# FACTORS INFLUENCING THE HOME-BASED MANAGEMENT OF DIARRHOEA IN CHILDREN UNDER FIVE YEARS IN THE RURAL MATZIKAMA SUB DISTRICT IN THE WESTERN CAPE.

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# DECLARATION

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# ABSTRACT

The high incidence of diarrhoea in children under five years of age is a great concern and becomes a priority to decrease the level of child morbidity and mortality worldwide. The aim of this study was to investigate the factors influencing the home-based management of diarrhoea in children under five in the rural Matzikama sub district in the Western Cape. The objectives for the study were to determine whether the following factors influenced the home-based treatment of diarrhoea: demographical factors; socio-economic factors; the knowledge of mothers and caregivers about the home-based management of diarrhoea; and the participant's previous involvement with the management of diarrhoea.

A quantitative approach with a descriptive design was applied in the study. A total population of N=195 of mothers and caretakers of children under five were included in the study obtained through convenient sampling. The data collection instrument was a self-administered questionnaire. A structured interview was conducted with the participants with limited literacy skills. Reliability and validity were ensured by a pilot study done in Klawer Clinic in the Matzikama Sub-District and furthermore assisted by primary health care experts, the study supervisor and co-supervisor, and a statistician from the University of Stellenbosch.

Ethics approval was granted by the Health Research Committee of Stellenbosch (S14/05/120). Permission was obtained from the Health Department of the Western

Cape Government to conduct the research in the Vredendal-North and Vredendal-Central clinics in the Matzikama Sub-District in the West Coast District. (WC_2014RP59_660). Informed written consent was obtained from the participants.

With the support of a qualified statistician at the Stellenbosch University data was analysed using the STATA 14 computer software program. Descriptive statistical analysis was applied, cross tabulation between the biographical data and the successful treatment of diarrhoea at home was done applying the Fisher's exact probability test. The results of the data were presented in tables and bar graphs.

A response rate of 100% was obtained. The categorical data of nominal variables did not fall into any rankable order, therefore no arithmetical calculations like addition, subtraction, multiplication or division could be performed. The identified factors that indicated a statistical significant difference between the successful home-based treatment of diarrhoea in this study were: the number of people in the house ($p=0.003$); the information source on the management of diarrhoea ($p=0.005$); and the successful treatment versus the unsuccessful treatment of diarrhoea at home ($p=0.000$). Based on the demographical variables, the knowledge level on diarrhoea is poor. Results further show that only 21% of participants knew the correct answers on the knowledge-based questions, while 79% answered incorrectly. The study showed no statistical significant difference between the knowledge-based questions and the age, gender and highest school grade passed.

Recommendations for this study include: training about the management of diarrhoea at home-based level for community care workers, mothers and caregivers, and health care workers; social mobilization on awareness of diarrhoea; and family and health care support to mothers and caregivers in the management of diarrhoea at home-based level. The implementation of these recommendations may lead to the reduction of child morbidity and mortality.

**Key words:** Diarrhoea, morbidity, mortality, home- based management, caregivers.

# OPSOMMING

Die hoë voorkoms van diarree in kinders onder die ouderdom van vyf jaar is kommerwekkend en raak 'n prioriteit om kindermorbiditeit en -mortaliteit wêreldwyd te verminder. Die doel van hierdie studie was om die faktore wat die tuis-gebaseerde behandeling van diarree in kinders onder die ouderdom van vyf jaar in die landelike omgewing van die Matzikama subdistrik in die Wes-Kaap beïnvloed, te ondersoek. Die doelwitte vir die studie was om te bepaal of die volgende faktore die tuis-gebaseerde behandeling van diarree beïnvloed: demografiese faktore; sosio-ekonomiese faktore; die kennis van moeders en versorgers oor die tuis-gebaseerde behandeling van diarree; en die deelnemer se vorige betrokkenheid by die tuis-gebaseerde hantering van diarree.

'n Kwantitatiewe benadering met ’n beskrywende ontwerp is toegepas in die studie. 'n Totale bevolking van N = 195 van moeders en versorgers van kinders jonger as vyf jaar was deur ’n gerieflike steekproefmetode in die studie ingesluit. Die data versamelingsinstrument was 'n selftoegediende vraelys. ‘n Gestruktureerde onderhoud was gevoer waar deelnemers ’n mate van ongeletterdheid getoon het. Betroubaarheid en geldigheid is verseker deur 'n steekproefstudie te doen in die kliniek in Klawer, in die Matzikama subdistrik en verder geassisteer deur kenners op die gebied van primêre gesondheidsorg, die studieleier en mede-studieleier, asook 'n statistikus aan die Universiteit van Stellenbosch.

Etiese goedkeuring is verleen deur die Gesondheidsnavorsingsetiekkomitee aan Stellenbosch (S14/05/120). Toestemming is verkry vanaf die Departement van Gesondheid van die Wes-Kaapse regering om die navorsing in die Vredendal-Noord en Vredendal-Sentraal klinieke in die Matzikama Sub distrik in die Weskusdistrik te doen. (WC_2014RP59_660). Ingeligte skriftelike toestemming is verkry van die deelnemers.

Met die ondersteuning van 'n gekwalifiseerde statistikus by Stellenbosch Universiteit is data ontleed met behulp van die STATA 14 rekenaarsagteware program. Beskrywende statistiese ontleding is toegepas, kruistabulasie tussen die biografiese data en die suksesvolle tuis-gebaseerde behandeling van diarree is gedoen, en die Fisher se presiese waarskynlikheidstoets is toegepas. Die resultate van die data is in tabelle en staafgrafieke aangebied.

'n Reaksie-tempo van 100% is verkry. Die kategoriese data van nominale veranderlikes val nie in enige opvolgende orde nie, dus kon daar geen aritmetiese berekeninge soos byvoeging, aftrek, vermenigvuldiging of verdeling uitgevoer word nie.Die geïdentifiseerde faktore wat 'n statistiese beduidende verskil tussen die suksesvolle tuis-gebaseerde behandeling van diarree in hierdie studie aangedui het, is: die aantal mense in die huis ($p = 0.003$); die bron van inligting oor die bestuur van diarree ($p = 0.005$); en die suksesvolle behandeling teenoor die onsuksesvolle behandeling van diarree by die huis ($p = 0.000$). Gebaseer op die demografiese veranderlikes, is die kennisvlak van diarree swak. Resultate het verder getoon dat slegs 21% van deelnemers het geweet wat die korrekte

antwoorde op die kennis-gebaseerde vrae is, terwyl 79% dit verkeerd beantwoord het. Die studie het getoon dat daar geen statistiese beduidende verskil tussen die kennisgebaseerde vrae en die ouderdom, geslag en hoogste skoolgraad geslaag, is nie.

Aanbevelings vir hierdie studie sluit in: opleiding oor die tuis-gebaseerde hantering van diarree vir gemeenskapsorg-werkers, moeders en versorgers; maatskaplike mobilisering oor die bewustheid van tuisgebaseerde hantering van diarree; en familie en gesondheidsorg ondersteuning aan moeders en versorgers met die tuisgebaseerde hantering van diarree. Die implementering van hierdie aanbevelings mag lei tot die vermindering van kindermorbiditeit en -mortaliteit.

**Sleutelwoorde:** Diarree, morbiditeit, mortaliteit, tuisgebaseerde bestuur, versorgers.

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# ABBREVIATIONS

| | |
|---|---|
| **APP** | Annual Performance Plan |
| **CFR** | Case Fatality Rate |
| **DGAP** | Diarrhoea Global Action Plan |
| **GAPP** | Global Action Plan for Pneumonia |
| **HBM** | Health Believe Model |
| **IMCI** | Integrated Management of Childhood Illness |
| **MDG** | Millennium Development Goal |
| **ORS** | Oral Rehydration Solution |
| **ORT** | Oral Rehydration Therapy |
| **SDG** | Sustainable Development Goal |
| **SLT** | Social Learning Theory |
| **SSS** | Sugar-Salt-Solution |
| **WHO** | World Health Organisation |

# CHAPTER 1:
# FOUNDATION OF THE STUDY

## 1.1 INTRODUCTION

According to Shah, Ahmed, Khalique, Afzal, Ansari and Khan (2012:141), adequate management of diarrhoea is essential to reach the fourth Millennium Development Goal (MDG 4) for a reduction in the mortality rates in children younger than five years by two-thirds between 1990 and 2015. The Sustainable Development Goal (SDG) 3 followed on the MDG4, which ensures healthy lives for all people, by reducing the under-five mortality rate by 75% in 2015 to 2030, and to the barest minimum by 2040 (Conforth, Becuwe & Sconfienza 2014:9).

Worldwide, deaths from diarrhoea of children under 5 years were projected at 1.87 million, approximately 19% of total child deaths. WHO African and South-East Asian Regions together, account for 78% (1.46million) of all diarrhoea deaths occurring among children in the developing world. According to Boschi-Pinto, Velebit and Shibuya (2008:710), 73% of these deaths are concentrated in just 15 developing countries. Bhutta, Zipursky, Wazny, Levine, Black, Basani, Shantosham, Freedman, Grange, Kosetc, Keenan, Petri, Campbelle and Rudan (2013:1) found in their study that diarrhoea is globally one of the leading causes of child mortality, which contributed in 2010 to more than 800 000 deaths in children under five years of age.

In South Africa, guidelines and protocols such as the Integrated Management of Childhood Illness 2014 (IMCI) were introduced to simplify the treatment of diarrhoea by health care professionals. However, for the purpose of this study the researcher will explore various factors which could influence the home-based management of diarrhoea. The study will be conducted in the rural Matzikama Sub-District in the West Coast district of the Western Cape.

## 1.2 SIGNIFICANCE OF THE PROBLEM

Cooke, Nel and Cotton (2013:2) indicated that diarrhoeal disease is responsible for over 10 000 deaths annually in South Africa, and that effective home-based management of diarrhoea can contribute towards the reduction of child morbidity and mortality in South Africa, especially in the rural setting.

Children under the age of five are one of the most vulnerable groups in health care. The outcome of this study will make policymakers of health care aware of the factors contributing to home-based management of diarrhoea which may sometimes result in the death of children under the age of five years. Furthermore, to achieve the SDG3 after 2015 and beyond, this contribution will not only benefit this country but may contribute to reducing diarrhoea among children under five years of age globally.

## 1.3 RATIONALE

Njeri and Muriithi (2008-9:78) reported that the World Health Organization declared that the burden of childhood diarrhoea varies from one developing country to another, with the greatest burden in Africa and South Asia. Statistics show that in Africa and South Asia 80% of all child deaths are caused by diarrhoea, while in Africa alone, it is 19% (Njeri & Muriithi, 2008-9: 78). According to McKerrow and Mulaudzi (2010:63, 65) acute diarrhoea is ranked third (3rd) of the five causes of death in hospitals in South Africa, with the most deaths in Gauteng and KwaZulu-Natal.

**Table 1.1: Diarrhoea admissions, deaths and case fatality rate in children under 5 by province, 2014/2015**

| Province | Admissions | Deaths | CFR % |
|---|---|---|---|
| Eastern Cape | 6784 | 351 | 5.2 |
| Free State | 2468 | 100 | 4.1 |
| Gauteng | 3688 | 108 | 2.9 |
| KwaZulu-Natal | 11578 | 347 | 3.0 |
| Limpopo | 5278 | 246 | 4.7 |
| Mpumalanga | 3596 | 189 | 5.3 |
| Northern Cape | 1618 | 55 | 3.4 |
| North West | 3073 | 105 | 3.4 |
| Western Cape | 7704 | 12 | 0.2 |
| **SOUTH AFRICA** | **45787** | **1513** | **3.3** |

According to the latest District Health Barometer 2014/2015:50-53 only 12 deaths of diarrhoea were reported in the Western Cape with a case fatality rate (CFR) of 0.14 in the West Coast district.

Approximately 300 children were admitted to Red Cross Children's Hospital in Cape Town between November and December 2012, while 2 500 children were treated at local clinics for moderate to severe dehydration due to diarrhoea. Among these children, two died who were under the age of five years (Virchow 2013:1). During the diarrhoea season of November 2012 to May 2013, 209 children under the age of five years were admitted to the Vredendal Hospital in the Matzikama Sub district. No deaths due to diarrhoea were reported in this period. (Vredendal Hospital 2013).

Table 1.2 shows the statistics of admissions of diarrhoea in children younger than five years over the past four and a half years at the Vredendal Hospital, the only hospital in the Matzikama Sub-District (Sinjani-statistics, Vredendal Hospital 2016).

**Table 1.2: Admissions of children under five with diarrhoea over the last four years and six months at Vredendal hospital**

| Admissions of diarrhoea in children under five | | | |
|---|---|---|---|
| **Year** | **With dehydration** | **Deaths** | **Total** |
| 2012 | 301 | 0 | 301 |
| 2013 | 301 | 0 | 301 |
| 2014 | 267 | 0 | 267 |
| 2015 | 152 | 0 | 152 |
| 01/01/2016-01/06/2016 | 80 | 0 | 0 |

Table 1.3 shows the admissions of diarrhoea cases of children under five in the clinics in Vredendal, in the Matzikama Sub-District (the mobile clinic is part of the Vredendal Central clinic), (Sinjani-statistics, Vredendal Hospital 2016). The high numbers in admissions indicate that mothers and caretakers first seek medical help at the clinics before treating their children at home.

**Table 1.3: Diarrhoea attendance of children under 5 at the Vredendal Clinics from 01/01/2012- 01/05/2016**

| | **Vredendal-North** | **Vredendal Central** | **Vredendal Mobile** | **Total** |
|---|---|---|---|---|
| With dehydration | 32 | 13 | 0 | 45 |
| Without dehydration | 401 | 153 | 3 | 557 |
| Diarrhoea | 433 | 166 | 3 | 602 |

Masangwi, Grimason, Morse, Kazembe, Ferguson and Jebu (2012:955) substantiate in their study in Southern Malawi that trustworthy mothers have inadequate knowledge both in the preventative measures and the causes of diarrhoea. A study done in rural Botswana, revealed that being a grandmother as a caretaker, was a negative interpreter of household availability of Oral Rehydration Solution (ORS) , while participants who had adequate knowledge about ORS preparation were more likely to have ORS available at home. (Jammalamadugu, Mosime, Masupe and Habte, 2013:3).

According to Njeri and Muriithi (2008-9:80) household factors such as income, the size of the household, place of residence, present gender and the occupation of the household's head are equally important in explaining child health outcomes. Several barriers in Nepal regarding the treatment and prevention of diarrhoea were explored (Ansari, Ibrahim, Hassali, Shanar, Koirala and Thapa, 2012:576). These factors are:

- financial weakness to provide for the effective nutrition;
- lack of awareness to recognize the signs of acute diarrhoea;
- absence of education to understand information and not being able to read what there is to know about diarrhoea;
- distance and accessibility of health facilities to seek medical help if home-treatment of diarrhoea fails;

- senior members at home who compelled mothers of children with diarrhoea to visit traditional healers, believing that diarrhoea has a supernatural origin, while it can successfully be treated at home.

In addition, Pahwa, Kumar and Toteja (2010:558), identified that poor environmental hygiene, low literacy level and poor awareness of residents, adversely affect the management of diarrhoea in the slum areas of Delhi, India.

In a study conducted in Prague, Gzech Republic, by Kudlova (2010:510-515) a lack of knowledge in the “home management of acute diarrhoea” and the use of ORS were identified among caregivers of children between 6 and 59 months.

Studies also show that the incidence of diarrhoea is higher in overcrowded households and low class residential areas. Siziya, Muula and Rutlatsikira (2013:376) show in their study conducted in Sudan that children living in households with one or two people per room were 8% less likely to have diarrhoea than children from households with more than three people per room. Osumanu (2007:59-68) reported that children from indigenous residential areas in Ghana had eight times more diarrhoea than children from the high class residential areas.

## 1.4 RESEARCH PROBLEM

As described, the high incidence of diarrhoea in children younger than five years of age becomes a priority of concern in order to decrease the level of child morbidity and mortality worldwide. Influencing factors, such as home–based management of

diarrhoea that contribute to this problem required an investigation into factors influencing the home-based management of diarrhoea in children under the age of five years in the rural Matzikama sub district in the Western Cape in order to reduce diarrhoea admissions to Vredendal hospital.

