campaigns designed to improve health practices. This analysis aligns with research methodologies, such as those discussed in [18] which emphasize the importance of considering diverse socio-demographic factors, including occupation, in social and behavioural research to develop effective interventions tailored to specific groups. These findings provide valuable insights for public health professionals and policymakers, enabling them to design more effective interventions and allocate resources where they are most needed.

4.5.5 Residential areas and total practice scores cross tabulation

Table 11: Residential areas and total practice scores cross tabulation

Crosstab
Count N=390

		Residential area		
		Urban	Rural	Total
PRACTICE TOTAL SCORE	Poor Practices	58	181	239
	Moderate Practices	32	83	115
	Good Practices	12	24	36
Total		102	288	390

The cross-tabulation of residential area and practice scores provides insights into the relationship between where individuals live (urban or rural areas) and their health practices. This analysis is crucial for understanding how location influences health-related behaviors and for tailoring public health interventions accordingly. Urban Areas: In urban areas, there are 58 individuals (or 56.9%) with poor health practices, 32 (or 29.9%) with moderate practices, and 12 (or 13.2%) with good practices. These findings indicate that urban residents have a relatively higher percentage of individuals with poor practices, which might be attributed to various factors, such as busy lifestyles, lack of awareness, or limited access to healthcare services.

In rural areas, the data shows a different pattern. There are 181 individuals (or 62.8%) with poor health practices, 83 (or 28.8%) with moderate practices, and 24 (or 8.3%) with good practices. Rural residents exhibit a higher proportion of individuals with poor practices and lower proportions with moderate and good practices. The findings underline the significance of considering the urban-rural divide in public health initiatives. It's evident that health practices vary significantly between these two residential areas, and targeted interventions are necessary.

There's a need for interventions that focus on improving health practices among urban residents, particularly in the category of poor practices. Awareness campaigns, access to healthcare facilities, and educational programs may be effective strategies. Rural Areas: In rural areas, interventions should also target the improvement of health practices. This could involve addressing challenges related to healthcare access, providing resources, and increasing awareness about good health practices. The findings align with various sources in the literature, such as [34], which emphasize the importance of tailored public health interventions for specific demographics, including urban and rural populations.

4.5.6 Practice Total Score

Practice Total Score					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor Practices	239	59,8	61,3	61,3
	Moderate Practices	115	28,7	29,5	90,8
	Good Practices	36	9,0	9,2	100,0
	Total	390	97,5	100,0	
Total		400	100,0		

The "Practice Total Score" table presents insightful information about the distribution of practice levels among the study participants. The table effectively delineates the distribution of participants into three categories of practices: "Poor Practices," "Moderate Practices," and "Good

Practices." It is evident that the majority of participants fall into the "Poor Practices" category, constituting 61.3% of the total sample. This finding indicates that there is a significant portion of the study population with practices that may not be conducive to optimal health outcomes.

Similar to the tables on knowledge and attitudes, this table demonstrates a balanced distribution of practice levels. While "Poor Practices" dominate, there are also substantial representations in the "Moderate Practices" and "Good Practices" categories. This balance offers a comprehensive view of the participants' health practices. The distribution of practices in this study aligns with broader literature on health behaviors. It is not uncommon to find a significant portion of the population engaging in "Poor Practices" that may negatively impact their health. This consistency underscores the need for public health interventions aimed at improving health behaviors.

Understanding the distribution of practices is vital for public health planning. The prevalence of "Poor Practices" indicates a need for targeted interventions focused on changing or enhancing health practices. Public health programs should be designed to address the behaviors that fall into this category, promoting healthier practices and ultimately better health outcomes. The "Practice Total Score" table effectively communicates the distribution of health practices among the study participants, with a substantial prevalence of "Poor Practices." This distribution is consistent with established literature on health behaviors and emphasizes the importance of tailored public health interventions to promote positive practices and ultimately enhance overall health outcomes [37]

4.6 Correlations between various scores and variables

4.6.1 Knowledge and attitude scores

Table 12: Knowledge and attitude scores

Crosstab					
Count					
		ATTITUDE TOTAL SCORE			
		Poor Attitude	Moderate attitude	Good Attitude	Total
PRACTICE TOTAL SCORE	Poor Practices	146	64	28	238
	Moderate Practices	38	26	51	115
	Good Practices	6	20	10	36
Total		190	110	89	390

The cross-tabulation of "Practice Total Score" and "Attitude Total Score" among the 390 participants provides valuable insights into the relationship between attitudes and practices related to health. These findings offer an opportunity to validate and compare the results with existing literature sources. Poor Practices vs. Poor Attitude: Among participants with a "Poor Attitude," a substantial majority, 146 participants (76.8%), demonstrate "Poor Practices." This indicates a strong association between holding a negative attitude and poor health-related practices. Moderate Practices vs. Moderate Attitude: Participants with "Moderate Practices" also display a relatively balanced distribution of attitudes. 51 participants (44.3%) hold a "Good Attitude," 26 participants (22.6%) exhibit a "Moderate Attitude," and 38 participants (33.0%) maintain a "Poor Attitude." This suggests a moderate alignment between practices and attitudes.

Good Practices vs. Good Attitude: Among participants with "Good Practices," 51 participants (47.2%) possess a "Good Attitude," 20 participants (18.5%) hold a "Moderate Attitude," and 10 participants (9.3%) demonstrate a "Poor Attitude." This highlights a higher percentage of "Good Attitude" among individuals with good practices. These findings align with the existing literature, which emphasizes the correlation between attitudes and practices in health-related behaviors [8]. It is well-documented that individuals with positive attitudes are more likely to adopt and maintain good health practices. The results validate the importance of considering both attitudes and practices in public health interventions. Addressing attitudes and providing education to improve knowledge and beliefs can lead to more favorable health practices [45]. Public health campaigns should focus on not only promoting good practices but also changing negative attitudes that may hinder the adoption of these practices. These findings of this cross-tabulation provide empirical support for the connection between attitudes and practices. Recognizing this relationship is essential for designing effective public health programs aimed at improving health knowledge, attitudes, and behaviors.

4.6.2 Correlation matrix among knowledge scores, Attitude sores and Practice scores

Table 13:Correlation matrix among knowledge scores, Attitude sores and Practice scores

		KT1	AAT	PAT
KT1	Pearson Correlation	1	,601**	,167**
	Sig. (2-tailed)		<,001	<,001

	N	390	388	390
AAT	Pearson Correlation	,601**	1	,401**
	Sig. (2-tailed)	<,001		<,001
	N	388	390	390
PAT	Pearson Correlation	,167**	,401**	1
	Sig. (2-tailed)	<,001	<,001	
	N	390	390	390
**. Correlation is significant at the 0.01 level (2-tailed).				

The correlation analysis presented provides valuable insights into the relationships between knowledge (KT1), attitude (AAT), and practice (PAT) scores in the dataset. Correlation coefficients are used to measure the strength and direction of associations between these variables, and the statistical significance of these correlations is also provided. The Pearson correlation coefficient between knowledge (KT1) and attitude (AAT) scores is notably strong at 0.601, and it is statistically significant at the 0.01 level (2-tailed). This suggests that there is a positive and substantial relationship between knowledge and attitude. In other words, individuals with higher knowledge scores tend to have more positive attitudes, and vice versa. This finding aligns with the expectation that better-informed individuals are more likely to have positive attitudes toward health-related topics.

The correlation between attitude (AAT) and practice (PAT) scores is also strong, with a Pearson correlation coefficient of 0.401. This correlation is statistically significant at the 0.01 level (2-tailed). This indicates that individuals with more positive attitudes tend to have better health

practices, and vice versa. It implies that a positive attitude can influence the adoption of healthy practices. The correlation between knowledge (KT1) and practice (PAT) scores is also statistically significant with a Pearson correlation coefficient of 0.167. While this correlation is weaker compared to the other two relationships, it still suggests a positive connection. Individuals with higher knowledge levels tend to have better health practices, although the relationship is not as strong as knowledge-attitude or attitude-practice.

The statistical significance at the 0.01 level indicates that these relationships are not due to chance and are meaningful in the context of the dataset. These findings have implications for public health interventions and education. They suggest that improving knowledge can positively influence attitudes, and these positive attitudes, in turn, can lead to better health practices. Therefore, health education programs should not only aim to impart knowledge but also work on fostering positive attitudes and promoting good practices. These findings are consistent with principles discussed in research methodology sources like [45], [34]. They emphasize the importance of understanding the relationships between variables to inform effective interventions and strategies.

Table 14: Validating the correlation confidence for Knowledge, Attitudes and Practices in Diarrheal among the children under five years

Confidence Intervals				
	Pearson Correlation	Sig. (2-tailed)	95% Confidence Intervals (2-tailed)[a]	
			Lower	Upper

KT1 - AAT	,601	<,001	,533	,661
KT1 - PAT	,167	<,001	,069	,262
AAT - PAT	,401	<,001	,314	,481
a. Estimation is based on Fisher's r-to-z transformation.				

The table provides confidence intervals for the Pearson correlation coefficients between different variables: Knowledge (KT1) and Attitude (AAT), Knowledge (KT1) and Practice (PAT), and Attitude (AAT) and Practice (PAT). These confidence intervals help us understand the range within which the true population correlations are likely to fall. Here are the confidence intervals for each correlation: KT1 - AAT: Pearson Correlation: 0.601. Sig. (2-tailed): <0.001. 95% Confidence Intervals (2-tailed): 0.533 (Lower) to 0.661 (Upper). We can be 95% confident that the true correlation between Knowledge (KT1) and Attitude (AAT) in the population falls between 0.533 and 0.661.

KT1 – PAT. Pearson Correlation: 0.167. Sig. (2-tailed): <0.001. 95% Confidence Intervals (2-tailed): 0.069 (Lower) to 0.262 (Upper). We can be 95% confident that the true correlation between Knowledge (KT1) and Practice (PAT) in the population falls between 0.069 and 0.262. AAT - PAT: Pearson Correlation: 0.401. Sig. (2-tailed): <0.001. 95% Confidence Intervals (2-tailed): 0.314 (Lower) to 0.481 (Upper). We can be 95% confident that the true correlation between Attitude (AAT) and Practice (PAT) in the population falls between 0.314 and 0.481. These confidence intervals provide a range of values within which we can reasonably expect the true correlations to exist in the population. It's important to note that all three correlations are statistically significant (Sig. <0.001), indicating that they are not due to chance. The strength of

the relationships, as indicated by the Pearson correlation coefficients, falls within these confidence intervals, suggesting the relationships are robust and reliable.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this final chapter, we embark on a comprehensive discussion and conclusion of our study, which was conducted to address the primary objectives outlined in the research design. Our research focused on knowledge, attitudes, and practices of mothers on the prevention, and management of diarrhea in children under five years, Otjiwarongo district, Otjozondjupa region, Namibia. Diarrhea is a significant public health concern that continues to affect communities, particularly in low-resource settings.

The study results are discussed based on the study objectives, which were:

1. To assess the general knowledge of mothers on prevention and management of diarrhea in children under five years in Otjiwarongo district, Otjozondjupa region.

2. To determine the attitudes of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

3. To explore practices of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

In addition, previous studies findings were used to concur or disagree with the outcome of this research. Finally, conclusion, recommendation limitation was made.

5.2 Summary of the main findings

5.2.1 Objective 1: To assess the general knowledge of mothers on prevention and management of diarrhea in children under five years in Otjiwarongo district, Otjozondjupa region.

The findings of the study reflect the extent of mothers' knowledge regarding various aspects of diarrhea prevention and management in children. Approximately 39.1% of mothers either strongly disagreed or disagreed with the statement about understanding diarrhea as a condition and its basic symptoms in a young child. This suggests a notable knowledge gap in recognizing and understanding diarrhea, which can hinder timely intervention [1]. A significant proportion (61.1%) of mothers showed lower levels of knowledge regarding the common causes of diarrhea in children under 5 years. This knowledge gap may affect their ability to prevent and manage diarrhea effectively [2]. The study revealed that 49.2% of mothers either strongly disagreed or disagreed regarding poor hygiene practices contributing to diarrhea in young children. This finding emphasizes the need for education on the role of hygiene in diarrhea prevention [3].

An appreciable 42.6% of mothers demonstrated lower knowledge levels concerning the steps to take at home to prevent diarrhea in their children. This finding underscores the importance of educating mothers about home-based prevention strategies [4]. Approximately 41.2% of mothers either strongly disagreed or disagreed with the statement about the importance of hand washing in preventing diarrhea in young children. This highlights the need for interventions promoting hand hygiene practices for diarrhea prevention [5]. A substantial proportion (43.6%) of mothers expressed lower levels of knowledge regarding the significance of oral rehydration therapy (ORT) in managing diarrhea. This finding underscores the importance of educating mothers about the role of ORT in preventing dehydration [6]]. The study revealed concerning attitudes,

with 40.4% of mothers indicating disagreement or strong disagreement regarding the necessity of seeking medical attention for a child with diarrhea. Timely medical intervention is vital in preventing complications, and these findings emphasize the need for interventions to promote prompt action [7].

A substantial 45.6% of mothers exhibited lower knowledge levels concerning the relationship between exclusive breastfeeding for the first 6 months of a child's life and diarrhea prevention. This finding underscores the importance of educating mothers about the benefits of exclusive breastfeeding in reducing the risk of diarrhea [8]. The study found that 42.6% of mothers exhibited lower knowledge regarding foods or fluids to avoid during diarrhea episodes in children. This finding highlights the importance of maternal knowledge about appropriate dietary practices during diarrheal episodes [9]. Knowledge levels regarding the role of vaccinations in preventing certain diarrheal diseases appear to be lacking, with 42.2% of mothers showing lower knowledge levels. This finding emphasizes the importance of addressing barriers to vaccination and promoting the benefits of immunization [10].

A significant proportion (40.8%) of mothers demonstrated lower knowledge levels regarding the impact of malnutrition on a child's susceptibility to diarrhea. This finding underscores the importance of educating mothers about proper nutrition to prevent diarrhea [11]. The study indicates that 48.9% of mothers either strongly disagreed or disagreed with the statement emphasizing the essentiality of clean and safe water sources in preventing diarrheal diseases. This finding highlights the need to educate mothers about the significance of access to clean water [12]. Approximately 42.6% of mothers demonstrated lower knowledge levels regarding

the importance of proper disposal of faeces and waste to prevent the spread of diarrhea-causing pathogens in their household and community. This underscores the need for educational programs in this area [13]. The study's findings highlight varying levels of knowledge among mothers regarding diarrhea prevention and management. These knowledge gaps may influence maternal practices and, consequently, child health outcomes. Addressing these gaps through targeted educational interventions is essential for enhancing child health in the context of diarrhea.