## 1.5 RESEARCH QUESTION

The research question that guided this study was: “What are the factors influencing the home-based management of diarrhoea in children under the age of five years in the rural Matzikama sub district, West Coast district in the Western Cape?

## 1.6 RESEARCH AIM

The aim of this study was to investigate the factors influencing the home-based management of diarrhoea in children under five years of age in the rural Matzikama sub district, West Coast district in the Western Cape.

## 1.7 RESEARCH OBJECTIVES

The objectives for this study were to explore whether the following factors influenced the home-based management of diarrhoea in the rural Matzikama sub district, West Coast district in the Western Cape:

- Demographical factors
- Socio-economic factors
- The knowledge of mothers and caregivers about home-based management of diarrhoea.

Participant's previous involvement with the management of diarrhoea.

## 1.8 CONCEPTUAL FRAMEWORK

Burns and Grove (2011:238) describe a conceptual or theoretical framework as an abstract, logical structure of meaning which guides the development of a study and enables the researcher to link the findings. The conceptual framework and the application to this study will be discussed in the next chapter.

The **Health Believe Model** (HBM) was adapted by the researcher for this study. The HBM was one of the first models of health-promoting behaviours and explains health behaviours from a psychological perspective using theories of value-expectancy and decision making. The HBM was first developed during the early 1950s in the United States of America (US) by certain psychologists working in the US public health service (Tarkang & Zotor 2015:3). If health-promoting behaviour becomes positive in treating diarrhoea**,** fewer children will die or be hospitalised. A change to a positive behaviour will promote a desired outcome for treating diarrhoea.

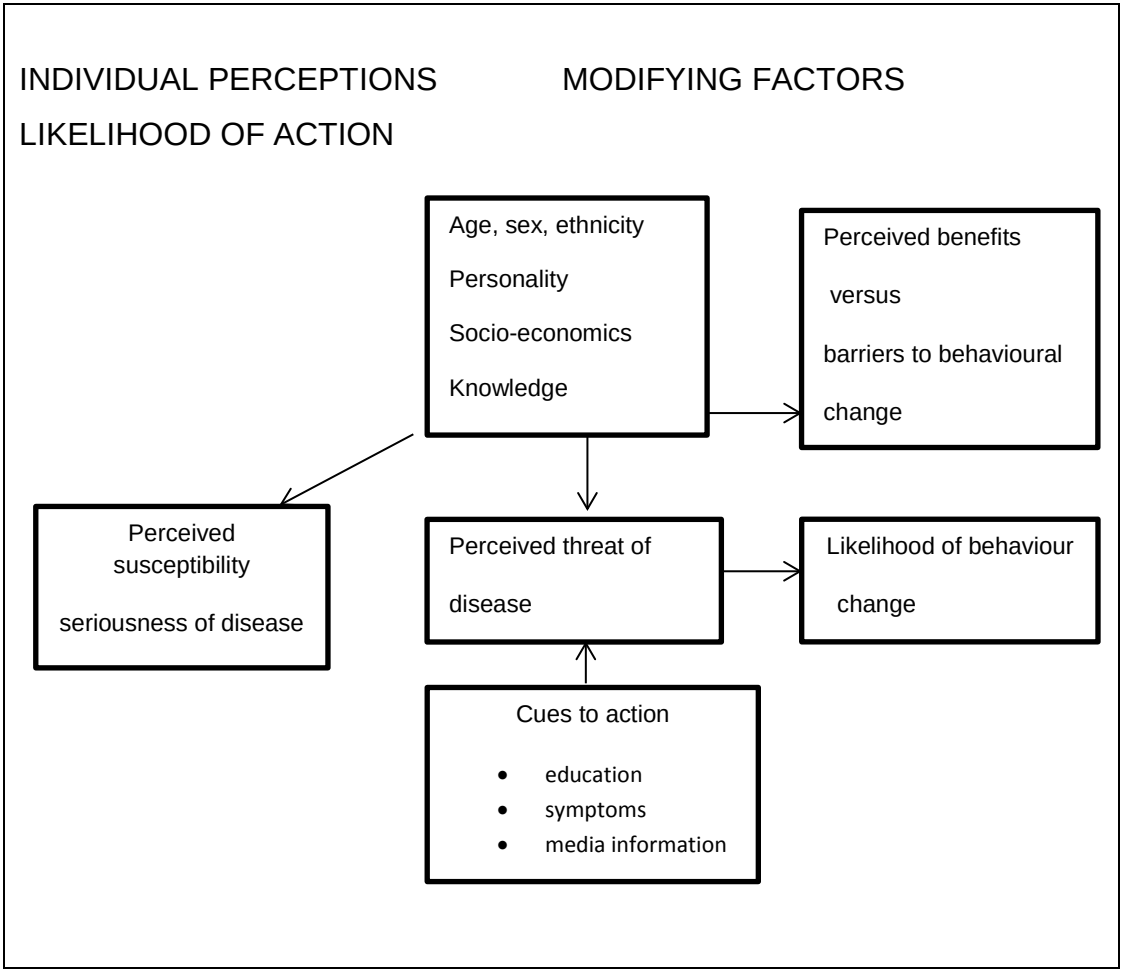


**Figure 1.1 Conceptual Theoretical Model: Health Believe Model**

(Tarkang & Zotor, 2015:4)

Murphy (2005:7) explains that **The Social Learning Theory** (SLT) underlines behavioural capability: Mothers and caretakers need to know what to do and how to do it. Training and clear guidelines may not be adequate enough; therefore the SLT considers self-efficacy: the confidence for caregivers to make personal decisions to bring out the desired change about healthy behaviours.

## 1.9 RESEARCH METHODOLOGY

In this chapter a brief overview of the research methodology which was applied in this study is described, with more detail described in chapter three.

### 1.9.1 Research Design

A quantitative approach with a descriptive design was applied to investigate the factors influencing the home-based management of diarrhoea in children under five years of age in a rural setting.

### 1.9.2 Study Population and Sampling

The target population consisted of mothers and caregivers of all the children younger than five years attending the two main clinics in Vredendal in the Matzikama Sub district. The total population of all children under five years (N= 1950) was obtained from all the births recorded in the birth registers of 2009 to 2013 of the two main clinics in Vredendal in the Matzikama Sub district. A representative sample of 10% was drawn from each clinic.

### 1.9.3 Inclusion criteria

Mothers and caregivers 18 years and older of children under five years of age attending the two main clinics in Vredendal in the Matzikama sub-district were included.

### 1.9.4 Exclusion criteria

Mothers and caregivers younger than 18 years with children younger than five years were excluded from the study, as well as mentally incapacitated caretakers and children older than five years.

### 1.9.5 Instrumentation

A self-administered questionnaire based on the objectives of the study which includes all factors influencing the treatment of diarrhoea was developed.

### 1.9.6 Pilot Study

A pilot study was conducted to improve the reliability and validity of the study by testing the methodology which includes the instrument.

### 1.9.7 Reliability and Validity

#### *1.9.7.1 Reliability*

The reliability of the study was assured through conducting a pilot study which was conducted in the same manner to that of the actual research study. All data was collected by the researcher in structured interviews with the participants.

#### *1.9.7.2 Validity*

The face, construct and content validity were assured through the reviews of experts in primary health care, supervisors, a statistician and by completing a pilot study.

### 1.9.8 Data Collection

The researcher personally collected the data with the use of a questionnaire at each of the identified clinics in Vredendal in the Matzikama Sub district. Some of the participants were less literate; therefore a structured interview was used to assist in the completing of the questionnaires.

### 1.9.9 Data analysis and interpretation

With the support of a qualified statistician at Stellenbosch University, data was analysed by using the cross-tabulation log between all the variables and the successful home-based treatment of diarrhoea in children under five in the rural setting.

## 1.10 ETHICAL CONSIDERATIONS

### 1.10.1 Constitutional right

Chapter two of the Constitution of the Republic of South Africa includes the Bill of Rights, which sets out the human rights that apply to everyone. The following rights are relevant to health care workers and patients: the right

(a) to be treated fairly and equally and free of discrimination;

(b) to life;
(c) to respect and protection of dignity;
(d) to freedom and security of the person;
(e) to privacy;
(f) to freedom of scientific research;
(g) of access to information;
(h) to be treated fairly and to be given reasons by administrative bodies;
(i) to a healthy environment;
(j) of access to health care within available resources;
(k) not to be refused emergency medical treatment; and
(l) of children to security, basic nutrition, and basic health and social services (McQuoid-Mason & Dada 2012:70, 33-34).

Ethics approval to conduct the study was obtained from the Health Research Ethics Committee at Stellenbosch University, reference number: S14/05/120 (Annexure 1).

In addition, the researcher obtained permission from the Western Cape Provincial Health Research Committee to conduct the study, as well as from the operational managers in the Vredendal clinics in the Matzikama Sub district, reference number:

WC_2014RP59_660 (Annexure 2).

A Xhosa-speaking counsellor assisted in the interviewing of Xhosa participants in the presence of the researcher and signed as a witness when obtaining informed consent from the participants.

### 1.10.2 Voluntary participation

Participation of the respondents of the study was not obligatory. Informed written consent was obtained from the participants after a full explanation about the purpose of the study and that participation was voluntary without any repercussions should they decline or withdraw from the study.

### 1.10.3 Anonymity

As a guarantee of anonymity, they were informed that there was an option to withdraw from the study at any given time. Participants completed the questionnaires without writing their names on it.

### 1.10.4 Privacy

A counsellor assisted the researcher in dealing with any emotional distress of a participant taking part in the study. To ensure privacy, a consultation room in the clinic was set aside for the participants to complete the questionnaire.

### 1.10.5 Confidentiality

The assurance of confidentiality was established by the accessibility to the collected data only by the researcher, statistician, supervisor and co-supervisor.

Data will be kept in a locked cupboard for five years once the analysis is completed. All rights to participate in the research were honored.

### 1.10.6 Beneficence and Non-maleficence

McQuoid-Mason and Dada (2012:31) define beneficence as an ethical principle that imposes a duty on health-care workers to do good for their patients. Non-maleficence refers to the act not to inflict evil or harm; or intentionally refraining from activities that can cause harm (Pera & Van Tonder, 2012:55). A counsellor was appointed in the event that the participant was emotionally disturbed. Participants were not exposed to any physical or psychological harm.

## 1.11 OPERATIONAL DEFINITIONS

**Diarrhoea** is defined as the passage of three or more watery stools in 24 hours according to the World Health Organization (WHO), (2013:330).

**Morbidity**, as defined by the WHO (2013:1) is the rate of incidence of a disease in a population.

**Mortality** is the number of actual deaths in a particular situation or period of time (Hornby, 2010:961).

**Integrated Management of Childhood Illnesses** is a strategy developed by the World Health Organisation's Division of Child and Development and UNICEF. The strategy focuses on the child as a whole, rather than a single disease. Sick children

often arrive at primary health care facilities with a number of diseases or illnesses and have to be managed in an integrated manner at home and at the clinic. (Department of Health, Western Cape Government 2016).

**Caregivers** are described as people who provide help to another person in need. The person receiving care may be an adult - often a parent or a spouse - or a child with special medical needs. Some caregivers are family members (U.S. National Library of Medicine 2016).

According to the National guideline of **Home-based Care** (2016) it is defined by the World Health Organization (WHO), as the provision of health services by formal and informal caregivers in the home in order to encourage, restore and maintain a person's maximum level of comfort, function and health. Home care services can be classified into preventive, promotive, therapeutic, rehabilitative, long-term maintenance and palliative care categories.

**Case Fatality Rates** for the priority childhood illnesses (pneumonia, diarrhoea and severe acute malnutrition), is the proportion of all children younger than 5 years admitted to hospital with these conditions that die during the admission (District Health Barometer, 2014/2015: 49).

## 1.12 DURATION OF THE STUDY

Approval from Ethics Committee of the University of Stellenbosch was granted on 18 June 2014 and approval from Department of Health Ethics Committee was only

granted on 08 April 2015. Data collection was completed on 12 June 2015 and data analysing completed at the end of July 2015. The final thesis was submitted in November 2016.

## 1.13 CHAPTER OUTLINE

**Chapter 1: Scientific foundation of the study**

In this chapter a brief introduction, rationale, the objectives and a brief overview of the methodology as applied in the study, including the ethical considerations are described.

**Chapter 2: Literature review**

A literature review based on the objectives and related to research about the factors influencing the home-based management of diarrhoea in children under five in the rural setting are described.

**Chapter 3: Research methodology**

A more in-depth description of the research methodology which includes the design, population, research setting, instrumentation and data analysis are discussed in this chapter.

**Chapter 4: Results**

The results of the data analysis are described in this chapter.

**Chapter 5: Discussion, conclusions and recommendations**

In this chapter the conclusions and recommendations are described based on the scientific evidence obtained in this study.

## 1.14 SUMMARY

The foundation of this study includes the significance; the rationale; the research problem; the research question; the aim; the objectives; the conceptual framework; the research methodology; ethical considerations; operational definitions; as well as the duration and the chapter outline of the study. The conceptual framework is based on the Health Believe Model and the Social Learning Theory.

## 1.15 CONCLUSION

Diarrhoea in children under five years of age can be fatal if mothers and caregivers do not know how to manage diarrhoea at home. Admissions of children under five with diarrhoea at the Vredendal hospital in the Matzikama Sub-District is an indicator that diarrhoea management at home is not effective. The literature review is discussed in chapter two.

# CHAPTER 2:
# LITERATURE REVIEW

## 2.1 INTRODUCTION

Diarrhoea is defined as having three or more watery stools within 24 hours and is the second leading cause of 1.5 million deaths in the world among children younger than five years (Essomba, Koum, Adiogo, Ngwe & Coppieters 2015:60).

Grove, Burns and Gray (2013:97) describe the literature review as an organized written presentation of what you find when you review the literature and it summarizes what has been published on a topic. The relevant literature was reviewed as referred to in this chapter about factors influencing the home-based management of diarrhoea in children under five years of age in the rural setting.

## 2.2 REVIEWING AND PRESENTING THE LITERATURE

The timeframe of literature reviewed, was published between 2007 and 2016. Various studies globally were explored by the researcher regarding diarrhoea in children under five in the rural setting. The researcher could only find one source on a study that was conducted in the rural setting of the West Coast in the Western Cape of South Africa.

The literature search was conducted by using the following sources: PubMed, Cinahl, Medline, Science Direct, relevant electronic journals, articles and theses.

## 2.3 FINDINGS FROM THE LITERATURE

The findings from the literature reviewed are discussed under the following headings:

- Child mortality and mobility
- Knowledge of mothers and caregivers
- Education level
- Socio-demographic factors
- Seeking Medical Care
- Home-based treatment

### 2.3.1 Child mortality and morbidity

The Sustainable Developmental Goal 3 sets out to ensure healthy lives and promote the well-being for all at all ages, which include:

- reducing the global mortality ratio to less than 70 per 100 000 live births as well as;
- ending preventable deaths of newborns and children under five years old; and it follows up on the 2015-MDG for the next 15 years (Herman 2015:5).

In a similar article by Walker, Rudan, Nair, Theodoratou, Bhutta, O'Brien, Campbell and Black (2013:1405), to achieve the MDG 4 of the reduction of child mortality to

20 deaths or fewer per 1 000 live births globally by 2035, will require substantial decreases in mortality from diarrhoea and pneumonia. This study also declared the highest numbers of childhood deaths in Sub-Saharan Africa, where 50% died of diarrhoea and 43% from pneumonia in 2011. China reached 12% for both diseases, while other African countries have rates that are much less than the MDG target rate of 4.4%. In Burkina Faso mortality fell from 2000 to 2010, yet the estimated total number of deaths in children under five has increased, from 13 447 to 14 648 for diarrhoea and 17 389 to 21 763 for pneumonia (Walker, et *al*., 2013: 1407-1412).

#### *2.3.1.1 International*

Adepoju, Akanni and Falusi (2012:38) defined child mortality as the likelihood for a child to die between his/her first and fifth birthday. This study done in rural Nigeria stated that the number of deaths of children under five globally have declined from more than 12 million in 1990 to 7.6 million in 2010, with the highest rate still in Sub-Saharan Africa, where 1 child dies for every 8 children before the age of 5 years.