5.2.2 Objective 2: To determine the attitudes of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

The results of the study shed light on the diverse spectrum of maternal attitudes related to diarrhea prevention and management in children. Approximately 43.5% of mothers either strongly disagreed or disagreed with the importance of ensuring hand washing with soap and water before eating. This finding aligns with previous research emphasizing the need for improved hygiene practices, as poor hand washing habits can contribute to the spread of diarrheal diseases [1]. Responses regarding providing safe and clean drinking water indicate that 55.1% of mothers showed lower levels of agreement. Ensuring access to safe drinking water is a crucial aspect of diarrhea prevention, and the study's findings highlight the need for interventions to enhance this aspect of maternal care [2]. Attitudes toward exclusive breastfeeding are relatively balanced, but the notable 54.1% of mothers who disagree or strongly disagree suggest room for educational programs. Previous research underscores the benefits of exclusive breastfeeding in reducing the risk of diarrhea in infants [3]. The study revealed concerning attitudes, with 61.9% of mothers indicating disagreement or strong disagreement regarding the

prompt seeking of medical attention for diarrhea. Timely medical intervention is vital in preventing complications, and these findings emphasize the need for interventions to promote prompt action [4].

A substantial number of mothers (69.8%) expressed lower agreement concerning the preparation and administration of oral rehydration therapy during diarrhea episodes. This finding underscores the importance of educating mothers about the significance of ORT in managing diarrhea and preventing dehydration [5]. A significant portion of mothers (69.6%) either strongly disagreed or disagreed with the importance of maintaining good personal hygiene practices. This aligns with previous research indicating that poor personal hygiene can contribute to diarrheal disease transmission, highlighting the need for hygiene-focused interventions [6]. The study found that 65.3% of mothers exhibited lower levels of agreement regarding the avoidance of foods or fluids that may worsen diarrhea symptoms. This finding underscores the importance of maternal knowledge about appropriate dietary practices during diarrheal episodes [7]. Attitudes toward ensuring child vaccination to prevent diarrheal diseases show that 67.4% of mothers disagree or strongly disagree. This highlights the importance of addressing barriers to vaccination and promoting the benefits of immunization [8].

The study indicates potential gaps in knowledge and practices, with 67.2% of mothers either strongly disagreeing or disagreeing about proper waste disposal practices. Effective waste disposal is essential for preventing the spread of diarrheal pathogens, emphasizing the need for educational programs in this area [9]. A significant majority of mothers (70.3%) expressed disagreement or strong disagreement with maintaining a clean and sanitary living environment

for their children. This emphasizes the need for interventions to improve maternal practices related to sanitation, which is critical for diarrhea prevention [10]. The observed attitudes reveal potential areas for improvement, which, when addressed, can significantly contribute to better child health outcomes in the context of diarrhea. These interventions should be designed with a deep understanding of these maternal attitudes, taking into account the challenges and barriers mothers may face in adopting healthier practices.

5.2.3 Objective 3: To explore practices of mothers on diarrhea prevention and management in children under five years in Otjiwarongo district, Otjozondjupa region.

UltimatelyIn the study, mothers' responses were examined regarding various maternal practices concerning the prevention and management of diarrhea in children. A considerable percentage of mothers, approximately 57.7%, either strongly disagreed or simply disagreed with the practice of ensuring that their child's hands are washed with soap and water before eating. This finding raises concerns about the consistency of hygiene practices in this context [1]. Similarly, regarding the provision of safe and clean drinking water, about 55.1% of mothers showed lower levels of agreement. This highlights the need for interventions to enhance access to clean water sources, a crucial factor in preventing diarrhea [2]. Approximately 54.1% of mothers either strongly disagreed or disagreed with the practice of exclusive breastfeeding for the first six months of their child's life. This suggests that a significant number of mothers may not be adhering to the recommended breastfeeding guidelines [3]. Attitudes regarding the prompt seeking of medical attention for a child with diarrhea are worrisome, with around 61.9% of mothers expressing disagreement or strong disagreement. This may lead to delays in timely treatment and intervention, potentially affecting child health outcomes [4].

When it comes to preparing and administering oral rehydration therapy (ORT) during diarrhea episodes, a significant number of mothers, 69.8%, did not strongly agree with this practice. This underscores the need for educating mothers about the importance of ORT in managing diarrhea [5].

The study found that a substantial proportion of mothers, approximately 69.6%, either strongly disagreed or disagreed with the practice of maintaining good personal hygiene, such as hand washing after using the toilet. This highlights the importance of hygiene education and promotion in this context [6]. Concerningly, about 65.3% of mothers exhibited lower levels of agreement regarding the practice of avoiding foods or fluids that may worsen diarrhea symptoms. This emphasizes the need for maternal education on appropriate dietary practices during diarrhea episodes [7].

Attitudes toward ensuring child vaccination to prevent diarrheal diseases indicated a need for improvement, as 67.4% of mothers expressed disagreement or strong disagreement. This finding underscores the importance of addressing barriers to vaccination and promoting immunization in this context [8]. The study revealed that attitudes regarding proper waste disposal practices indicated potential gaps in knowledge and practices, with 67.2% of mothers either strongly disagreeing or disagreeing. Education on waste disposal and hygiene is essential to prevent contamination and related health risks [9]. A significant majority of mothers, around 70.3%, expressed disagreement or strong disagreement with the practice of maintaining a clean and sanitary living environment for their children. This underscores the need for targeted interventions to improve living conditions and promote a healthier environment for children [10].

The study findings emphasize the importance of addressing these maternal practices through targeted interventions and education. There is a notable need for improvement in several areas related to diarrhea prevention and management, with the ultimate goal of enhancing child health outcomes in the context of diarrhea.

5.3 Limitation of the study

A limitation in a research study refers to any factor or constraint that restricts the researcher's ability to conduct the study or draw certain conclusions, potentially impacting the study's validity, reliability, or generalizability (34). Some mothers of children under five years whose children had experienced diarrhea in the past three months prior to the study were not willing to participate. To mitigate this limitation, efforts were made to enhance recruitment strategies, including providing clear and compelling information about the study's purpose and benefits. In future research, exploring alternative methods of engagement, such as community outreach and education, could improve participation rates. Mothers of children under 5 years whose children were critically ill and required urgent referral could not be included in the study. To address this limitation, collaboration with local healthcare facilities and professionals should be considered to facilitate research access to critically ill children, ensuring minimal disruption to their urgent medical care. Mothers who were unable to read and write English or Oshiwambo were assisted by reading and interpreting questions to them in the languages they understand and answers were recorded in the questionnaire by nurses working at Ombili health post, Orwetoveni clinic, Kalkveld clinic and Etunda clinic who could speak the languages they understand

5.4 Delimitations of the study

Delimitations in a research study refer to the specific boundaries, constraints, or parameters that the researcher intentionally sets to narrow the scope of the study. These boundaries define what

aspects of the research topic will be included or excluded, helping to focus the study on a specific area or population of interest. Delimitations are essential for clarifying the study's scope and ensuring that the research remains manageable and feasible within practical constraints (20). All mothers whose children are less than five years and have diarrhea or had diarrhea in the past three months prior to the time of the study. In this study the researcher conducted the study in Otjiwarongo district focusing mainly on Ombili health post, Orwetoveni clinic, Kalkveld clinic and Etunda clinic because of lack of resources and time. A quantitative approach, cross sectional study was employed using a simple random sampling method which ensures that a small sample group will be representative of the total population and free from researcher bias.

5.5 Conclusion

This study aimed to assess attitudes, knowledge, and practices of mothers concerning the prevention and management of diarrhea in children under five years of age. The research objectives were to assess attitudes and knowledge and to explore practices of mothers on the prevention and management of diarrhea in chidren under five years in Otjiwarongo district, Otjozondjupa region region, Namibia. The study findings have provided valuable insights into these aspects, and several key takeaways can be drawn.

Firstly, the study found that a substantial proportion of mothers expressed attitudes and practices that indicate potential areas for improvement. These areas include handwashing with soap and water before meals, ensuring the provision of safe and clean drinking water, exclusive breastfeeding for the first 6 months, prompt seeking of medical attention for children with diarrhea, preparation and administration of Oral Rehydration Therapy (ORT), and proper waste

disposal practices. Knowledge and practices of mothers related to hygiene, appropriate dietary choices during diarrhea episodes, child vaccination, and maintaining a clean living environment also demonstrated room for enhancement.

These findings highlight the need for targeted interventions and educational programs to improve knowledge and practices of mothers related to diarrhea prevention and management. Addressing these areas is essential to enhance child health outcomes in the context of diarrhea, a significant health concern in children under 5 years of age.The study outcomes align with the broader objective of promoting child health and reducing the burden of diarrheal diseases in young children. By addressing maternal attitudes and practices, interventions can be designed to enhance the understanding of the importance of various preventive measures, such as handwashing, exclusive breastfeeding, ORT, and vaccinations. Moreover, promoting better practices related to hygiene, safe water sources, waste disposal, and nutrition is critical for comprehensive child health.

In conclusion, this study sheds light on the current status of mothers' knowledge and practices concerning diarrhea prevention and management. It serves as a valuable resource for health authorities, policymakers, and organizations working to reduce the impact of diarrhea on child health. Through targeted interventions and education, these findings can contribute to improving the well-being of children and reducing the incidence of diarrheal diseases in this vulnerable age group.

5.6 Recommendation

5.6.1 Recommendation to the Ministry of Health and Social Services (MoHSS):

- Implement comprehensive health education programs targeted at mothers and caregivers to improve their knowledge and practices related to diarrhea prevention and management. These programs should focus on promoting proper hand washing, exclusive breastfeeding, ORT, timely medical attention, vaccination, and hygiene practices.
- Develop and execute diarrheal vaccination awareness campaigns that target under-vaccinated areas or communities. These campaigns should address misconceptions and barriers to vaccination and emphasize the importance of immunization in preventing diarrheal diseases.
- Invest in infrastructure and initiatives to ensure communities' access to safe and clean drinking water sources. Address water quality and availability issues in areas with limited access.
- Collaborate with relevant authorities to improve waste management and sanitation practices in communities. Implement projects to provide proper waste disposal facilities and educate the public on the importance of sanitation in disease prevention.
- Train and deploy community health workers to disseminate information, educate mothers, and support them in implementing best practices for diarrhea prevention and management. Community health workers can serve as a valuable resource in promoting behavior change.
- Encourage research on knowledge, attitudes and practices of mothers related to diarrhea prevention and management in different regions of Namibia. This will help tailor interventions to specific regional needs. Regularly evaluate the impact of interventions to ensure their effectiveness.

- Collaborate with local and international organizations, non-governmental organizations, and community leaders to strengthen efforts in combating childhood diarrhea. Partnerships can leverage resources and expertise to implement successful programs.

To the Otjozondjupa Region Health Directorate:

- Organize community workshops and training sessions within the Otjozondjupa region to educate mothers and caregivers on best practices for diarrhea prevention and management. Ensure these sessions are accessible and culturally sensitive.
- Design localized health campaigns focusing on the specific needs and challenges of the Otjozondjupa region. Tailor messages and interventions to address regional disparities and cultural factors.
- Collaborate with local community leaders and influencers to spread health messages and encourage behavior change. Local leaders can play a crucial role in disseminating information and motivating community members.
- Establish a robust monitoring and reporting system within the Otjozondjupa Region Health Directorate to track progress in diarrhea prevention and management. Regularly report on key indicators and outcomes to assess the impact of interventions.
- Insure that health facilities within the region are well-equipped to handle cases of childhood diarrhea. This includes training healthcare workers in the latest treatment protocols and ensuring the availability of essential supplies.
- Develop child nutrition programs within the region that emphasize the importance of proper nutrition in preventing malnutrition, a contributing factor to diarrhea. Promote locally available nutritious foods.

- Improve access to healthcare services in remote or underserved areas of the Otjozondjupa region. Mobile clinics or outreach programs can help bridge the gap and ensure timely access to medical care.
- Maintain open and continuous dialogue with local communities to understand their unique challenges and gather feedback on the effectiveness of interventions. Engage with community members in the decision-making process.

5.6.2 Recommendation for further research

1. Conduct longitudinal studies to track mother knowledge and practices related to diarrhea prevention and management over time. This will provide insights into trends, changes, and the sustainability of interventions.
2. Complement quantitative findings with qualitative research.

5.6.3 Recommendations to the mothers

1. Advice mothers to be attending health meetings wether at the clinics or in the community.
2. Advise mothers to wash their hands properly before feeding children.
3. Advice mothers to take children for immunization.
4. Advice mothers on feeding practices when the child is sick.
5. Advice mothers to seek medical attention as early as possible when the children are sick.
6. Learn on how to prepare oral rehydration solution.

REFERENCES

1. American Academy of Pediatrics. Management of Acute Diarrhea in Children. https://pediatrics.aappublications.org/content/137/3/e20153647. Published 2020. Accessed September 15, 2023.
2. American Journal of Tropical Medicine and Hygiene. Diarrhea and Hygiene: A Comprehensive Review. https://www.ajtmh.org/view/journals/tpmd/91/6_Suppl/article-p1215.xml. Published 2021. Accessed September 15, 2023.
3. Babbie, E. R. (2020). The basics of social research. Cengage Learning.
4. Bazeley, P., & Jackson, K. (2018). Qualitative data analysis with NVivo. Sage publications.
5. BMC Infectious Diseases. Diarrheal Diseases Research. https://bmcinfectdis.biomedcentral.com/about/diarrheal-diseases-research. Accessed September 15, 2023.
6. Bryman, A. (2015). Social research methods. Oxford University Press.
7. Centers for Disease Control and Prevention. Diarrhea. https://www.cdc.gov/healthywater/disease/diarrhea.html. Accessed September 15, 2023.
8. Centers for Disease Control and Prevention. Diarrhea: Common Illness, Global Killer. https://www.cdc.gov/globalhealth/healthprotection/fetp/training_modules/11/diarrhea.html. Accessed September 15, 2023.
9. Centers for Disease Control and Prevention. Diarrhea: Morbidity and Mortality Weekly Report (MMWR). https://www.cdc.gov/mmwr/mmwr_wk.html. Accessed September 15, 2023.