According to Rudan, Nair, Marusic and Campbell (2013:1) the Global Action Plan for Diarrhoea Global Action Plan (DGAP) and Pneumonia (GAPP) groups stated that childhood diarrhoea and pneumonia are the leading priorities in global health today. By scaling up current cost-effective interventions 95% of diarrhoea and 67% of pneumonia deaths in children under five by the year 2025 could be prevented.

Although child health is high on the priority-list on a national and state level in India, Stanly Sathiyasekaran and Palani (2009:1) claimed that every one out of four children under five, died from diarrhoea.

In Nepal with a population of almost 26.5 million people, the under-five mortality and infant mortality rates are 54 and 46 deaths per live births respectively. Diarrhoea mainly contributes to the burden of disease in the low- and middle-income nations, accounting for one-tenth of all deaths globally (Budhathoki, Bhattachan, Yadav, Upadhyaya & Pokharel 2016:1).

#### *2.3.1.2 National*

In South Africa, diarrhoea is one of the major causes of death among children younger than five years, accounting for 16 % of infant deaths and 20% of all child deaths in 1995 (Saha 2012:304).

Cooke and Cotton (2013:84) stated that the Medical Research Council, Burden of Disease Report specifies that diarrhoea is responsible for more than 10 000 deaths per year in South Africa with an increase in mortality rate between 1990 and 2008, with no improvement towards achieving MDG 4 by 2015.

Acute diarrhoea is the 3rd of the five main causes of death in hospitals in South Africa according to McKerrow and Mulandzi (2007:63, 65), with the most deaths in Gauteng and KwaZulu-Natal. Smith and McGladdery (2007:30) reported that Witbank Regional Hospital in Mpumalanga, South Africa reported a lower mortality

rate of 122 for every 1 000 admissions of diarrhoea (12.2%) from January to June 2005.

The previous Millennium Goals of the Western Cape Government: Health, Annual Performance Plan (APP), (2013/2014:4) states in goal number 4, that child mortality needs to reduce by two-thirds between 1990 and 2015 in children under five years of age. A strategic overview in 2009 showed that diarrhoea is one of the five major causes of deaths in the Western Cape, and 16% of children under five are still dying of the disease (APP), (2013/2014:33).

According to Chola, Michalow, Tugendhaft and Hofman (2015:1) progress has been made in reducing diarrhoea in the last decade, but it still seems to be a challenge, because diarrhoea is one of the leading causes of morbidity and mortality in South African children, accounting for 20% of under- five deaths.

In the Monitoring and Evaluation report of the Department of Health, Western Cape, West Coast District (2013:32), it shows that the incidence of diarrhoea among children under five was a total of 143 in Matzikama Sub-District in the third quarter of 2011-2012. The target was 69.0 per 1 000.

### 2.3.2 Knowledge of mothers and caregivers

In a study done by Osonwa, Eko and Ema (2016:31), 95.5% of respondents claimed that they have heard about diarrhoea, while 4.5% said that they have not heard of diarrhoea before. The sources where they received information from were:

health workers 45.7%, television/radio 21.2%, books/newspaper/magazine 4.8% and poster/handbills 4.3%. This study also reported that 10.5% had no knowledge of the causes of diarrhoea and 10.4% had no knowledge of any signs and symptoms of dehydration. The signs and symptoms identified for this study were sunken eyes 35.1%, dry tongue 21.8%, dry lips/tongue 15.2%, body weakness 10.4% and irritability 7.6%. Furthermore, about 62% of mothers declared that they have heard of ORT/ORS/SSS, 38% had no knowledge of ORS/SSS composition and only 17.5% could give an acceptable description of how to prepare ORS/SSS.

#### *2.3.2.1 Definition and causes of diarrhoea*

A review of "Home Management of Childhood Diarrhoea" in Nigeria by Adimora, Ikefuna and Ilechukwu (2011:237-241) about mothers who had children with diarrhoea reported that 71% defined diarrhoea correctly, 55.2% identified the causes of diarrhoea; but only 39.4% could correctly manage diarrhoea at home; 76% knew about oral rehydration salt and 27.6% could correctly prepare SSS (sugar-salt solution).

Mohammed and Tamiru (2014:3) reported that only 32.4% of mothers had a broad knowledge about the cause of diarrhoea and the ways of transmission.

From 430 mothers in Kashan Iran, 8% had a good knowledge of the diagnoses and treatment of diarrhoea, 46.5% had medium and 24.7% had low knowledge in diarrhoea. The study also revealed that only 38% of mothers in Indonesia identified two or more signs of dehydration, and out of three-fourths of women knowing about

ORS, only one-fourth used it to treat diarrhoea in children (Ghasemi, Talebian, Alavi & Mousavi 2013:161).

#### *2.3.2.2 Danger signs*

A study by Othero, Orago, Groenewegen, Kaseje and Otengah (2008:145) stated that 76.4% of mothers and caregivers were not able to mention any danger sign of diarrhoea, while only 3.1% of mothers knew all the danger signs. Knowledge of danger signs is vital for early referral of very sick children.

In their findings Shah, Ahmad, Khalique, Afzal, Ansari and Khan (2012:139) reported that 80% of mothers and caregivers in India knew at least one danger sign of diarrhoea; 85% knew about watery stools and 54% knew about repeated vomiting. On the knowledge about ORS, 46(5%) knew about ORS, 27(8%) knew the correct method of preparation. Only a few mothers knew how to give the ORS correctly.

#### *2.3.2.3 Knowledge about ORS*

Oral rehydration therapy (ORT) corners at health facilities serve as points to treat diarrhoea in children who are dehydrated. The Division of Child and Adolescent Health, Nairobi, Kenya (2013:5) describes ORT corners as a service point to address the health of a sick child with diarrhoea by ensuring the availability of equipment to demonstrate ORS mixing and administering ORS. By using ORT corners, parent's knowledge on preparing salt- sugar solution (SSS) was more than double those who did not use ORT corners, 74% and 30% respectively.

Furthermore, the knowledge of danger signs was higher among ORT corner users than among non-users as reported by Charyeva, Cannon, Oguntunde, Garba & Sambisa (2015:8).

Mukhtar, Izham and Pathiyi (2011:477) revealed that mothers' knowledge about the usage of ORS for diarrhoea was poor; none of them were able to mention the four steps of the correct preparation of ORS, and many gave the wrong volume of ORS to their children during diarrhoea in the Morang district of Nepal. This study also showed that a mother with higher education has better knowledge about preventing diarrhoea.

In a study done by Pahwa, Kumar and Toteja (2010:557- 558) in India, 63% of the mothers who were aware of ORS, only 27% used it in cases of childhood diarrhoea. In slum areas of Delhi in India, 94% of women knew about ORS but their usage was just 39%. Only 8% of these mothers knew the correct method of preparing the sugar-salt solution at home for a rehydration baseline.

Furthermore, a study done in Nigeria Teaching Hospital by Uchendu, Emodi and Ikefuna (2011:41-47) among caregivers with children under five years complaining of watery stools, reported that 30% believed ORS could stop diarrhoea. Twenty percent of caregivers on the other hand did not know that it was a replacement for body fluids. A total of 57.9% of caregivers prepared and administered the ORS and SSS incorrectly.

According to Jammalamadugu, Mosime, Masupe and Habte (2013:3) 98% of the participants reported possession of information regarding ORS, 74.2% had knowledge regarding the preparation of ORS and the source of information was mostly from the Child Welfare Clinic (88,8%). Other sources included the hospital (3.8%), friends (4.7%), radio (4.1%), television (3.1%), Clinic card (1.8%) and school (1%).

#### *2.3.2.4 Beliefs and Tradition*

Higher rates of diarrhoea prevalence were present in children whose primary caretaker believed that diarrhoea cannot be prevented in an assessment done in rural Burundi (Diouf, Tabatabai, Rudolph & Marx, 2014:5).

Many of the carers in Kenya stated that they wished they had more access to information in their community about childhood illnesses, home treatment, when to seek help and the cost of treatment. Some of them gained their knowledge from Allah or used their instinct as a mother (Juliet, Bedford & Sharkey, 2014:8).

Mothers in Nepal, as stated by Budhathoki *et* al. (2016:6) seem to have their personal beliefs about the nature of diarrhoea, severity, and sort of home management and believe that it is part of the childhood experience caused by evil spirits.

According to Budhathoki *et al.* (2016:5) mothers in Nepal believe that the causes of diarrhoea is supernatural and the traditional healing method like the ingestion of local bananas is among the cultural beliefs and practices of the mothers.

A study done by Diouf *et al*. (2014:3) established that most caretakers (51.7%;) were between 20 and 29 years old and had one to two children under five years of age (90.7%). This study also showed that diarrhoea was associated with factors such as the mother's age being younger than 25 years and the belief that diarrhoea could not be prevented.

#### *2.3.2.5 Treatment of diarrhoea*

However, Haroun, Mahfouz, Mukhtar and Salah (2010:141-146) conducted a random sampling study in Central Sudan on mothers according to different age groups. The study assessed the effect of health education on mothers and how this would improve the home care of children under five with diarrhoea, as well as their level of education. Only 15% of the mothers knew the three rules of managing diarrhoea at home, namely:

- increase in fluids;
- on-going feeding;
- getting medical care.

After intervention, from 35% in the beginning, it improved to n=118(95%).

Among the 672 parents in Doula, Cameroon, 418 knew the definition of diarrhoea, 660 identified at least one danger sign, 90 claimed to know about SSS but only 4 knew its composition. This study also published that 244 parents thought that ORS was intended to prevent or treat dehydration, 184 believed that it could stop diarrhoea, 36 thought it provided energy, 17 assumed that it killed germs and 201 had no idea of the role of ORS. Out of these parents, 258 reported that the information on ORS came mostly from the hospital (84/17.7%), from relatives (73/15.4%), from pharmacies (48/10.1%), from the media and (12/ 2.5%) from the school (Essomba, Koum, Adiogo & Coppieters, 2015: 62).

The only study done in the West Coast district in the Western Cape, South Africa by Stellenberg, Van Zyl and Eygelaar (2015:1), indicated that out of 270 community care workers only (25/10%) had a score higher than 70% on the knowledge-based items of the questionnaire on child health.

### 2.3.3 Education level of mothers and caregivers

Yilgwan and Okolo (2012:217-221) found in their study done at Jos University Teaching Hospital, Nigeria that there was an important relationship between low maternal education and diarrhoeal morbidity.

Educated mothers are more likely to be able to read and understand health education, media messages and other communications better than the less-educated ones, identified by Webair and Bin-Gouth (2013:1135). Mothers and

caretakers with secondary school education were six times more likely to seek medical care than the non-educated ones according to this study.

Ghasemi, Talebian, Alavi and Mousavi (2013:160) found that 28.8%, of mothers had good knowledge about diarrhoea, 46.5% had medium knowledge, while 24.7% had low knowledge. A relationship was found between the age of the mother, the father's education level, the number of their children, the occupation of mothers, as well as their source of knowledge. Women who received their knowledge from the media and through reading on their own had better knowledge than those who got information from their doctors. The women of husbands with higher education had better knowledge of diarrhoea.

Out of 161 mothers who were interviewed, Mwambete and Joseph (2010:3, 5, 8) reported that 20.5% of the mothers were illiterate. Diarrhoea was treated at home by one third (61.5%) of mothers, while 1.2% went to the nearest health facility and 43.5% of the mothers in the community depended on traditional medicines to treat diarrhoea. This study was done in Temeke Municipality in Tanzania and concluded that the mothers' knowledge about diarrhoea was poor if their level of education was low.

Stanly, Sathiyasekan and Palani (2009:3) found that among mothers who were illiterate the use of ORS was 43.2%, while the use of ORS among literate mothers was 75.6%.

A study done by Adepoju, Akanni, and Falusi (2013:40) revealed that 58% of mothers in rural Nigeria did not have formal education because formal education is not a requirement for the way of life in the rural areas. This study determined that an increase in the mother's education levels and improved services in health care are important in reducing child mortality in Ethiopia.

The mothers with secondary or higher education have better knowledge on the prevention of diarrhoea in comparison with those with less schooling (Budhathoki et al., 2016:5).

In Dhaka, Bangladesh a cross-sectional study identified that the prevalence of diarrhoea is lower among the children of higher educated mothers than among the children of mothers with primary or no education (Saha, 2012:306).

Siziya, Muula and Rudatsikira (2013:379) found that some of the mothers had an informal education or a primary level education, while most of them (72%) were uneducated as found in a study done in Morang. The researchers further found that 58.8% of mothers of children who had diarrhoea in Sudan had no formal education. Another study in Dhaka, Bangladesh revealed that 54.13% of the mothers had not attained any form of formal education, 35.78% had passed primary, 8.25% had passed secondary education and only 1.84% obtained tertiary training (Saha 2012:309).

Substantiated further Mohammed and Tamiru (2014:3) showed that 62.2% of mothers in Arba, Southern Ethiopia, did not attend formal education, and that their children were 89% more likely to develop diarrhoea compared to the children of mothers who attended formal education. Similarly, Mihrete, Alemie and Teferra (2014:4) found that children of mothers with no education were more likely to have diarrhoea when compared to children of mothers who had primary or higher education in Benishangul Gumuz Regional State in North West Ethiopia.

### 2.3.4 Socio-demographic factors

Findings by Saha (2012:305) show that exposure to diarrhoeal diseases in developing countries are determined by factors such as age of children, quality of water, housing conditions, level of education, economic status of households and place of residence.

#### *2.3.4.1 Residential and environmental factors*

Osumanu (2007:59-68) reported that children from indigenous residential areas in Ghana had eight times more diarrhoea than children from the high class residential areas. Risk factors in household environments identified were: shared toilets; stored water in a pot; not washing hands before preparing food or after visiting the toilet; flies in cooking area and dependent on water from a borehole. More than one-third of households (33.7%) in Arba Minch District in Southern Ethiopia used drinking water from unprotected sources, and more than two-thirds (66.9%) had a family size of more than five people.

According to Stanly *et al*. (2009:3), 58.2% of the houses where children under five had diarrhoea stayed in overcrowded conditions. Only 18.2% of the participants' personal hygiene was satisfactory.

A study done in rural Nigeria showed that 64.6% of the mothers were poor, 19.7% were middle class and 15.7% were rich. In this study 32% of the participants were unemployed, 24.4% were farmers, while 29.6% were involved in trading as their primary occupation. Out of these respondents, three-quarters did not have access to electricity, 53.1% did not have toilet facilities and 76.6% did not have access to safe drinking water (Adepoju *et al*., 2012:40-41). This study related the increased poverty level with an increased risk of illnesses and other causes of child health mortality (Adepoju *et al*., 2012:43).

Budhathoki *et al.* (2016: 1) declared that more than one third (38%) of citizens in Nepal do not have access to toilet facilities and around 18% of the people do not have access to safe drinking water. This study also reported that 25% of the people of Nepal live below the poverty line, therefore the poorer households delay in healthcare seeking, based on the projected cost. Consequently, children from wealthier families have less diarrhoea than the poorer children.

A study by Mengistie, Berhane and Worku (2013:452) also shows that diarrhoea was significantly associated with the presence of two or more children under five in the family.

This study also showed that where the number of children under five was fewer than three, the risk of diarrhoea decreased by 42% compared to households who had more than three under-five children (Mihrete, Alemie & Teferra 2014:5).

#### *2.3.4.2 Employment*

Osonwa, Eko and Ema (2016:31) stated that 25.5% of respondents in Odukpani, Nigeria were engaged in farming, 22% in trading, and 21% in public service, 18% were full-time housewives and n=8.5% were unemployed. This study indicated that the low socio-economic status influenced the treatment of diarrhoea.

Muktar *et al*. (2011:476) also determined that the main source of household income was through husbands working in factories or as laborers in the field in Morang, Nepal. The socio-demographic factors such as mothers' occupation and the husbands' employment status are linked with mothers' knowledge about diarrhoea and its management. Although mothers were aware of diarrhoea and its home management, the level of awareness was insufficient.

Essomba *et al*. (2015:61) in Douala, Cameroon indicated that n=340(50.6%) parents had secondary education, 42.7% were non-executive employees, 31.1% were housewives and unemployed and 17.2% were students. Their profession did not have a significant influence on the use of ORT (p=0.1).

#### *2.3.4.3 Safe water supply*

The lack of access to water and sanitation facilities in the rural areas were more common than in the urban areas in Uganda and Egypt, therefore the prevalence of diarrhoea was higher among rural children. Chiller, Mendoza, Lopez, Alvarez, Hoekstra, Keswick and Luby (2006:33) demonstrated that in-house using of a flocculant- disinfectant to treat contaminated drinking water reduced diarrhoea successfully in children under one year in Guatemalan.

Similar to Chiller *et al*., (2006), Rose, Roy, Abraham, Holmgren, George, Balraj, Abraham, Muliyil, Joseph and Kang (2006:140) proved that the risk of getting severe diarrhoea is decreased by 50% when the drinking water is disinfected by using solar disinfection in a study done in Southern India.

Godana and Mengistie (2013:7) showed in a study done in the Derashe District, Southern Ethiopia that the probabilities of developing diarrhoea was 2.25 times higher among children whose families did not treat drinking water, compared with children whose families treated water for drinking The study also indicated that the chances of developing diarrhoea was 2.43 times higher between children of families who had no toilets.

Smith and McGladdery (2007:39) stated that in South-Africa 73% of the rural population had access to improved water sources in 2002 and in 2005. This study also indicated that in KwaZulu-Natal 79.4% of households had access to piped water. Children in Benishangul, Gumuz in North West Ethiopia with no improved

water sources were twice more likely to have diarrhoea than children with an improved water source at home.

### 2.3.5 Seeking Medical Care

Howidi, Kaabi, Khoury, Brandtmüller, Nagy, Richer, Haddadin and Migdadyl (2012:12-74) completed a cross-sectional survey on mothers whose children had gastro-enteritis in the United Arab Emirates. In this study 85-91% parents sought medical care and 80% of parents used medication at home of which ORS was the most used (69%). These percentages in the seeking medical care and the use of medication at home were practically the same. Cost of treatment in hospital was 4 to 5 times higher than home treatment and parents missed work due to hospitalization of their children.

#### *2.3.5.1 Health facilities*

According to Saha (2012:311) 93.6% of mothers sought treatment for diarrhoea at a professional sector of health care, while 58.7% went to the pharmacist or drug dealers for medicine. Mothers did not seek treatment for diarrhoea at a traditional healing specialist, but sought curative treatment, legally sanctioned modern medicine from doctors and hospitals.

Godana and Mengistie (2013:2) found that diarrhoea is responsible for 25% to 75% of all childhood diseases, with around 14% of outpatient visits and 16% hospital admissions in Ethiopia.

Essombia *et al*. (2015:61) found that most parents (51.8%) of children with diarrhoea seek hospital attention first, 20.1% had given metronidazole as an antibiotic and 8.3% had given their children mebendazole which is a deworming tablet. The Community-based integrated management of childhood illness (CB-IMCI) trained health volunteers to identify danger signs which commanded earlier access of children to health care, to prevent morbidities and mortalities due to diarrhoea (Budhathoki *et al*., 2016:6).

The study by Webair and Gouth (2013:1134) recognized that 122 caretakers perceived the illnesses as severe, but only 19 of them took their children for medical care during the first day of illness.

According to Cooke and Cotton (2013: 85), 1382 children were admitted with diarrhoea during a 16-month period to the Tygerberg Children's Hospital in Cape Town, Western Cape. Prior to admission to the hospital 6 caregivers did not seek medical advice at primary level, 58 had one primary care visit and 50 were referred after 2 visits to a health care provider. Out of all the caregivers, 78.8% attended a free local clinic, while 12.7% went to a general practitioner and 1.4% sought advice at a pharmacy. Out of these 21 children 1 child had 1 previous admission for diarrhoea, 2 had 2 previous admissions and 7 had more than 2 admissions.

#### *2.3.5.2 Traditional healers*

In the rural African communities hospitals are not readily accessible; therefore dependence on indigenous herbal medicines as remedies for diarrhoea, as a

primary source of health care, is increasing in these communities. As a result the ratio of indigenous healers to the population in Sub Saharan Africa is approximately 1:500, while the ratio of medical doctors to the population is 1:40000 (Njume & Goduka, 2012:2).

#### *2.3.5.3 Private sector*

The majority of carers who seek treatment at health care facilities were turned away or sent to a private chemist to buy medication in Kenya (Juliet, Bedford & Sharkey, 2014:9).

### 2.3.6 Home-based treatment

Most of the mothers (45.3%) stated that they had given their children anti-diarrhoea medication, 18.7% home-made fluids, 14.9% sought medical help, 13.4% gave ORS and 7.7% gave herbal medicine in a rural community in Kenya (Othero *et al.,* 2008:145). Caregivers reported in a study that modern medicines are powerful and more effective in treating diarrhoea than ORS (Carter, Bryce, Perin & Newby, 2015:6). The diarrhoea management practices were based on the advice of health care workers, relatives, community workers as well as their own observations, treatment and traditional-held beliefs on causes and cures for diarrhoea (Carter, Bryce, Perin & Newby, 2015:6).

#### *2.3.6.1 Home remedies*

Njume and Goduka (2012:3, 5) found that in many rural communities in Africa extracts, decoctions or ashes of various plants are used as remedies for diarrhoea

and other diseases. More than 80% of people in rural Africa still rely on indigenous medicine as a primary source of health care.

Health seeking was not the first choice in treating diarrhoea; mothers and caretakers in South Africa used home remedies as the first action in the treatment of diarrhoea. The most common first response was to buy over-the-counter drugs. Children were taken for medical care only after home treatments and those of traditional healers failed (Webair & Bin-Gouth 2013: 1134).

#### *2.3.6.2 Spiritual beliefs*

Many carers in Kenya confirmed that they sought the services of a spiritual healer or pray to God, before seeking help at a health facility; some make use of herbal medicine to treat diarrhoea, as confirmed by Juliet, Bedford & Sharkey (2014:8).

According to Ansari, Palaian and Ibrahim (2009: 235) caregivers had different traditional beliefs about the home-based management of childhood diarrhoea, such as the reduction in breastfeeding; restriction of foods and fluids, the use of enemas and herbs, as well as the belief in magical power.

#### *2.3.6.3 No treatment*

The findings of the study in Arba, Southern Ethiopia showed that out of 180 mothers whose children had developed diarrhoea, 31% of them did not give anything at home to manage the diarrhoea (Mohammed & Tamiru, 2014:3).

#### *2.3.6.4 ORS*

In Douala, Cameroon some parents (33.5%) who treat their children initially at home with diarrhoea, preferred ORS as the first treatment and 16.2% used herbal remedies. About half of these parents with a single child had no experience in the management of diarrhoea, while those with more than one child had some sort of experience (Essomba *et al.,* 2015:61).

According to Jammalamadugu, Mosime, Masupe and Habte (2013:3) grandmothers as caretakers were a negative predictor of household availability of ORS, while caretakers who were knowledgeable about ORS preparation were more likely to have ORS available at home.

Osonwa *et al.* (2015:33,35) found that out of 69(34.5%) mothers whose children had diarrhoea in Odukpani, Nigeria, only 43.5% treated their children at home with ORS, 56.5% did not use ORS and 22.5% of these mothers treated their children with traditional medicine/herbs at home. It was also revealed that 20.3% of mothers only administered ORS/SSS after they had recognized signs of body weakness, 15.9% of them started to give ORS/SSS a day after diarrhoea had started, while 5.5% started treating immediately with ORS/SSS when the child passed a watery stool.

In a study done in Tygerberg Hospital in Western Cape, South Africa, most of the caregivers 78.9% whose children were admitted with diarrhoea, gave ORS, 67.9%

gave homemade ORS before seeking medical help and 12.5% mixed the ORS incorrectly (Cooke, Nel & Cotton, 2013:3).

## 2.4 CONCEPTUAL FRAMEWORK

For expressing a theory or a study framework, a map or model is used which graphically shows the interrelationship of the concepts and relational statements. The conceptual or framework map explains the concepts contributing to or partially causing the outcome. It summarizes and integrates what is known about a phenomenon and includes all the major concepts in a theory or study framework (Burns & Grove 2011:233). The Health Believe Model and the Social Learning Theory were applied to guide the study about managing diarrhoea successfully at home in children under five years of age.

### 2.4.1 Health Believe Model (HBM)

The HBM was one of the first theories developed to explain the process of change in relation to health behaviour. The HBM consists of three major components:

- individual perceptions about health
- modifying factors, like socio-demographic factors and educational status; and
- the likelihood of taking actions to change behaviours (Tarkang & Zotor, 2015:1).

Each component is based on the following concepts:

#### *2.4.1.1 Perceived Susceptibility*

It defines an individual's beliefs about the changes of contracting a health condition. Mothers and caregivers must believe that any child can become infected with diarrhoeal disease.

#### *2.4.1.2 Perceived Severity*

This concept refers to one's beliefs of how serious a condition and its consequences are. Diarrhoea is a serious condition which can cause death in children under five if knowledge is inadequate to treat the disease.

#### *2.4.1.3 Perceived Benefits*

It refers to an individual's beliefs in the efficacy of the advised action to reduce the risk or seriousness of impact. This belief gives a person confidence to take action because of the expected outcomes. Gaining knowledge and changing ideas that did not work, can contribute to managing diarrhoea successfully at home.

#### *2.4.1.4 Perceived Barriers*

Perceived barriers refer to a person's belief in the tangible and psychological costs of the advised behaviours. Only when people realize that they have the capacity to deal with these barriers will they be able to deal with these barriers. In this study barriers refer to the socio-demographic level, knowledge of diarrhoea and education level of the mothers of children with diarrhoea.

#### *2.4.1.5 Cues to Action*

Cues to action are personal, interpersonal or environmental events that motivate an individual to take action after believing that one has the capacity to do so. Being informed and aware of resources on the management of diarrhoea, mothers will be able to treat the disease successfully at home. Mothers will know when to seek medical help in cases where the child develops any danger sign of diarrhoea.

#### *2.4.1.6 Self-Efficacy*

This is one's ability to successfully take action and believe in one's own ability to respond in difficult situations and deal with any related obstacles or setbacks. Through training and guidance mothers will have the ability to treat diarrhoea with confidence at home (Tarkang & Zotor 2015:5).

### 2.4.2 Social Learning Theory

The social learning theory of Albert Bandura (1977) states that behaviour is learned from the environment through observational learning, and it adopts the behaviour of another person. Furthermore, the reinforcement of the behaviour can be positive or negative, and it usually leads to a change in a person's behaviour (McLeod 2011:1). Mothers and caregivers of children under five with diarrhoea have to change wrong practices in treating diarrhoea to get a successful outcome in managing the disease at home.

## 2.5 SUMMARY

In this chapter the literature review, gives a brief overview of the factors that influence the home-based management of diarrhoea at home. However, studies done in the Western Cape in South Africa are limited. The Health Believe Model and the Social Learning Theory give guidance to change health behaviour in a positive direction. The research methodology applicable in this study will be described in chapter three.

## 2.6 CONCLUSION

The literature revealed what is internationally and nationally known about: child mortality and morbidity; knowledge of mothers and caregivers; educational level; socio-demographic factors; seeking medical care; as well as the home-based management to treat diarrhoea successfully at home. The conceptual framework based on the Health Believe Model and the Social Learning Theory were applied in this study.

# CHAPTER 3:
# RESEARCH METHODOLOGY

## 3.1 INTRODUCTION

The first two chapters gave an overview of the foundation, as well as the literature review for the study. This chapter describes all the steps of the research methodology applied to investigate the factors influencing the home-based management of diarrhoea in children under five years in the rural setting.

## 3.2 STUDY SETTING

The study setting is defined as the location in which the study is conducted and can be: natural, partially controlled and highly controlled (Burns & Grove 2011:40). In this descriptive study a natural setting was used.

The data was collected from the two main clinics: Vredendal-North Clinic, as well as Vredendal-Central Clinic in the Matzikama Sub-District in the West Coast District in the Western Cape Province.

## 3.3 RESEARCH DESIGN

Research design is the blueprint for conducting a study that guides the planning and implementation of the study to achieve accurate results (Grove, Burns & Gray, 2013: 195). This study was based on a quantitative descriptive research design. As

stated by Burns and Grove (2011: 257), a descriptive design includes identifying phenomenon variables within the phenomenon, conceptual and operational definitions of the variables and the describing of the variables.

### 3.3.1 Quantitative Research

Quantitative research is defined as a formal, objective, systematic process in which numerical data are used to obtain information globally (Burns & Grove 2011:20).

For the purpose of this study, quantitative research incorporates the study of:

- research questions that describe the phenomena;
- test relationships; and
- measuring differences (LoBiondo-Wood and Haber, 2010:8).

### 3.3.2 Descriptive design

A descriptive study design was applied to gain more information about the factors influencing the home-based management of diarrhoea in children under five years in the rural setting in the Matzikama Sub district, and to provide a picture of situations as they naturally happen (Grove, Burns & Gray, 2013:215).

## 3.4 POPULATION AND SAMPLING

Burns and Grove (2011: 290) define a population as a specific group of individuals or elements who are the focus of the research. The total population (N=1950) for this study included all the mothers and caregivers of children under five at the two main clinics in Vredendal in the Matzikama Sub-District from 2009 to 2013.

Vredendal is the largest town in the Matzikama sub district where two main clinics serve the entire town with the highest amount of headcounts as shown in Figure 3.1 (Sinjani-statistics, Vredendal Hospital 2017)

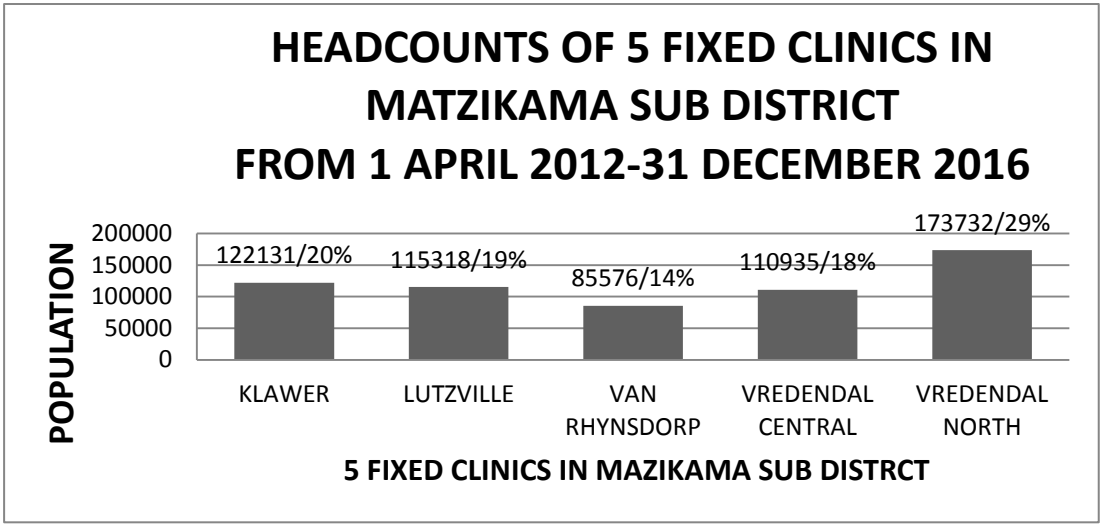


**Figure 3.1: Headcounts of clinics in Matzikama Sub District**

Sampling is described as selecting a group of people, events, behaviours or other elements to conduct a study and the sample defines the selected group (Burns & Grove, 2011:290). According to De Vos et al. (2011:225), 10% of the total population is a representative sample size.

Thus, for the purpose of this study the sample size consisted of a total of 195 subjects, which include 10% of the total number of 1150 of the Vredendal-North Clinic (n=115) and 799 subjects of the Vredendal-Central Clinic (n=80).

A convenient sampling method was applied, by selecting mothers who met the criteria and voluntarily agreed to participate in the study at the respective clinics over a period of 10 working days. The selection was done by initially talking to all the people already sitting in the waiting rooms. Many of them voluntarily indicated that they would participate in the study. The voluntary participants were taken into a private consultation room at the clinics where the purpose of the study was explained again. As new people came into the clinic, they were selected one-by-one throughout the day. In convenience sampling, subjects are included in a study because they happen to be in the right place at the right time (Groves, Burns & Gray, 2013:363). Table 3.1 shows the setting of the study population.