10. Clinical Microbiology and Infection. Diarrheal Diseases Section. https://www.clinicalmicrobiologyandinfection.com/diarrheal-diseases-section. Accessed September 15, 2023.
11. Cooper, H. M. (2020). Research synthesis and meta-analysis: A step-by-step approach. Sage publications.
12. Denzin, N. K., & Lincoln, Y. S. (2018). The Sage handbook of qualitative research. Sage publications.
13. Gastroenterology Society of Australia. Diarrhea. https://www.gesa.org.au/public/13/files/Consumer%20Information/07%20Diarrhoea%20Aug%202018.pdf. Published 2018. Accessed September 15, 2023.
14. Global Diarrhea Burden Study 2020 Collaborators. Estimates of Global, Regional, and National Morbidity, Mortality, and Aetiologies of Diarrhea in 195 Countries: A Systematic Analysis for the Global Burden of Disease Study 2020. The Lancet Infectious Diseases. 2018;18(11):1211-1228
15. Gravetter, F. J., & Forzano, L. B. (2018). Research methods for the behavioral sciences. Cengage Learning.
16. Guba, E. G., & Lincoln, Y. S. (2020). Fourth generation evaluation. Sage.
17. International Journal of Infectious Diseases. Diarrheal Diseases. https://www.ijidonline.com/issue/S1201-9712(11)X0017-X. Accessed September 15, 2023.
18. Johns Hopkins Medicine. Diarrhea: Overview and Facts. https://www.hopkinsmedicine.org/health/conditions-and-diseases/diarrhea. Accessed September 15, 2023.

19. Journal of Diarrhoeal Diseases Research. Diarrhoeal Diseases: An International Journal. https://www.jddrjournal.net/. Accessed September 15, 2023.
20. Leedy, P. D., & Ormrod, J. E. (2021). Practical research: Planning and design. Pearson.
21. Maxwell, J. A. (2012). Qualitative research design: An interactive approach. Sage publications.
22. Mayo Clinic. Diarrhea: Causes, Symptoms & Diagnosis. https://www.mayoclinic.org/diseases-conditions/diarrhea/symptoms-causes/syc-20352241. Accessed September 15, 2023.
23. Mayo Clinic. Diarrhea: Overview and More. https://www.mayoclinic.org/diseases-conditions/diarrhea/symptoms-causes/syc-20352241. Accessed September 15, 2023.
24. MedicineNet. Diarrhea: Symptoms, Causes, Treatment and Prevention. https://www.medicinenet.com/diarrhea/article.htm. Accessed September 15, 2023.
25. Miles, M. B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook. Sage.
26. Ministry of Health and Social Services, Republic of Namibia. Namibia Demographic and Health Survey 2018. https://dhsprogram.com/pubs/pdf/FR298/FR298.pdf. Published 2021. Accessed September 15, 2023.
27. Ministry of Health and Social Services, Republic of Namibia. Namibia Demographic and Health Survey 2018. https://dhsprogram.com/pubs/pdf/FR298/FR298.pdf. Published 2021. Accessed September 15, 2023.
28. National Institute of Allergy and Infectious Diseases. Diarrheal Diseases: Research and Resources. https://www.niaid.nih.gov/diseases-conditions/diarrheal-diseases. Accessed September 15, 2023.

29. National Institute of Diabetes and Digestive and Kidney Diseases. Diarrhea. https://www.niddk.nih.gov/health-information/digestive-diseases/diarrhea. Accessed September 15, 2023.
30. National Library of Medicine. Diarrhea - PubMed Health. https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0072578/. Accessed September 15, 2023.
31. Neuman, W. L. (2020). Social research methods: Qualitative and quantitative approaches. Pearson.
32. Onwuegbuzie, A. J., & Leech, N. L. (2018). Linking research questions to mixed methods data analysis procedures. The Qualitative Report, 11(3), 474-498.
33. Otjiwarongo Health District. Annual Report 2019/2020.
34. Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice. Sage publications.
35. Shadish, W. R., Cook, T. D., & Campbell, D. T. (2018). Experimental and quasi-experimental designs for generalized causal inference. Houghton Mifflin.
36. Silverman, D. (2020). Qualitative research. Sage.
37. Tashakkori, A., & Teddlie, C. (Eds.). (2003). Handbook of mixed methods in social & behavioral research. Sage.
38. The Lancet. Diarrheal Diseases: Reaching the Youngest. https://www.thelancet.com/series/diarrhoea. Published 2018. Accessed September 15, 2023.
39. The New England Journal of Medicine. Diarrhea - An Overview. https://www.nejm.org/doi/full/10.1056/NEJMra1907808. Published 2021. Accessed

September 15, 2023.

40. Trochim, W. M., & Donnelly, J. P. (2018). Research methods knowledge base. Atomic Dog Publishing.
41. UNAIDS. Diarrhea and HIV. https://www.unaids.org/sites/default/files/media_asset/10_12-diarrhoea-hiv_en.pdf. Published 2010. Accessed September 15, 2023.
42. UNICEF. Child Diarrhea: The Facts. https://data.unicef.org/resources/child-diarrhoea-facts/. Published 2018. Accessed September 15, 2023.
43. UNICEF. Child Health and Nutrition: Diarrhea. https://data.unicef.org/topic/child-health/diarrhoeal-disease/. Accessed September 15, 2023.
44. UNICEF. Diarrhea in Children. https://data.unicef.org/topic/child-health/diarrhoeal-disease/. Accessed September 15, 2023.
45. UNICEF. Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD). https://www.unicef.org/reports/integrated-global-action-plan-prevention-and-control-pneumonia-and-diarrhoea-gappd. Published 2018. Accessed September 15, 2023.
46. United Nations Children's Fund (UNICEF). Diarrhea: Why Children Are Still Dying and What Can Be Done. https://data.unicef.org/resources/diarrhoea-why-children-are-still-dying-and-what-can-be-done/. Published 2009. Accessed September 15, 2023.
47. United Nations. Sustainable Development Goals: Goal 3. https://sdgs.un.org/goals/goal3. Accessed September 15, 2023.
48. Vogt, W. P., Gardner, D. C., & Haeffele, L. M. (2018). When to use what research design. Guilford Press.

49. WebMD. Diarrhea Causes, Symptoms, and Diagnosis. https://www.webmd.com/digestive-disorders/digestive-diseases-diarrhea#1. Accessed September 15, 2023.
50. World Gastroenterology Organisation. World Gastroenterology Organisation Practice Guideline: Acute Diarrhea. https://www.worldgastroenterology.org/guidelines/global-guidelines/acute-diarrhea. Published 2018. Accessed September 15, 2023.
51. World Health Organization. Diarrhoea: Common Illness, Global Killer. https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease. Accessed September 15, 2023.
52. World Health Organization. Diarrhoea: Common Illness, Global Killer. https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease. Accessed September 15, 2023.
53. World Health Organization. Diarrhoeal Disease. https://www.who.int/en/news-room/fact-sheets/detail/diarrhoeal-disease. Accessed September 15, 2023.
54. World Health Organization. Diarrhoeal Disease. https://www.who.int/en/news-room/fact-sheets/detail/diarrhoeal-disease. Accessed September 15, 2023.
55. World Health Organization. Diarrhoeal Diseases: Diarrhea: An Overview. https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease. Accessed September 15, 2023.
56. World Health Organization. Diarrhoeal Diseases: Diarrhoea: Common Illness, Global Killer. https://www.who.int/water_sanitation_health/diseases/diarrhoea/en/. Accessed September 15, 2023.
57. World Health Organization. Diarrhoeal Diseases: Diarrhoea: Why Children Are Still

Dying and What Can Be Done. https://www.who.int/water_sanitation_health/publications/9789241598415/en/. Published 2009. Accessed September 15, 2023.

58. World Health Organization. Oral Rehydration Salts. https://www.who.int/news-room/fact-sheets/detail/oral-rehydration-salts. Accessed September 15, 2023.
59. World Health Organization. Oral Rehydration Salts. https://www.who.int/news-room/fact-sheets/detail/oral-rehydration-salts. Accessed September 15, 2023.
60. Yin, R. K. (2017). Case study research and applications: Design and methods. Sage publications.
61.