**Table 3.1: Study population**

| Vredendal Clinics | Mothers and Caretakers | Sample |
|---|---|---|
| Vredendal-Central | n=799 | n=80 (10%) |
| Vredendal-North | n=1151 | n=115 (10%) |
| Total | N=1950 | n=195 |

### 3.4.1 Inclusion criteria

According to Burns and Grove (2011:291) inclusion sampling criteria are described as the characteristics that the element must own to be part of the target population.

The target population was all the mothers and caregivers 18 years and older of children under five years. All mothers and caregivers from other clinics, who attended the identified clinics for this study, were included in the research. The target population included mothers and caregivers whose children under five years had a history of the treatment of diarrhoea of the child in the previous year.

### 3.4.2 Exclusion criteria

Exclusion sampling criteria are characteristics that can cause a person or element to be excluded from the target population (Grove *et al*., 2013:353). Mothers and caretakers younger than 18 years or mentally incapacitated caretakers were excluded in the target population, as well as children 5 years and older.

## 3.5 INSTRUMENTATION

According to Grove *et al*. (2013: 44) instrumentation is defined as the application of specific rules to develop a measurement device to measure a specific variable in a study. A questionnaire as instrument was used in this study.

Burns and Grove (2011: 353) define a questionnaire as a printed self-report form to gather information through written or verbal responses of the subjects. The questionnaire was translated into Afrikaans and IsiXhosa by experts in the respective language fields. The questionnaire was divided into the following sections:

### 3.5.1 Section A: Demographic variables

The demographic data of the participant was collected from questions (1 to 5) regarding the age, gender, race, highest school grade passed and marital status.

### 3.5.2 Section B: Socio-economic variables

Questions (6 to 12) were based on the socio-economic determining factors influencing the home-management of diarrhoea of the participants including: the number of people in the house, the number of children under the age of five living in the house, the relation to the child, how many rooms are in the house, if there is access to safe and clean drinking water, if there is access to electricity and what the source of the monthly income is.

### 3.5.3 Section C: Knowledge of diarrhoea

These questions (13 to 17) were based on the participant‘s understanding of the term “diarrhoea”; knowledge on where to access a source for more information about diarrhoea; to identify the recipe of ORS; danger signs of diarrhoea and the signs of dehydration.

### 3.5.4 Section D: Participants’ previous involvement with the management of diarrhoea

The questions were based on the history of the treatment of diarrhoea of the child in the previous year (questions 18-24).These questions included the age of the child that was diagnosed with diarrhoea; if the child was treated at home or not; if the treatment given at home was successful or not, and if not, did the participant

seek medical help and also where; what the signs were that made the participant want to get medical help for the child.

## 3.6 PILOT STUDY

De Vos *et al*. (2011:73) define a pilot study as a small-scale implementation of the planned main investigation. The purpose of a pilot study is to improve the success and effectiveness of the investigation, space must be given on the questionnaire and during the interviews. A pilot study is valuable for refining the wording, ordering and layout of the questionnaire. (De Vos *et.al*. 2011:241-242).

A convenient sample of n=20 (10%) participants of the actual study were drawn from the Klawer Clinic in the Matzikama Sub-District where the pilot study was conducted. Klawer clinic was chosen for the pilot study because it had the second highest headcounts in Matzikama sub district as shown in Figure 3.1(Sinjani-statistics, Vredendal Hospital, 2017).The questionnaire tested during the pilot study was found to have no ambiguity and was easily understood by the participants. Thus, no changes or adjustments were made to the questionnaire.

## 3.7 RELIABILITY AND VALIDITY

### 3.7.1 Reliability

Groves et al. (2013: 289) refer to the reliability of an instrument as the consistency of the measures obtained of an attribute, item or situation in a study. Reliability

testing examines the amount of measurement error in the instrument being used in the study.

To test for reliability a pilot study was conducted in Klawer Clinic in Matzikama Sub-District to clarify if participants were able to answer the questions on the questionnaire. To ensure reliable data the researcher collected and captured the data personally. Furthermore reliability was ensured by working with a statistician and experts in primary health care. The statistician suggested that no further tests be done, such as the Cronbach alpha coefficient test due to the simplicity of the questionnaire which was applicable to the target population.

### 3.7.2 Validity

Validity is the degree to which an instrument measures the attributes of a concept accurately. It is a single broad method of measurement evaluation; divided into construct validity, which includes content and predictive validity (LoBiondo- Wood & Haber, 2010: 288).

***Face validity*** verifies that the instrument looks like it was valid or gives the appearance of measuring the construct it is supposed to measure (Grove *et al*., 2013:394). The appearance of the questionnaire and the questions were written in a more simplified manner so that it was easily understood by the mothers and caregivers. The statistician, study supervisors and experts in primary health care checked and verified the questionnaire to ensure face validity.

***Construct validity***. LoBiondo-Wood and Haber (2010:290) defines construct validity as the extent to which a test measures a theoretical construct, attribute or trait. Construct validity will be assured whether all the components based on the factors influencing the home-based management of diarrhoea are included in the questionnaire.

***Content-validity*** examines the extent to which the measurement includes the elements relevant to the construct being measured (Burns & Grove, 2011: 335). The content of the questionnaire and the design of the questions were evaluated by the statistician, professional nurse experts and experts in primary health care.

The validity of the study was supported through consultation with experts in statistics, research methodology, primary health care and study supervisors throughout the study. The literature review, as well as the conceptual framework supported the validity of the study. A pilot test was done to validate the methodology including the data collection instrument.

## 3.8 DATA COLLECTION PROCESS

As indicated by Grove *et al*. *(*2013:45), data collection is a systematic gathering of information related to the research purpose of a study, and data collected in quantitative studies are usually numerical.

Two weeks before the process of data collection the researcher informed the operational manager of the clinics involved in the study that data would be

collected on the specific dates after consent was granted from the Department of Health.

All mothers and caregivers of children under five who visited the clinic on the days the data was collected, could voluntarily take part in the study. The researcher introduced herself and explained to the participants in a group initially and then one- by-one as they came into the clinic, what the study was about. The participants first had to complete the consent form before they completed the questionnaires.

The researcher explained the purpose of the study, as well as the expectations and responsibilities of both the participants and the researcher. Before the questionnaires were completed, the participants first had to complete the consent form.

The researcher personally collected the data with the aid of a questionnaire with the participants at each of the identified clinics in Vredendal in the Matzikama Sub district. A structured interview was conducted with the participants with limited literacy skills to assist with the completion of the questionnaires. All mothers and caregivers with children under 5 years and who voluntary agreed to participate in the study and who met the criteria were interviewed.

The duration to complete the questionnaire was on average 15 to 20 minutes. However, it took participants with limited literacy skills up to 30 minutes longer to complete the questionnaire.

The researcher conducted individual interviews. The questions were posed to the participant and the appropriate response was ticked off by the participant. The majority of participants completed the questionnaire without support. The questions were posed in Afrikaans, English and Xhosa. A Xhosa-speaking counsellor assisted the Xhosa-speaking people in completing the questionnaires in the presence of the researcher. The counsellor was part of the informed consent, signing as a witness.

The data was collected over a period of six working days, starting on 05 June 2015 until 12 June 2015. The collecting of data started at Vredendal-North Clinic within the first three days and was continued the following three days at Vredendal Central Clinic. A total of 195 participants completed the questionnaires.

## 3.9 DATA PREPARATION

The raw data was captured on an Excel spreadsheet and the questionnaires were numbered from 1 to 195. The researcher pre-coded each variable before entering the data onto the spreadsheet. The spreadsheet consists of columns which contain the question or variable replies (De Vos *et al*., 2011:254). Where data was missing, blank spaces were left open. A total of N=195 completed and uncompleted questionnaires were included in the data analysis.

The captured data was sent to a qualified statistician at the University of Stellenbosch for analysis.

## 3.10 DATA ANALYSIS

With the support of a qualified statistician at Stellenbosch University data was analysed using the STATA 14 computer software program. Descriptive statistical analysis was applied, cross tabulation between the biographical data and the successful treatment of diarrhoea at home was done applying the Fisher's exact probability test.

### 3.10.1 Descriptive data analysis

De Vos *et al*. (2011:251) define descriptive methods as a technique to report the distributions of a sample or population across a wide range of variables. In descriptive statistics the numerical data assist in the organising, summarising and interpreting of the sample data (De Vos *et al*., 2011:251).

**Categorical data** of nominal variables do not fall into any rankable order, therefore no arithmetical calculations like addition, subtraction, multiplication or division can be performed (De Vos *et al*., 2011:249). Consequently, the statistician could not calculate the **mean** and **median** on the categorical data.

The data were presented with the use of frequency tables and bar graphs.

### 3.10.2 Cross tabulation

Cross tabulation is a method for demonstrating the joint-frequency distributions for two variables. This is the best technique to observe the association between variables when at least one is nominal (De Vos *et al*., 2011:268). The cross tabulation was applied to see if there were any associations between the successful and unsuccessful treatment of diarrhoea at home, and the other variables.

### 3.10.3 Fisher's exact test

According to LoBiondo-Wood and Haber (2010:326) the Fisher's exact probability test is a nonparametric statistical test and is used to compare frequencies when samples are small and less than 6 in each cell.

The statistician applied the Fisher's exact test, equivalent to the Chi-square test, as there were quite a few blank spaces. More than 11 elements did not meet the requirements to be able to apply the normal Chi-square test. Therefore, the sample size of n=117 participants met the requirements for the Fisher's exact test.

### 3.10.4 Statistical significance

Statistically significant data analysis has been developed to ascertain whether the results of the data are meaningful and not just the result of change. In practice the tests are performed on the 0, 05 or the 0, 01 level of significance (De Vos *et al*., 2011:274-275). Thus, for the purpose of this study by convention in health care the 95% confidence-interval level is applied, 0.05 level of significance.

## 3.11 RESPONSE RATE TO QUESTIONNAIRES

Grove *et al*. (2013) state that a response rate of less than 50% is seriously questioned to measure the representativeness of a sample. The returned questionnaires were N=195 with a response rate of 100%, although all of the questions were not completed.

## 3.12 SUMMARY

The research methodology which includes the study setting, research design, population and sampling, instrumentation, pilot test, reliability and validity, data collection and data analysis were discussed.

In chapter four the interpretation of the results of the study will be discussed.

# CHAPTER 4:
# RESULTS

## 4.1 INTRODUCTION

This chapter summarises the data analysis and provides the interpretation of the study. Grove *et al*. (2013:46) define data analysis as the process that reduces, organizes and gives meaning to the data. The quantitative data analysis applied in this study includes descriptive and statistical techniques (Grove *et al*., 2013:46).

The purpose of the data analysis was to determine the factors influencing the successful or unsuccessful home-based treatment of diarrhoea in children under five in the rural setting. The statistical tests as described in chapter three were done to analyse the data.

## 4.2 SECTION A: DEMOGRAPHIC DATA

In this section the demographic profiles of the participants were illustrated. The data include their age, gender, race, highest school grade and marital status.

### 4.2.1 Question 1: Your Age

The majority of participants n=102 (52.3%) were between the ages of 26 and 40, while n=26 (13.3%) were in the ages between 41 and 65.

The Fisher's exact test identified no statistically significant difference between the age and the successful home-based management of diarrhoea at home in children under five (p=0.378). Participants n=89 who treated diarrhoea successfully at home, n=45 (50.6%) of participants, were between the **ages of 26 and 40**.

**Table 4.1: Age**

| Age | Frequency (f) | Percentage (%) |
|---|---|---|
| 18-25 | 67 | 34.4 |
| 26-40 | 102 | 52.3 |
| 41-65 | 26 | 13.3 |
| **Total** | **n=195** | **100** |

### 4.2.2 Question 2: Your Gender

As shown in table 4.2, most of the participants n=180 (92.3%) were female with only a few males n=15 (7.7%).

**Table 4.2: Gender**

| Gender | Frequency (f) | Percentage (%) |
|---|---|---|
| Male | 15 | 7.7 |
| Female | 180 | 92.3 |
| **Total** | **n=195** | **100** |

### 4.2.3 Question 3: Your Race

According to table 4.3, the majority of participants n=157 (80.5%) were Coloured, with only n=2 (1%) White participants who participated in the study. The Fisher's exact test identified no statistical significant difference between the race and the successful home-based management of diarrhoea at home (p=0.105).

Participants (n=117) who treated diarrhoea at home, were the **Coloured** participants n=72 (61.5%) who treated diarrhoea successfully.

**Table 4.3: Race**

| Race | Frequency (f) | Percentage (%) |
|---|---|---|
| Black | 36 | 18.5 |
| Coloured | 157 | 80.5 |
| White | 2 | 1 |
| **Total** | **n=195** | **100** |

### 4.2.4 Question 4: Highest school grade passed

The majority of mothers and caretakers n=140 (71.8%) had a scholastic education between grades 7-11, with a minority n=21 (10.8%) between grades 0-6 (Table 4.4). The participants (n=140) who **passed grade 7-11**, n=57 (40.7%) treated diarrhoea successfully at home.

**Table 4.4: Highest school grade passed**

| Grade | Frequency (f) | Percentage (%) |
|---|---|---|
| 0-6 | 21 | 10.8 |
| 7-11 | 140 | 71.8 |
| 12 | 34 | 17.4 |
| **Total** | **n=195** | **100** |

### 4.2.5 Question 5: Marital Status

According to figure 4.1, many participants were single n=98 (50.3%), while only n=43 (22.1%) were married.

Participants who were **single** parents who treated their children **at home** (n=62), n=44 (71%) treated diarrhoea successfully.

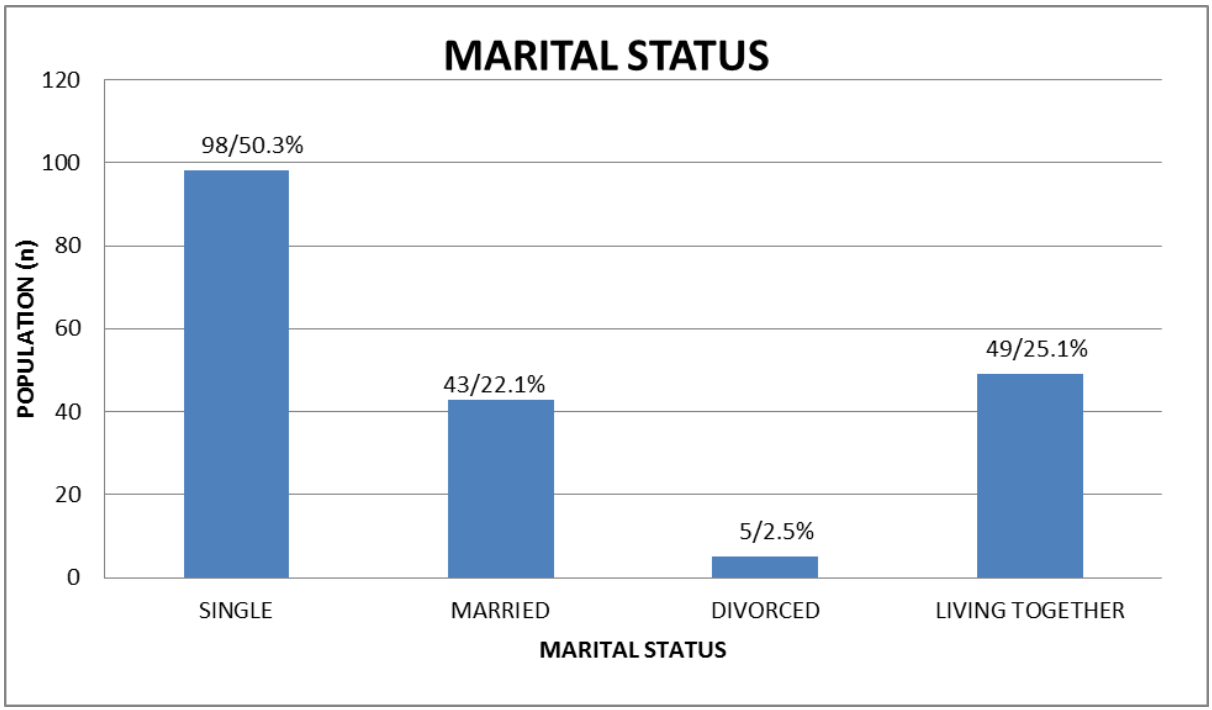


**Figure 4.1: Marital status**

## 4.3 SOCIO-ECONOMIC VARIABLES

In Section B the participants were requested to identify their socio-economic position with regard to:

- people living in the house
- children under five in the house
- relation to the child

- rooms in the house
- drinking water
- electricity
- financial income

### 4.3.1 Question 6: How many people live in the house?

As shown in table 4.5, the majority of participants n=108 (55.4%) were between 4-6 people living in a house, while n=6 (3.1%) were more than 10 in a house. Based on the number of people living in the house, 4-6, who treated diarrhoea **at home,** n=42 (64.6%) had a successful treatment outcome of a total of n=62 participants. The Fisher's exact test indicated that there is a significant difference between the number of people living in the house and the successful home-based management of diarrhoea (p=0.003). The results show that with an increase in the number of people living in a house the results of treating diarrhoea is more successful, than those fewer in the house.