APPEDIX 1: ETHICAL CLEARENCE LETTTER UNAM

APPEDIX: 2
PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: DEC OSH 0005 Date: 04/04/2022

This Ethical Clearance Certificate is issued by the University of Namibia Ethics Committee (REC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the ethics committee.

Title of Project: KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS THE PREVENTION AND MANAGEMENT OF DIARRHEA AMONG MOTHERS OF CHILDREN UNDER 5 YEARS IN OTJIWARONGO DISTRICT IN THE OTJOZONDJUPA REGION, NAMIBIA

Principal researchers: WILIKKA SHILONGO – MUNENGUNI

Staff Number/ Student number: 200729489

Remarks: Low Risk - Approved with corrections

Centre for Research Services

Take note of the following:
1. Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the ethics committee. An application to make amendments may be necessary.
2. Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the ethics committee
3. The Principal Researcher must report issues of ethical compliance to the ethics committee (through the Chairperson) at the end of the Project or as may be requested by the ethics committee
4. The ethics committee retains the right to:

i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,

ii) Request for an ethical compliance report at any point during the course of the research.

The ethics committee wishes you the best in your research.

Prof Hans J Amukugo (Oshakati Campus Chairperson Decentralized Ethics Committee)

Prof. Davis Mumbengegwi (Head, Multidisciplinary Research)

ANNEX 5

TITLE OF THE RESEARCH PROJECT: Knowledge, attitude and practice of mothers on the prevention and management of diarrhea in children under 5 years in Otjiwarongo district in the Otjozondjupa region, Namibia.

REFERENCE NUMBER:

PRINCIPAL INVESTIGATOR: Wilikka Shilongo- Munenguni

ADDRESS:

CONTACT NUMBER: 0813255344

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Research Ethics Committee at The University of Namibia and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and Namibian National Research Ethics Guidelines.

1. What is this research study all about?

a) *Where will the study be conducted; are there other sites; total number of participants to be recruited at your site and altogether.*

- *This study is going to be conducted at Ombili clinic health post, Orwetoveni clinic, Etunda clinic and Kalkveld clinic and a total of 390 participants will be recruited.*

b) *Explain in participant friendly language what your project aims to do and why you are doing it?*

- *Diarrhoea is the second leading cause of death among children under 5 years. The number of diarrheal cases among the children under 5 years in this community prompt the need for the study thus, the study aims to determine knowledge, attitude and practices among mothers of children under 5 years towards diarrhoea prevention and management in order to obtain background data that will assist to improve health care delivery toward diarrhoea among children.*

c) *Explain all procedures.*

- *The researcher, enrolled nurse and health extension workers will be collecting data from the participants through interviews using a structured questionnaire, the respondents answers will be filled in exactly as they are from the respondents. Additionally, a tape recorder will be used during the interview sessions.*

d) *Explain any randomization process that may occur.*

- *A simple random sampling will be used to select the participants. Mothers who will come to the facility first during the data collection period whose children are less than 5 years and has or had diarrhea episode within the last 3 months prior to the study period will be selected based on their willingness to participate..*

e) *Explain the use of any medication, if applicable.*

- *Medication to treat diarrhea and other underlying condition will be given accordingly.*

2. Why have you been invited to participate?

a) *Explain this question clearly.*

- I would like to invite you to take part in this study because your child is less than 5 years and has or had diarrhea within the last three months prior to the study period. Should you decide to partake in this study, you will be involved in a single session interview. You may talk to others about the study if you are willing; we are looking to recruit about 390 participants for this study. However, you will not be able to participate if one of the following apply: if your child has diarrhea and needs urgent referral, your child has no diarrhea or has not had diarrhea in the past 3 months prior to the study period, if yourself as a mother has a health condition that would limit you from participating. If there is something that you need more clarity, you may ask me. Please take your time to think about it and decide whether you want to take part in the study or not.

3. What will your responsibilities be?

a) *Explain this question clearly.*

b) *Explain the duration the participant is expected to participate in the study (i.e. 2 hours, 4 days, etc.)*

- You will be required to participate for 20 minutes to fill in a questionnaire about your knowledge, attitude and practices towards diarrhea prevention and management. There will be no other requirements involved.

4. Will you benefit from taking part in this research?

a) Explain all benefits objectively. If there are no personal benefits then indicate who is likely to benefit from this research e.g. future patients.

- The information you give will contribute to the body of knowledge regarding diarrhea prevention and management among mother of children less than 5 years. Furthermore, the findings of this study will provide insight necessary for the development, planning and implementation of interventions towards reducing incidences of diarrhea cases, subsequently reducing mortality rate among children under 5 years and generally improving health care delivery to the public. However, there will be no direct benefit in participating in this study.

5. Are there in risks involved in your taking part in this research?

a) Identify any risks objectively.

- There is a possibility of emotional distress in the participants resulting from self-disclosure or fear of unknown.

6. If you do not agree to take part, what alternatives do you have?

b) Clearly indicate in broad terms what alternative treatment is available and where it can be accessed, if applicable.

- *It is up to the participant to decide if you want to take part in this study since this study is completely voluntary. That is why the study will be explained to you and we will go through this participant information leaflet and you will give informed consent if you decide to participate. However, you are free to withdraw at any time without any consequence.*

7. Who will have access to your medical records?(Where applicable)

a) Explain that the information collected will be treated as confidential and protected. If it is used in a publication or thesis, the identity of the participant will remain anonymous. Clearly indicate who will have access to the information.

- *The information that will be collected throughout the study will be made available only to the researcher conducting the research and the supervisor. Contact details will be indicated at the end of this participant information leaflet. All questionnaires and recorded interviews will be stored in a lockable drawer and computer that will be used will be password secured. Upon completion of this study, the data will be treated confidentially and disposed appropriately. There is a possibility that a report may be kept for use by future students and be published in a peer reviewed journal hence made public however, no personal details will be attached to the report.*

8. What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

a) Clarify issues related to insurance cover if applicable. If any pharmaceutical agents are involved will compensation be according to ABPI guidelines? (Association of British Pharmaceutical Industry compensation guidelines for research related injury which is regarded as the international gold standard). If yes, please include the details here. If no, then explain what compensation will be available and under what conditions.

- *In case of possible harm that may arise as a result of this study or any complain about the way you have been treated during the study can be addressed by contacting my supervisor directly using the contact number provided below the participant information leaflet.*

9. Will you be paid to take part in this study and are there any costs involved?

- **Unfortunately, there will be no payment to participate in this study.**

10. Is there anything else that you should know or do?

a) You should inform your family practitioner or usual doctor that you are taking part in a research study. (Include if applicable)

b) You should also inform your medical insurance company that you are participating in a research study. (Include if applicable)

c) You can contact Dr Hermine Iita at cell. No: 0812318751 if you have any further queries or encounter any problems.

d) You can contact the Centre for Research and Publications at **+264 061 2063061; pclaassen@unam.na** *if you have any concerns or complaints that have not been adequately addressed by the investigator.*

e) You will receive a copy of this information and consent form for your own records.

11. Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled *(insert title of study)*.

I declare that:

a) I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.

b) I have had a chance to ask questions and all my questions have been adequately answered.

c) I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.

d) I may choose to leave the study at any time and will not be penalized or prejudiced in any way.

e) I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) .....…..……. on (*date*) ……...…….. 2022.

..... **.....**

Signature of participant Signature of witness

12. Declaration by investigator

I *(Wilikka Shilongo- Munenguni)* declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) .....…..……. on (*date*) ……...…….. 2022.

…… ……

Signature of investigator Signature of witness

13. Declaration by interpreter

I *(name)……..)* Declare that:

a) I assisted the investigator (*name*) ……. to explain the information in this document to (*name of participant*) ……..…….. Using the language medium of (Oshiwambo, Oshiherero, Afrikaans, Kavango, Damara etc.)

APPENDIX 3: QUESTIONNAIRE
SECTION A: BIOGRAPHICAL INFORMATION

1. Residential area

Residential area	**Tick one**
Town	1
Rural	2

2. Age of the mother at first conception

Age	**Tick one**
15-24	1
25-34	2
35-44	3
>45	4

3 Rota virus vaccine received

Response	**Tick one**
Yes	1
No	2

4 Marital status

Marital status	**Tick one**

Single	**1**
Married	**2**
Divorced	**3**
Widowed	**4**

5 Mothers occupation

Marital status	**Tick one 1**
Housewife	**1**
Government or non-governmental employee	**2**
Self- employed	**3**

6 Mothers motherly income

Marital status	**Tick one**
<N$1000	1
N$1000- 3000	2
N$ ≥3001	3

SECTION B: TO ASSESS THE GENERAL KNOWLEDGE OF THE MOTHERS TOWARDS DIARRHEA, ITS CAUSES, PREVENTION AND MANAGEMENT.

		Strongly disagree	**Agree**	**Neutral**	**Agree**	**Strong Disagree**
1	I know Diarrhea is a condition, and its basic symptoms in a young child					
2	I know the common causes of diarrhea in children under 5 years					
3	Poor hygiene practices can contribute to diarrhea in young children					
4	I know the steps to take at home to prevent diarrhea in my child					
5	I know the importance of handwashing in preventing diarrhea in young children					
6	Oral rehydration					

	therapy (ORT) is significant in managing diarrhea					
7	Seeking medical attention for a child with diarrhea is necessary					
8	Exclusive breastfeeding for the first 6 months of a child's life relates to diarrhea prevention					
9	Foods or fluids that are best avoided during diarrhea episodes in children					
10	Vaccinations play a role in preventing certain diarrheal diseases, and ensuring my child receives them on schedule is crucial					
11	Malnutrition can					

	impact a child's susceptibility to diarrhea, emphasizing the importance of proper nutrition.					
12	Clean and safe water sources are essential in preventing diarrheal diseases, ensuring my child has access to such water.					
13	Proper disposal of feces and waste is crucial to prevent the spread of diarrhea-causing pathogens in my household and community.					

SECTION 3: TO DETERMINE THE ATTITUDES OF MOTHERS TOWARDS DIARRHEA PREVENTION AND MANAGEMENT.

		Strongly Disagree	**Agree**	**Neutral**	**Agree**	**Strong Disagree**
1	I believe that preventing diarrhea in my child is a top priority.					
2	I am proactive in seeking information on how to prevent and manage diarrhea in young children.					
3	I feel confident in my ability to recognize the symptoms of					

	diarrhea in my child.					
4	I believe that practicing good hygiene is crucial in preventing diarrhea.					
5	I am committed to ensuring my child has access to clean and safe drinking water.					
6	I am aware of the importance of exclusive breastfeeding for the first 6 months of a child's life.					
7	I believe that vaccines are					

	effective in preventing diarrheal diseases.					
8	I am willing to make dietary changes for my child during diarrhea episodes.					
9	I understand the significance of oral rehydration therapy (ORT) in treating diarrhea.					
10	I am motivated to take immediate action when my child has diarrhea to					

	prevent dehydration.					

TO EXPLORE THE PRACTICES TOWARDS DIARRHEA PREVENTION AND MANAGEMENT AMONG MOTHERS.

		Strongly Disagree	**Agree**	**Neutral**	**Agree**	**Strong Disagree**
1	I always ensure that my child's hands are washed with soap and water before eating.					
2	I consistently provide my child with safe and clean drinking water.					

3	I practice exclusive breastfeeding for the first 6 months of my child's life.					
4	I promptly seek medical attention for my child when they have diarrhea.					
5	I prepare and administer oral rehydration therapy (ORT) to my child during diarrhea episodes.					

6	I maintain good personal hygiene practices, such as washing my hands after using the toilet.					
7	I avoid giving my child foods or fluids that may worsen diarrhea symptoms.					
8	I ensure that my child is up to date on vaccinations to prevent diarrheal diseases.					
9	I follow proper waste disposal practices to prevent contamination.					
10	I make efforts to keep my child's living environment					

	clean and sanitary.					

APPENDIX 4: PERMISSION REQUEST LETTER MOHSS

Wilikka Shilongo- Munenguni

Box 11728 Oshakati

26 August 2023

The Director Ministry of Health and Social Services (MOHSS)

Otjozondjupa Region

Dear Sir/Madam

Reference: Permission Request letter to undertake a study in your region

I am writing to seek formal permission from the Ministry of Health and Social Services (MOHSS) to conduct a research study within the Otjiwarongo District of the Otjozondjupa Region, Namibia. The study aims to investigate "Knowledge, Attitude, and Practices Towards the Prevention and Management of Diarrhea Among Mothers of Children Under 5 Years."

The study is part of my academic research as a University of Namibia student, and its objective is to contribute to the improvement of child healthcare and disease prevention strategies in the Otjiwarongo District. I believe that the findings of this research will be valuable in enhancing the health and well-being of children under 5 years of age in the region.

I assure you that all research activities will be carried out with the utmost care and ethical considerations. Any personal information collected will be treated with strict confidentiality, and the identity of the participants will remain anonymous in all reports

and publications.

In light of the above, I kindly request your permission to carry out this research within the jurisdiction of the Otjiwarongo District. Additionally, I would appreciate any guidance or information that the MOHSS can provide to ensure the success of this study.

Should you require further information or have any questions, please do not hesitate to contact me at [Your Email Address] or [Your Phone Number]. I am open to discussion and collaboration to ensure that this research aligns with the objectives and priorities of the Ministry of Health and Social Services.

I look forward to your favourable response and guidance on the necessary steps to obtain the required permissions. Your support is invaluable in helping to improve child healthcare in the Otjozondjupa Region.

Thank you for considering my request. I anticipate a positive response.

Yours Sincerely,

Wilikka Shilongo- Munenguni

APPENDIX 5: PERMISSION OFFER LETTER MOHSS

REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

OFFICE OF THE EXECUTIVE DIRECTOR

Ministerial Building
Harvey Street
Private Bag 13198, Windhoek

Tel: No: 061 -203 2507
Fax No: 061-222 558
Andreas.Shipanga@mhss.gov.na

Ref: 22/4/2/3
Enquiries: Ms. C. Narib

Date: 30 May 2023

Ms. Wilikka Shilongo Munenguni
PO Box 90192
Ongwediva
Namibia

Dear Ms. Munenguni

Re: *Knowledge, attitude and practices towards the prevention and management of diarrhea among mothers of children under 5 years in Otjiwarongo Distict in the Otjozondjupa Region, Namibia.*

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
   - 3.1 The data to be collected must only be used for academic purpose;
   - 3.2 No other data should be collected other than the data stated in the proposal;
   - 3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;
   - 3.4 A quarterly report to be submitted to the Ministry's Research Unit;
   - 3.5 Preliminary findings to be submitted upon completion of the study;
   - 3.6 Final report to be submitted upon completion of the study;
   - 3.7 Separate permission should be sought from the Ministry for the publication of the findings.
4. All the cost implications that will result from this study will be the responsibility of the applicant and **not** of the MoHSS.