**Table 4.5: Number of people living in the house**

| Number in house | Frequency (f) | Percentage (%) |
|---|---|---|
| 1-2 | 51 | 26.1 |
| 4-6 | 108 | 55.4 |
| 7-10 | 30 | 15.4 |
| >10 | 6 | 3.1 |
| **Total** | **n=195** | **100** |

### 4.3.2 Question 7: How many children under five live in the house?

Most of the participants n=122 (62.6%) had only one child under five in the house, while only n=1 (0.5%) had 5 children under five (Table 4.6).

No statistical significant difference was found between the number of children under five in the house and the successful home-based management of diarrhoea, according to the Fisher's exact test (p=0.352). The households with only **one child under five** had a successful treatment outcome of n=55 (76.4%) of a total of n=72 participants who treated diarrhoea **at home**.

**Table 4.6: Children under five in the house**

| Children under five | Frequency (f) | Percentage (%) |
|---|---|---|
| 1 | 122 | 62.6 |
| 2 | 54 | 27.7 |
| 3 | 14 | 7.2 |
| 4 | 4 | 2 |
| 5 | 1 | 0.5 |
| **Total** | **n=195** | **100** |

### 4.3.3 Question 8: What is your relation to the child?

The majority of participants were parents n=138 (70.8%) as illustrated in table 4.7. Most of the **parents** n=60 (73.2%) of n=82 treated their children with diarrhoea successfully **at home**.

**Table 4.7: Relationship to the child**

| Relation to child | Frequency (f) | Percentage (%) |
|---|---|---|
| Parent | 138 | 70.8 |
| Caregiver | 34 | 17.4 |
| Parent & caregiver | 4 | 2.1 |
| Caregiver & other | 8 | 4.1 |
| Parent & caregiver | 11 | 5.6 |
| **Total** | **n=195** | **100** |

### 4.3.4 Question 9: How many rooms are in your house?

As shown in table 4.8, the majority of participants n=73 (37.4%) had 2 rooms in their house and n=14 (7.2%) had 5 rooms in the house.

The Fisher's exact test showed no statistical significant difference between the number of rooms in the house and the successful home-based management of diarrhoea (p=0.087). Out of the mothers and caregivers with **2 rooms in the house n=43,** n=37 (86%) treated diarrhoea successfully **at home**.

**Table 4.8: Rooms in the house**

| Rooms in house | Frequency (f) | Percentage (%) |
|---|---|---|
| 1 | 58 | 29.7 |
| 2 | 73 | 37.4 |
| 3 | 35 | 18 |
| 4 | 15 | 7.7 |
| 5 | 14 | 7.2 |
| **Total** | **n=195** | **100** |

### 4.3.5 Question 10: Do you have clean, safe drinking water?

Only n=3 (1.5%) of the participants did not have clean, safe drinking water at home, while the majority n=192 (98.5%) had safe drinking water (Table 4.9).

No statistical significant difference was found between clean, safe drinking water and the successful home-based management of diarrhoea according to the Fisher's exact test (p=1.000).The majority of mothers and caregivers n=87 (97.8%) of a total of n=115 who had access to clean, safe drinking water treated diarrhoea successfully **at home**.

**Table 4.9: Safe drinking water**

| Safe drinking water | Frequency (f) | Percentage (%) |
|---|---|---|
| Yes | 192 | 98.5 |
| No | 3 | 1.5 |
| **Total** | **n=195** | **100** |

### 4.3.6 Question 11: Do you have electricity?

As shown in table 4.10, most of the participants n=181 (92.8%) had electricity at home, while the minority of the participants n=14 (7.2%) had no electricity in their homes.

The Fisher's exact test indicated no statistical significant difference between electricity and the successful home-based management of diarrhoea (p=1.000). Most of the participants n=80 (89.9%) of n=106 who have electricity treated diarrhoea successfully **at home**.

**Table 4.10: Electricity**

| Electricity | Frequency (f) | Percentage (%) |
|---|---|---|
| Yes | 181 | 92.8 |
| No | 14 | 7.2 |
| **Total** | **n=195** | **100** |

### 4.3.7 Question 12: What is your source of financial income per month?

According to table 4.11, most of the participants n=67 (34.3%) received a grant as a monthly income, while nearly equal, n=66 (33.8%) received a salary.

Having applied the Fisher's exact test, no statistical significant difference was found between the source of financial income and the successful home-based management of diarrhoea at home (p=0.467). Results further show that of the participants who received a **salary** n=45, n=36 (80%) treated diarrhoea successfully **at home**.

**Table 4.11: Income source**

| Income source | Frequency (f) | Percentage (%) |
|---|---|---|
| Grant | 67 | 34.3 |
| Salary | 66 | 33.8 |
| Pension | 3 | 1.6 |
| Other | 4 | 2.1 |
| Grant & salary | 39 | 20 |
| Grant, salary & pension | 2 | 1 |
| Salary & pension | 5 | 2.6 |
| Salary & other | 1 | 0.5 |
| Grant & pension | 8 | 4.1 |
| **Total** | **n=195** | **100** |

## 4.4 SECTION C: KNOWLEDGE

Section C of the questionnaire was generated to determine the participant's knowledge on diarrhoea based on:

- the term "diarrhoea",
- the information source on how to treat diarrhoea,
- recipe of the Oral Rehydration Solution (ORS),
- danger signs of diarrhoea,
- signs of dehydration.

### 4.4.1 Question 13: What do you understand under the term "diarrhoea"?

Most of the participants n=125 (64.1%) defined diarrhoea incorrectly, and only n=70 (35.9%) knew the correct definition as illustrated in table 4.12.

The Fisher's exact test identified no statistically significant difference between the definition of diarrhoea and the successful home-based management of diarrhoea (p=0.464). Based on the **correct definition of diarrhoea (n=70)**, n=37 (52.9%) treated diarrhoea successfully at home.

**Table 4.12: Definition of diarrhoea**

| Definition of diarrhoea | Frequency (f) | Percentage (%) |
|---|---|---|
| Two watery stools in 24h | 60 | 30.8 |
| Two soft stools in 12h | 41 | 21 |
| Three loose stools in 36h | 24 | 12.3 |
| Three to four watery stools in 24h | 70 | 35.9 |
| **Total** | **n=195** | **100** |

### 4.4.2 Question 14: Name the source where you can get information on how to treat diarrhoea

As indicated in table 4.13, most of the participants n=162 (83.1%) received their information from the clinic on how to treat diarrhoea and only n=7 (3.6%) received information from the hospital.

The Fisher's exact test indicated a statistically significant difference between the information source and the successful home-based management of diarrhoea (p=0.005). Participants (n=99) who treated diarrhoea **at home**, mostly those participants n=80 (80.8%) who received information from **the clinic,** treated diarrhoea successfully. The results show that participants, who received information at the clinic, had an increased successful treatment outcome, in comparison to those who received it from other resources.

**Table 4.13: Information source**

| Information source | Frequency (f) | Percentage (%) |
|---|---|---|
| Clinic | 162 | 83.1 |
| Hospital | 7 | 3.6 |
| Hospital & clinic | 3 | 1.5 |
| Other | 17 | 8.7 |
| Hospital, clinic & other | 6 | 3.1 |
| **Total** | **n=195** | **100** |

### 4.4.3 Question 15: Identify the recipe of the Oral Rehydration Solution (ORS)

Figure 4.2 indicates the participant's knowledge on the recipe of ORS. Slightly more than half of the participants n=110 (56.4%) knew the correct recipe of ORS. The correct answer is: 1 litre boiled water + 8 teaspoons sugar + ½ teaspoon salt.

No statistical significant difference was found between the knowledge of the recipe of ORS and the successful home-based management of diarrhoea, as indicated by the Fisher's exact test (p=0.509). Results further show that out of a total of n=66 who treated diarrhoea **at home,** n=51 (77.3%) of these participants who knew the **correct recipe of ORS treated diarrhoea successfully.**

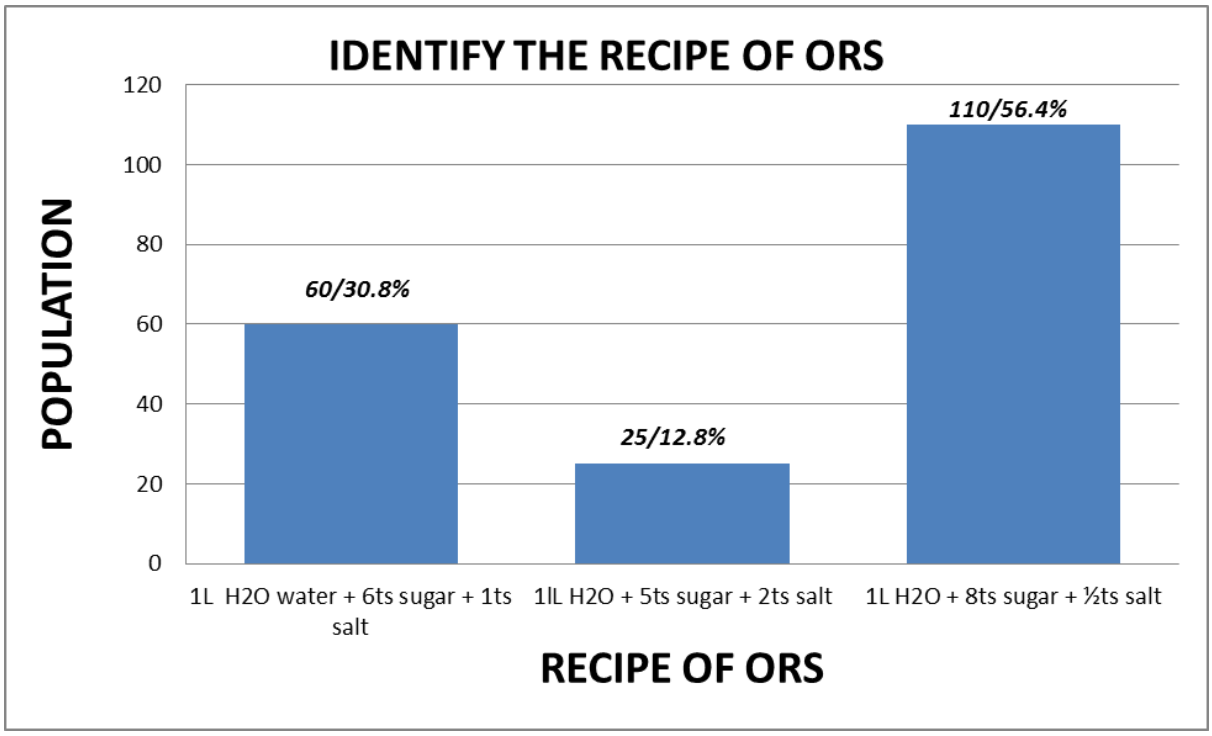


**Figure 4.2: Recipe of ORS**

### 4.4.4 Question 16: Name three danger signs of diarrhoea

Most participants n=84 (43.1%) only knew two danger signs of diarrhoea and n=32 (16.4%) knew no danger signs (Table 4.14).

Having applied the Fisher's exact test, no statistical significant difference was found between the danger signs of diarrhoea and the successful home-based

management of diarrhoea at home (p=4.473). Results also show that of n=51 who treated diarrhoea **at home**, n=39 (76.5%) knew **two danger signs** of diarrhoea, treated diarrhoea successfully. The Fisher's exact test indicated a statistical significant difference between the knowledge of three danger signs of diarrhoea among races and the successful home-based management of diarrhoea (p=0.007).

**Table 4.14: Knowledge on danger signs of diarrhoea**

| Number of danger signs | Frequency (f) | Percentage (%) |
|---|---|---|
| 0 | 32 | 16.4 |
| 1 | 52 | 26.7 |
| 2 | 84 | 43.1 |
| 3 | 27 | 13.8 |
| **Total** | **n=195** | **100** |

### 4.4.5 Question 17: Name the signs of dehydration (lack of fluids) in a child

Table 4.15 shows that n=88 (45.1%) of the participants knew two danger signs of dehydration and only n=25 (12.8%) of the participants knew all three danger signs.

The Fisher's exact test showed no statistical significant difference between the signs of dehydration and the successful home-based management of diarrhoea (p=0.122). Further analyses show that of the participants (n=52), n=36 (69.2%) who knew **two danger signs** of dehydration, treated diarrhoea successfully **at home.**

**Table 4.15: Knowledge about the signs of dehydration**

| Number of signs of dehydration | Frequency (f) | Percentage (% |
|---|---|---|
| 0 | 16 | 8.2 |
| 1 | 66 | 33.9 |
| 2 | 88 | 45.1 |
| 3 | 25 | 12.8 |
| **Total** | **n=195** | **100** |

## 4.5 SECTION D: HISTORY OF DIARRHOEA TREATMENT OF THE CHILD (PREVIOUS YEAR)

The questions in Section D aimed to determine the factors influencing the previous home-based management of diarrhoea. The section was divided into the following segments:

- the age of the child (in months) diagnosed with diarrhoea,
- was the child treated at home,
- if yes, what was the treatment,
- was the treatment at home successful,
- if no, did you seek for medical help,
- if yes, where did you get medical help,
- signs made you to get medical help.

### 4.5.1 Question 18: What was the age of the child that was diagnosed with diarrhoea? (Months)

Most children n=66 (33.8%) diagnosed with diarrhoea were between the ages of 7 – 12 months (Table 4.16).

No statistical significant difference was found between the age of the child and the successful home-based management of diarrhoea as identified by the Fisher's exact test (p=0.240). Children **between 7 and 12 months of age who were treated at home (n=39)**, n=25 (64.1%) were treated successfully and n=14 (35.9%) were treated unsuccessfully.

**Table 4.16: Age of child with diarrhoea (months)**

| Age of child | Frequency (f) | Percentage (%) |
|---|---|---|
| 0-6 | 37 | 19 |
| 7-12 | 66 | 33.8 |
| 13-24 | 61 | 31.3 |
| >24 | 31 | 15.9 |
| **Total** | **n=195** | **100** |

### 4.5.2 Question 19: Was the child treated at home for diarrhoea?

As shown in table 4.17, the majority of participants n=115 (59%) treated their children at home. Only n=80 (41%) of participants did not treat their children with

diarrhoea at home. Results show that of the participants who treated their children **at home** (n=115), n=89 (77.4%) treated diarrhoea successfully.

The Fisher's exact test showed a statistical significant difference between the treatment of diarrhoea **at home** and successful home-based management of diarrhoea (p=0.056). Participants who treated their children at home were more successful than those who treated diarrhoea elsewhere.

**Table 4.17: Treated at home**

| Treated at home | Frequency (f) | Percentage (%) |
|---|---|---|
| Yes | 115 | 59 |
| No | 80 | 41 |
| **Total** | **n=195** | **100** |

### 4.5.3 Question 20: If yes, what was the given treatment?

Most of the mothers and caregivers n=106 (92.2%) treated their children with ORS and n=9 (7.8%) had given other treatments (Table 4.18).

The Fisher's exact test identified no statistical significant difference between the **treatment** given for diarrhoea and the successful home-based management of diarrhoea (p=0.433).