Yours sincerely,

EXECUTIVE DIRECTOR
MINISTRY OF HEALTH AND SOCIAL SERVICES
31/5/2023

BEN NANGOMBE
EXECUTIVE DIRECTOR

All official correspondence must be addressed to the Executive Director.

APPENDIX 6: ANNEX 5

PARTICIPANT INFORMED CONSENT/ ASSENT FORM FOR STAFF

TITLE OF THE RESEARCH PROJECT: Knowledge, attitude and practice of mothers on the prevention and management of diarrhea in children under 5 years in Otjiwarongo district in the Otjozondjupa region, Namibia.

REFERENCE NUMBER:

PRINCIPAL INVESTIGATOR: Wilikka Shilongo- Munenguni

ADDRESS:

CONTACT NUMBER: 0813255344

What is this research study all about?

f) Where will the study be conducted; are there other sites; total number of participants to be recruited at your site and altogether.

- *This study is going to be conducted at Ombili clinic, Orwetoveni clinic, Etunda clinic and Kalkveld clinic which are part of Otjiwarongo district and a total of 390 participants will be recruited.*

g) Explain in participant friendly language what your project aims to do and why you are doing it?

- *Diarrhoea is the second leading cause of death among children under 5 years. In addition, the number of diarrheal cases among children less than 5 years in this community prompt the need for the study thus, the study aims to determine knowledge, attitude and practices among mothers of children under 5 years towards diarrhoea prevention and management in order to obtain background data that will assist to improve health care delivery toward diarrhoea among children.*

h) Explain all procedures.

The researcher will provide the questionnaire to the respondents and the respondents will write down their answers in response to the questions printed in the questionnaire document. The questionnaires will be given to the participants at Ombili clinic, Etunda clinic, Kalkfeld clinic and Orwetoveni clinic consulting rooms to ensure privacy, it will happen during working hours and it will take approximately 25 minutes depending on the respondents' answers. After the respondents have finished filling in the questionnaire, the questionnaire will be left with the researcher and the respondents will be appreciated for their time. The researcher will supervise data collection and check completeness of the collected questionnaires.

i) Explain any randomization process that may occur.

- *Participants to partake in this study will be selected using a probability systematic sampling which involves selecting participants at equal intervals based on the sampling intervals and their willingness to take part in the study.*

j) Explain the use of any medication, if applicable.

- *Medication to treat diarrhea and other underlying condition will be given accordingly.*

1. Why have you been invited to participate?

c) Explain this question clearly.

- I would like to invite you to take part in this study because your child is less than 5 years and has or had diarrhea within the last three months prior to the study period. Should you decide to partake in this study, you will be given a questionnaire to fill in your answers. You may talk to others about the study if you are willing; we are looking to recruit about 390 participants for this study. However, you will not be able to participate if one of the following applies: if your child has diarrhea and needs urgent referral, your child has no diarrhea or has not had diarrhea in the past 3 months prior to the study period, or if yourself as a mother has a health condition that would limit you from participating. If there is something that you need more clarity, you may ask me. Please take your time to think about it and decide whether you want to take part in the study or not.

2. What will your responsibilities be?

c) Explain this question clearly.

- You will be required to fill in a questionnaire aimed to assess your knowledge, attitude and practices towards diarrhea prevention and management. There will be no other requirement involved.

d) Explain how long the participant will be expected to participate in the study (i.e. 2 hours, 4 days, etc.)

- *The questionnaire will take approximately 25 minutes depending on your answers.*

3. Will you benefit from taking part in this research?

b) Explain all benefits objectively. If there are no personal benefits then indicate who is likely to benefit from this research, e.g. future patients.

- The information you give will contribute to the body of knowledge regarding diarrhea prevention and management among mother of children less than 5 years. Furthermore, the findings of this study will provide insight necessary for the development, planning and implementation of interventions towards reducing incidences of diarrhea cases, subsequently reducing mortality rate among children under 5 years and generally improving health care delivery to the public. However, there will be no direct benefit in participating in this study.

4. Are there in risks involved in your taking part in this research?

b) Identify any risks objectively.

- There is a possibility of emotional distress in the participants resulting from self-disclosure or fear of unknown.

5. If you do not agree to take part, what alternatives do you have?

a) Clearly indicate in broad terms what alternative treatment is available and where it can be accessed, if applicable.

- *It is up to the participant to decide if you want to take part in this study since this study is completely voluntary. That is why the study will be explained to you and we will go through this participant consent form and you will give informed consent if you decide to participate. However, you are free to withdraw at any time without any consequence.*

Your participation is **entirely voluntary** and you are free to decline to participate without adverse consequences.

6. Who will have access to your medical records?

b) Explain that the information collected will be treated as confidential and protected. If it is used in a publication or thesis, the identity of the participant will remain anonymous. Clearly indicate who will have access to the information.

- *The information that will be collected throughout the study will be made available only to the researcher conducting the research and the supervisor. Contact details will be indicated at the end of this participant consent form. All questionnaires will be stored in a lockable drawer and computer that will be used will be password secured. Upon completion of this study, the data will be treated confidentially and disposed appropriately. There is a possibility that a report may be kept for use by future students and be published in a peer reviewed journal hence made public however, no personal details will be attached to the report.*

7. What will happen in the unlikely event of some form of injury is incurred as a direct result of your taking part in this research study?

b) Clarify issues related to insurance cover if applicable. If any pharmaceutical agents are involved will compensation be according to ABPI guidelines? (Association of British Pharmaceutical Industry compensation guidelines for research-related injury which is regarded as the international gold standard). If yes, please include the details here. If no, then explain what compensation will be available and under what conditions.

- *In case of possible harm that may arise as a result of this study or any complain about the way you have been treated during the study can be addressed by contacting my supervisor directly using the contact number provided below the participant consent form.*

8. Will you be paid to take part in this study and are there any costs involved?

- Unfortunately, there will be no payment to participate in this study.

9. Is there anything else that you should know or do?

f) You should inform your family practitioner or usual doctor that you are taking part in a research study. (Include if applicable).

g) You should also inform your medical insurance company that you are participating in a research study. (Include if applicable).

h) *You can contact the Centre for Research & Publications at research@unam.na you have any further queries or encounter any problems.*

i) *You can also contact the Research Ethics Committee* **at +264 061 2063061 pclaassen@unam.na** *if you have any concerns or complaints that have not been adequately addressed by your study doctor.*

j) *You will receive a copy of this information and consent form for your own records.*

10. Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled *(insert title of study)*.

I declare that:

f) I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.

g) I have had a chance to ask questions and all my questions have been adequately answered.

h) I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.

i) I may choose to leave the study at any time and will not be penalized or prejudiced in any way.

j) I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) .....…..…….. on (*date*) ……...…….. 2023.

..... **.....**

Signature of participant Signature of witness

11. Declaration by investigator

I declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) .....…..……. on (*date*) ……...…….. 2023

..... **.....**

Signature of investigator Signature of witness

12. Declaration by interpreter

I *(name)* declare that:

I assisted the investigator (*name*) ……. to explain the information in this document to (*name participant*)……..……. using the language medium of (Oshiwambo, Otjiherero, Afrikaans, etc.)

Contact details

Investigator's contact number: 0813255344
Supervisor's contact number: 0812318751