**Table 4.18: If yes, what was treatment? (N=115)**

| Treated at home | Frequency (f) | Percentage (%) |
|---|---|---|
| ORS | 106 | 92.2 |
| Other | 9 | 7.8 |
| **Total** | **n=115** | **100** |

### 4.5.4 Question 21: Was the treatment given at home successful?

Table 4.19 indicates that participants (n=115) who treated the children at home, n=89 (77.4%) treated diarrhoea successfully. The Fisher's exact test showed a statistical significant difference between treatment given at home and successful home-based management of diarrhoea (p=0.000). The management of diarrhoea **at home** was more successful.

**Table 4.19: Was treatment at home successful?**

| Treatment successful | Frequency (f) | Percentage (%) |
|---|---|---|
| Yes | 89 | 77.4 |
| No | 26 | 22.6 |
| **Total** | **n=115** | **100** |

### 4.5.5 Question 22: If No, did you seek medical help?

As stated in table 4.20, all of the participants n=28 (100%) who treated diarrhoea unsuccessfully at home, sought medical help.

**Table 4.20: If no, seek medical help?**

| Seek medical help | Frequency (f) | Percentage (%) |
|---|---|---|
| Yes | 28 | 100.00 |
| No | 0 | 0.00 |
| **Total** | **n=28** | **100** |

### 4.5.6 Question 23: If yes, where did you get medical help?

According to table 4.21, the majority of participants n=20 (71.4%) received medical help at the clinic and n=8 (28.6%) received medical help from the hospital.

**Table 4.21: Received medical help**

| Medical help | Frequency (f) | Percentage (%) |
|---|---|---|
| Clinic | 20 | 71.4 |
| Hospital | 8 | 28.6 |
| **Total** | **n=28** | **100** |

### 4.5.7 Question 24: What sign/s made you decide that your child needs medical help?

Most of the participants n=11 (39.3%) as identified in table 4.22, indicated that the ORS was unsuccessful; therefore they sought medical help. Only n=3 (10.7%) indicated that their children were dehydrated.

**Table 4.22: Decision on signs to seek medical help**

| Signs need medical help | Frequency (f) | Percentage (%) |
|---|---|---|
| ORS unsuccessful | 11 | 39.3 |
| Vomiting | 2 | 7.1 |
| Getting sicker | 8 | 28.6 |
| Dehydrated | 3 | 10.7 |
| Vomiting+ sicker | 3 | 10.7 |
| ORS unsuccessful +vomit + sicker | 1 | 3.6 |
| **Total** | **n=28** | **100** |

## 4.6 SUMMARY

This chapter analysed, interpreted and discussed the collected data. The data gathered, aimed to answer the research question regarding the factors influencing the home-based management of diarrhoea in a rural setting.

The objectives of the study were explored whether the following factors influenced the home-based management of diarrhoea in a rural setting: demographical factors; socio-economic factors; the knowledge of mothers and caregivers about home-based management of diarrhoea; and the participant's previous involvement with the management of diarrhoea. The data analysis was based on the objectives of the study.

Chapter five provides a discussion of whether the objectives of the study were reached. Only 21% of participants knew the correct answers on the knowledge-based questions, while 79% answered incorrectly. The study showed no statistical significant difference between the knowledge-based questions and the age, gender and highest school grade passed. However, the Fisher's exact test indicated a statistical significant difference between the danger signs of diarrhoea and the **races** (p=0.007). The study also showed a statistical significant difference between the **races** and the definition of diarrhoea (p=0.000).The limitations will be identified and recommendations will be made, based on the outcomes of the study.

# CHAPTER 5:
# DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 INTRODUCTION

This study was conducted to determine the factors that influence the home-based management of diarrhoea in children under five years of age in a rural setting. This chapter summarises the conclusions of the findings based on the results in chapter four. Recommendations are made, limitations are outlined and an overall conclusion of the study is described.

## 5.2 DISCUSSION

The purpose of the study was to explore the factors that influence the successful treatment of diarrhoea in children under five at home in a rural setting in the Matzikama Sub-District on the West Coast District of South Africa. The discussion is based on the following objectives: demographic factors; socio-economic factors; knowledge of mothers and caregivers about the home-based management of diarrhoea; and the participant's previous involvement with the management of diarrhoea.

### 5.2.1 Objective: Demographic Factors

The aim of this study was to determine whether the demographic factors had an influence on the home-based management of diarrhoea. These demographic factors were:

#### *5.2.1.1 Age*

The results showed no statistical significant difference between the **age and** the successful home-based management of diarrhoea. However, the majority of n=125 (64.1%) of participants did not know the definition of diarrhoea. The majority of participants between 26-40, (48.6%) defined diarrhoea correctly, which agrees with the study of Ghasemi *et al*. (2013:161) who found that the mothers older than 31 years had a better knowledge about the management of diarrhoea.

#### *5.2.1.2 Gender*

The Fisher's exact test indicated no statistical significant difference between the **gender** and the successful home-based management of diarrhoea (p=1.000).

Most caregivers were females (92.3%) and only (7.7%) of the caregivers were males as shown in table 4.2. The majority of females n=154 (85.6%) knew fewer than three danger signs of diarrhoea, while only one of the 15 male participants knew all three danger signs of diarrhoea. According to Juliet *et al*. (2014:8) however, fathers had little involvement in child rearing, which may lead to decreased responsibility and support of the family.

#### *5.2.1.3 Race*

The results indicated a significant statistical difference between the **races** and the definition of diarrhoea (p=0.000). Only n=56 (35.7%) of Coloureds knew the **correct** definition of diarrhoea, n=13 (36.1%) of Blacks and one (50%) of the White participants. The study also identified a significant statistical difference between the races and the danger signs of diarrhoea (p=0.007). Only n=16 (10.2%) of Coloureds knew all three danger signs of diarrhoea, n=10(27%) of Blacks and one (50%) of Whites.

As described in paragraph 4.2.3, the majority of the Coloured participants had the highest successful outcome of diarrhoea. Kumar (2012:305) stated that racial disparity in the prevalence of diarrhoea occurs due to differences in behaviour, environment and socioeconomic factors.

#### *5.2.1.4 Highest school grade passed*

According to the Fisher's exact test, no significant difference was found between the highest school grade passed and the successful home-based management of diarrhoea (p=0.640).

Mohammed and Tamiru (2014:4) declared that children of mothers who did not attend formal education were more likely to develop diarrhoea compared to children whose mothers did not attend any formal education. In this study of the participants n=140 who passed school between grades seven and eleven, only (55.7%) knew the correct recipe of ORS. The majority of the participants (70.6%)

who passed grade 12 knew the correct definition of ORS. Only (38%) of the participants who passed between grade 0-6 knew the correct definition of ORS. This study identified that the knowledge on diarrhoea was better, the higher the grade passed.

#### *5.2.1.5 Marital status*

The Fisher's exact test indicated no statistical significant difference between the marital status and the successful treatment of diarrhoea at home (p=0.588).

The majority of mothers and caregivers were single (50.3%) as shown in figure 4.1. Only (37.8%) of the single participants, (34.9%) of the married ones, and (34.7%) of the parents living together, knew the correct definition of diarrhoea. However, Othero *et al*. (2008:144) found that marital status was not a significant factor in the home management of diarrhoea.

#### *5.2.1.6 Conclusion*

The study showed no statistical significant difference between the identified demographical factors, except the races and the successful home-based management of diarrhoea in a rural setting. Based on the demographic variables, the knowledge-level on diarrhoea is poor.

### 5.2.2 Objective: Socio-economic Factors

The study aimed to determine whether the socio-economic factors had an influence on the home-based management of diarrhoea in children under five.

#### *5.2.2.1 Number of people living in the house*

As discussed in paragraph 4.3.1, the management of diarrhoea is better in households with an increased number of people living in one house (p=0.003). The Fisher's exact test identified a statistically significant difference between the number of people living in the house and the successful home-based management of diarrhoea. Godana and Mengistie (2013:9) contradicted that the family size was not independently associated with diarrhoeal morbidity.

#### *5.2.2.2 Number of children under five*

No statistical significant difference was found between the number of children under five in the house and the successful home-based treatment of diarrhoea, according to the Fisher's exact test (p=0.352). Diarrhoea is treated more successfully in houses with a reduced number of children under five as discussed in paragraph 4.3.2. In households with one child under five, 76.4% were treated successfully. More intensive care is needed in managing diarrhoea when the number of sick children under five increases.

#### *5.2.2.3 Relation to the child*

Having applied the Fisher's exact test, no statistical significant difference was found between the relationship with the child and the successful home-based management of diarrhoea at home (p=0.948). Most of the participants 70.1% were parents of the children under five years (Table 4.7). This study showed that 76%

(89 of 117) of all cases of diarrhoea were treated successfully, irrespective of the relationship with the child having diarrhoea.

#### *5.2.2.4 Rooms in the house*

The majority of participants, 37.4% had only two rooms in their houses. People with five rooms in the house had a success rate of 100% in their treatment of diarrhoea (Table 4.8). This indicates that diarrhoea is better managed in houses with more rooms.

#### *5.2.2.5 Safe drinking water*

Almost all of the participants, 98.5% had access to safe drinking water (Table 4.9), while 97.8% of these participants were successful in the home-based treatment of diarrhoea. Inadequate coverage of safe water supply and sanitation contributes to diarrhoea among children (Budhathoki *et al*., 2016:5).

#### *5.2.2.6 Electricity*

Most of the mothers and caregivers, 92.8% had electricity at home as indicated in table 4.10. However, 81.8% of those participants with no access to electricity treated diarrhoea successfully. This study shows that diarrhoea could be managed successfully even if electricity is inaccessible.

#### *5.2.2.7 Income source*

A number of participants (34.2%) received a government grant for their children. Results show that of the mothers who received a grant, 77.5% treated diarrhoea

successfully. It could be concluded that diarrhoea could be treated successfully even if families are depended on only a grant as a monthly income. According to Ghasemi *et al*. (2013:161) the social class or the family income might influence the mother's knowledge more than just their own education.

#### *5.2.2.8 Conclusion*

No statistical differences were identified between the socio-economic factors and the successful home-based management of diarrhoea except with the number of people living in a house (p=0.003). Despite the low socio-economic status of participants (34.2%) who received a government grant as a financial income, diarrhoea was treated successfully at home by 77.5% of these participants. Thus, it could be concluded that home-based management of diarrhoea was not influenced significantly by the socio-economic factors mentioned.

### 5.2.3 Objective: Knowledge of mothers and caregivers about the home-based management of diarrhoea

This objective was applied to indicate whether the knowledge of mothers and caregivers about the home-based management of diarrhoea had an influence on the home-based management of diarrhoea in children under five years of age.

#### *5.2.3.1 Definition of diarrhoea*

Only (35.9%) participants knew the correct definition of diarrhoea as shown in table 4.12 of which n=37 (52.9%) of diarrhoea cases were treated successfully. According to Essomba *et al*. (2015:63), the majority of parents (62.2%) defined

diarrhoea correctly, because it was a well-known common disease in Douala, Cameroon. The low knowledge level on the definition of diarrhoea is a concern in the rural setting, because caregivers of children under five need to react on the symptoms of diarrhoea.

#### *5.2.3.2 Information source*

Most of the participants (83.1%) received information about diarrhoea from the clinic as shown in table 4.13. Participants who received information from the clinic had an 80.8% successful outcome in the treatment of diarrhoea. This shows that the clinic is a reliable source of information on the management of diarrhoea. Ghasemi *et al*. (2013:161) revealed that mothers who received information from personal reading and the media had better knowledge than those who received it from their physician or relatives.

#### *5.2.3.3 Recipe of ORS*

Figure 4.1 shows that only 56.4% of participants could identify the recipe of ORS. A deficit in the knowledge of how to prepare ORS correctly could increase the mortality and morbidity rates due to diarrhoea.

Essomba *et al*. (2015:63) found in their study in Douala, Cameroon that less than half of the participants knew how to prepare ORS, and only a quarter knew how to administer it. ORS is the immediate treatment of diarrhoea at home and the preparation and administering should be accurate to get the most effective result.

#### *5.2.3.4 Danger signs of diarrhoea*

As indicated in table 4.14, 16.4% of the participants knew no danger signs of diarrhoea and 43.1% knew only two danger signs. According to the IMCI guideline (2014:27) the danger signs of diarrhoea are: dehydration, losing weight, blood in stool, and a child younger than 12 months of age with diarrhoea. Medical help can be delayed when danger signs of diarrhoea are not recognized by caretakers of sick children. Othero *et al*. (2008:145) found in their study that 76.4% of mothers and caregivers were not able to mention any danger sign of diarrhoea.

#### *5.2.3.5 Signs of dehydration*

As shown in table 4.15, 8.2% knew no danger signs of dehydration, 33.9% only knew one sign of dehydration and only 12.8% knew all three danger signs. Osonwa *et al*. (2016:35) stated that mothers of children, who had a previous episode of diarrhoea, were more likely to identify signs and symptoms of dehydration than those who have not managed diarrhoea before.

#### *5.2.3.6 Conclusion*

The study results showed a statistically significant difference between the information source on diarrhoea and the successful home-based management of diarrhoea (p=0.005). The other identified factors showed no statistically significant difference between the knowledge of participants and the successful home-based management of diarrhoea.

It may be concluded that the knowledge levels of the participants about the diarrhoea is poor. An average of 18.8% of the participants knew what diarrhoea was, the danger signs of diarrhoea, danger signs of dehydration and the r*ecipe of ORS.*

### 5.2.4 Objective: Participant's previous involvement with the management of diarrhoea

This objective was applied to show if the participant's previous involvement with the management of diarrhoea had an influence on the home-based management of children younger than five years. In Douala, Cameroon, about half of the parents with a single child had no experience in the management of diarrhoea, while those with more than one child had some sort of experience according to Essomba *et al.,* (2015:61).

#### *5.2.4.1 Age of the child diagnosed with diarrhoea*

The majority of children, 33%, as indicated in table 4.16 who suffered from diarrhoea were between seven and twelve months. According to the IMCI guidelines (2014:18), the choice for infant feeding is exclusive breastfeeding until six months which protects them against diseases like diarrhoea. Children start to crawl at this age and may inhale contaminated food that can cause diarrhoea. Safe health practices should be in place to prevent infectious diseases.

#### *5.2.4.2 Treated at home*

Most participants (59%) treated their children at home as shown in table 4.17, but 23.9% of these participants were unsuccessful in their treatment. Mohammed and Tamiru (2014:4) found in their study that a large number of mothers, whose children had diarrhoea, did not do anything to manage diarrhoea at home. If signs and symptoms of diarrhoea are identified early enough by mothers and caregivers, danger signs can be prevented if the correct treatment is initiated.

#### *5.2.4.3 Type of treatment at home*

As shown in table 4.18, the majority of participants 92.2% treated their children with ORS at home. Othero *et al*. (2008:145) stated that uncomplicated diarrhoea could be managed successfully at home by continuing to feed the child, giving more liquids and administering ORS correctly. ORS is the preferable choice of initiation of treatment of diarrhoea at home, therefore mothers must know how to prepare and administer it.

#### *5.2.4.4 Successful treatment at home*

Of the 117 participants, 89 (77.4%) treated diarrhoea successfully at home as shown in table 4.19. According to the study findings, there is a significant difference between treatment given at home and successful home-based management of diarrhoea (p=0.000). This is an indication that diarrhoea can be treated successfully at home if mothers and caregivers are knowledgeable about diarrhoea.

#### *5.2.4.5 Seek medical help*

All the participants n=28 who could not treat diarrhoea successfully at home, sought medical help as shown in table 4.22. Ghasemi *et al*. (2013:161) revealed that the care-seeking pattern was related to the number of siblings and mothers with more children who used less professional assistance. If diarrhoea management at home fails, mothers and caregivers need to get professional medical help.

#### *5.2.4.6 Choice of medical help*

Most of the participants 71.4% sought medical help at the clinic as indicated in table 4.21. More than half of the parents (51.7%) in Douala, Cameroon preferred referring their children to the hospital during episodes of diarrhoea (Essomba *et al*., 2015:63). In Matzikama Sub district, the clinics are established in the communities, and thus more accessible to people than the hospital.

#### *5.2.4.7 Signs that need medical help*

The majority of participants (39.3%) indicated that the ORS was unsuccessful and thus had to seek medical help (Table 4.22). Osonwa *et al*. (2016:35) stated that only 15.5% of respondents knew the correct composition of ORS and 84.5% lack knowledge of how to compose ORS. If danger signs of diarrhoea occur and children become sicker, mothers and caregivers must not hesitate to get medical help immediately.

#### *5.2.4.8 Conclusion*

The most vulnerable age for children to get diarrhoea, is between seven and twelve months of age. Diarrhoea is a disease that can be treated successfully at home. Mothers and caregivers need to know how to prepare and administer ORS to prevent dehydration. If danger signs occur, and ORS is unsuccessful, caregivers should know when to seek medical help. If knowledge is poor, diarrhoea cannot be treated successfully at home.

## 5.3 RECOMMENDATIONS

### 5.3.1 Training

#### *5.3.1.1 Professional health care workers*

IMCI training and updates should be offered periodically to health care workers. Nurses need to know how to use the IMCI guideline in the management of any childhood diseases, including diarrhoea.

Continuing health care education for parents and caregivers of children under five, should take place on every visit in health care facilities by nursing personnel.

All nursing staff must know how to use the Road-to-Health booklet as a guide and be able to identify abnormalities and make necessary referrals.

ORT corners must be in place in every health facility and training should be given daily to patients on how to use it.

New policies and protocols on child health care should be communicated immediately and implemented by professional health care workers.

#### *5.3.1.2 Community carers*

Stellenberg *et al*.,*(*2015:4-5) conducted a study in the rural areas of the West Coast District in the Western Cape, South Africa on the knowledge of community care workers about key family practices and obtained the following results:

- 34% scored below 50%;
- the majority of 56% between 50 and 69%;
- only 10% scored between 70 and 89%;and
- none of them scored 90% or more.

This study indicated that the knowledge of community care workers is very poor in the rural setting of the West Coast District and needs to be addressed.

CIMCI training and updates should be offered periodically to community carers.

Training should include knowledge of community child health care, such as:

- definition of diarrhoea
- diarrhoea management at home;
- danger signs;
- when to seek medical help;
- and all aspects regarding child health care included in the CIMCI guideline.

#### *5.3.1.3 Mothers and caregivers*

By applying the Health Believe Model, training is needed to change the personal beliefs of mothers and caregivers. Awareness of ORS as the initial treatment for diarrhoea should be emphasized among mothers and caregivers, instead of traditional medicine.

All mothers and caregivers who attend the baby clinic should be given written pamphlets or booklets with information about diarrhoea, including its management.

Mothers and caregivers need continuous training on how to use the Road-to-Health booklet as a guide for child health, by trained community or health care workers.

Demonstrations, group work and role plays should be given to caregivers and mothers with children under five on a daily basis at the health facilities, regarding the following aspects:

- the preparing and administering of ORS;
- hand wash practices;
- how to manage infectious diseases;
- safe health practices at home.

Frequent health care talks on the definition of diarrhoea, the danger signs of diarrhoea, the signs of dehydration and the treatment given at home for diarrhoea, should take place in the waiting rooms of health care facilities.

### 5.3.2 Social mobilization

#### *5.3.2.1 Technology sources*

such as television, cell phone networks, Facebook, Twitter, internet resources and movies can nationally and globally contribute to the awareness of home-based management of diarrhoea in children under five.

#### *5.3.2.2 Other media sources*

Posters on the management of diarrhoea should be visible in the community.

The local radio station should be given frequent talks and newspapers and magazines should published articles on diarrhoea management, especially in the diarrhoea-season from November to May.

Annual awareness campaigns on diarrhoea and child health should be conducted in the communities.

#### *5.3.2.3 Community sources*

The community health care workers can organise community-based awareness campaigns on the management of diarrhoea in children under five years of age.

### 5.3.3 Family support

Community health care workers need to conduct household assessments of support- systems and do the necessary referrals.

### 5.3.4 Governmental and non-governmental organizations

Communities need to be informed about the services of governmental and non-governmental organizations in the community regarding socio-economic issues.

#### *5.3.4.1 Governmental organizations such as the:*

- Department of Social Development;
- South African Police Department;
- Department of Health and;
- Department of Education can assist in the well-being and protection of all children.

#### *5.3.4.2 Non-governmental organizations like:*

- community health-organizations;
- crèches;
- churches;
- community health forums and;
- foster care- groups can help communities in child health care and other childcare matters.

Unhealthy practices and beliefs should be addressed in communities to ensure the well-being of children.

### 5.3.5 Role of the Department of Health

The Department of Health should address the poor knowledge of mothers and caregivers in their policies and protocols.

Health care professionals need to focus on changes in behaviour of caretakers of children to strengthen safe health care practices.

Health care facilities should constantly support and educate caregivers and mothers when visiting the health care facilities.

### 5.3.6 Research

Research regarding the home-based management of diarrhoea should be conducted in the other fixed clinics in the Matzikama sub district, as well as in other districts in the Western Cape in South Africa.

In addition research should be conducted on the different home-remedies and traditional medicine regarding the home-based management of diarrhoea in a rural setting.

Further research regarding the urban versus the rural management of diarrhoea is recommended.

## 5.4 LIMITATIONS OF THE STUDY

Burns and Grove (2011:48) identify limitations as restrictions in a study that may decrease the credibility and generalizability of the findings, which can be theoretical and methodological.

The study was conducted in only three clinics in the Matzikama Sub district. Preferably a broader geographical area which includes all clinics in the sub district, as well as clinics in other sub districts in the West Coast District of the Western Cape would have improved the generalizability of the study.

## 5.5 CONCLUSION

This study investigated the factors influencing the home-based management of diarrhoea in children younger than five years of age to reduce the morbidity rate. In chapter five the conclusions and recommendations are discussed and compared with literature of previous studies with regard to this topic.

The identified factors that influence the successful home-based treatment of diarrhoea in this study were: the number of people in the house; the information source on the management of diarrhoea; and the successful treatment versus the unsuccessful treatment of diarrhoea at home. Based on the knowledge-based questions of diarrhoea, the knowledge level of mothers and caregivers of children under five is very poor.

The conceptual framework for this study, based on the Health Believe Model and the social learning theory, was applied to guide the studies. The study recommends further research to ensure reduction in child morbidity and mortality globally.

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# APPENDICES

## Appendix 1: Ethical approval from Stellenbosch University

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot • your knowledge partner

### Approved with Stipulations

**New Application**

02-Jul-2014

Hornimann, Harriet HM

**Ethics Reference #: S14/05/120**

**Title: Factors influencing the home-based management of diarrhoea in children under five years in a rural setting.**

Dear Mrs Harriet Hornimann,

The **New Application** received on **28-May-2014**, was reviewed by Health Research Ethics Committee 2 via Committee Review procedures on
**18-Jun-2014**.

Please note the following information about your approved research protocol:

Protocol Approval Period: **18-Jun-2014 -18-Jun-2015**

**Present Committee Members:**

Davids, Mertrude MA

Fernandez, Pedro PW

Rosenkranz, Bernd B

Blaauw, Renee R

Botha, Philip PR

Barsdorf, Nicola

Mills, Lize L

Etoe, Sheila SL

De Roubaix, Malcolm JAM

Moller, Marlo M

Engelbrecht, Susan S

Willett, Derrick DWE

Edwards, C E

Botha, Matthys MH

Ginindza-Ncube, Nondumiso NBQ

The Stipulations of your ethics approval are as follows:

**1. All questionnaires and informed consent documents should also be available in other official languages. In the Western Cape forms should at least be available in Afrikaans, English and Xhosa.**

**2. Information leaflet is addressed to "Dear Colleague" – kindly correct this.**

**3. Questionnaire. Point 15 – kindly correct the scrambled letters for point 3. Question 12: should it be 'Grant' and not 'Grand'.**

**4. Informed Consent process and forms: Please indicate the number of participants that will be recruited in the consent form.**

Please remember to use your **protocol number** (**S14/05/120**) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or

monitor the conduct of your research and the consent process.

**After Ethical Review:**

Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired.

The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected

randomly for an external audit.

Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States

Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of

Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes

2004 (Department of Health).

**Provincial and City of Cape Town Approval**

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape

Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western

Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel:

+27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics

approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at 0219389207.

**Included Documents:**

Investigator CV (Stellenberg)

Investigator declarations (HM, DK, ES)

Questionnaire

Information leaflet

Letter - permission to conduct research study

HREC general checklist

Investigator CV (Kitshoff)

Protocol Synopsis

Protocol

Consent form

HREC New application form

Investigator CV (Hornimann)

Sincerely,

Mertrude Davids

HREC Coordinator

Health Research Ethics Committee 2

## Appendix 2: Permission obtained from institutions / department of health

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 6857; fax: +27 21 483 9895
5th Floor, Norton Rose House., 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za

REFERENCE: WC_2014RP59_660
ENQUIRIES: Ms Charlene Roderick

**P.O.Box 968**
**10 Greystreet**
**Vredendal-North**
**Vredendal**
**8160**

For attention: **Harriet Hornimann**

**Re: FACTORS INFLUENCING THE HOME-BASED MANAGEMENT OF DIARRHOEA IN CHILDEN UNDER FIVE YEARS IN A RURAL SETTING**

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

| | | |
|---|---|---|
| **West Coast** | **D Schoemann** | **Contact No. 021 360 5208** |
| Vredendal North Clinic | | |
| Klawer Clinic | | |
| Vredendal Central Satellite Clinic | | |

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final report within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

3. The reference number above should be quoted in all future correspondence.

We look forward to hearing from you.

Yours sincerely

AD HAWKRIDGE.

**DR A HAWKRIDGE**
**DIRECTOR: HEALTH IMPACT ASSESSMENT**
**DATE:** 8 APRIL 2015.

**CC** **C BESTER** **DIRECTOR: WEST COAST**

## APPENDIX 3: PARTICIPANT INFORMATION LEAFLET AND DECLARATION OF CONSENT BY PARTICIPANT AND INVESTIGATOR


# PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

**TITLE OF THE RESEARCH PROJECT: Factors influencing the home-based management of diarrhoea in children under five years in a rural setting.**

**REFERENCE NUMBER: S14/05/120**

**PRINCIPAL INVESTIGATOR: Harriet M Hornimann.**

**ADDRESS: P.O.Box 968**

**..... Vredendal**

**8160**

**CONTACT NUMBER: 0836262103**

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 **Health Research Ethics Committee at Stellenbosch University** 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 the Medical Research Council (MRC) Ethical Guidelines for Research.

**What is this research study all about?**

- *The study will be conducted in the Vredendal-North and Vredendal-Central clinics in the Matzikama sub-district in the West Coast district .A total of 195 participants will be recruited in the consent form. A sample of 195 participants, 115 of Vredendal-North and 80 of Vredendal-South will take part in the study which represents 10% of the total population of 1950. The population includes all mothers and caregivers of children under five years.*
- *The aim of this study is to investigate the factors influencing the home-based management of diarrhoea in children under five years in a rural setting.*

- *The researcher will interview the participants and pose questions to them as indicated in a questionnaire and tick off the answer of choice by the participants.*

**Why have you been invited to participate?**

- *You have been invited to take part in the study because you are a mother or caregiver of children under five who has to deal with the factors influencing the home-based management of diarrhoea.*

**What will your responsibilities be?**

- *Questions will be asked to you and the researcher will tick off the answer of your choice on a questionnaire. The interview and completion of the questionnaire will take about half an hour of your time.*

**Will you benefit from taking part in this research?**

- *There are no personal benefits if you take part in the study, but with the information you will give there can be improvement on the home-based management of diarrhoea.*

**Are there in risks involved in your taking part in this research?**

- *There are no risks in your taking part in the study.*

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

- *Taking part in the study is voluntary.*

**Who will have access to the information you provide?**

- *The information collected will be treated as confidential and protected. If it is used in a publication or thesis, your identity will remain anonymous. Only the researcher, supervisors and statistician will have access to the information.*

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

No you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

**Is there anything else that you should know or do?**

- You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.
- You will receive a copy of this information and consent form for your own records.

## Declaration by participant

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

I declare that:

- 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.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- 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*) ……..…….. 2005.

| | |
|---|---|
| ..... | ..... |
| **Signature of participant** | **Signature of witness** |

## Declaration by investigator

I *(name)* ……..…… 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 a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) .....…….....…….. on (*date*) ……..…….. 2005.

..... .....

**Signature of investigator** **Signature of witness**

## Declaration by interpreter

I *(name)* ……..…… declare that:

- I assisted the investigator (*name*) …… to explain the information in this document to (*name of participant*) ……..…….. using the language medium of Afrikaans/Xhosa.

- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

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

| ..... | ..... |
|---|---|
| **Signature of interpreter participant and investigator** | **Signature of witness** |

## Appendix 4: Instrument / interview guide / data extraction forms


# RESEARCH QUESTIONNAIRE

## Factors influencing the home-based management of diarrhoea in children under five years in a rural setting.

Reference Number: Ethics S14/05/120 Department of Health: WC_2014RP59_660

**PLEASE INDICATE YOUR ANSWER BY PLACING A TICK (√) IN THE APPROPRIATE BLOCK BELOW OR COMPLETE WHERE NECESSARY**

### SECTION A: DEMOGRAPHIC VARIABLES

**1. Your Age**

(1) ☐ 18-25 (2) ☐ 26-40 (3) ☐ 40-65

**2. Your Gender**

(1) ☐ Male (2) ☐ Female

**3. Your Race**

(1) ☐ Black (2) ☐ White (3) ☐ Coloured

**4. Highest school grade passed**

(1) ☐ 0-6 (2) ☐ 7-11 (3) ☐ 12

**5. Marital Status**

(1) ☐ Single (2) ☐ Married (3) ☐ Divorced (4) ☐ Living together

**SECTION B: SOCIO-ECONOMIC VARIABLES**

**6. How many people live in the house?**

(1) ☐ 1-3 (2) ☐ 4-6 (3) ☐ 7-10 (4) ☐ above 10

**7. How many children under five live in the house?**

(1) ☐ 1 (2) ☐ 2 (3) ☐ 3 (4) ☐ 4 (5) ☐ 5 (6) ☐ above 5

**8. What is your relation to the child?**

(1) ☐ Parent (2) ☐ Caregiver (3) ☐ Other- specify…….....

(4) ☐ Parent & Caregiver (5) ☐ Caregiver & Other (6) ☐ Parent & Caregiver

**9. How many rooms are in your house?**

(1) ☐ 1 (2) ☐ 2 (3) ☐ 3 (4) ☐ 4 (5) ☐ 5

**10. Do you have clean, safe drinking water?**

(1) ☐ Yes (2) ☐ No

**11. Do you have electricity?**

(1) ☐ Yes (2) ☐ No

**12. What is your source of financial income per month?**

(1) ☐ Grant (2) ☐ Salary (3) ☐ Pension (4) ☐ Other (5) ☐ Grant & Salary

(6) ☐ Grant, Salary & Pension (7) ☐ Salary & Pension

(8) ☐ Grant & Pension (9) Salary & Other

**SECTION C: KNOWLEDGE**

**13. What do you understand under the term "diarrhoea"?**

(1) ☐ two watery stools in 24h (2) ☐ two soft stools in 12hours

(3) ☐ three loose stools in 36h (4) ☐ three to four watery stools in 24h

**14. Name a source where you can get information on how to treat diarrhoea?**

(1)Clinic (2)Hospital (3)Other:……

**15. Identify the recipe of the Oral Rehydration Solution (ORS).**

(1) ☐ 1litre boiled water (2) ☐ 1litre boiled water ( 3) ☐ 1litre boiled water

| | | |
|---|---|---|
| 6teaspoons sugar | 5teaspoons sugar | 8teaspoons sugar |
| 1teaspoon salt | 2teaspoons salt | ½ teaspoon salt |

**16. Name three danger signs of diarrhoea**

……1

…… 2

……3

**17. Name the signs of dehydration (lack of fluids) in a child.**

……1

……2

……3

## SECTION D: HISTORY OF DIARRHOEA TREATMENT OF THE CHILD (PAST YEAR)

**18. What was the age of the child that was diagnosed with diarrhea? (months)**

(1) ☐ 0-6 (2) ☐ 7-12 (3) ☐ 13-24 (4) ☐ >24

**19. Was the child treated at home for diarrhoea**

(1) ☐ Yes (2) ☐ No

**20. If yes, what was the given treatment?**

(1) ☐ ORS (2) ☐ Other-specify……

**21. Was the treatment given at home successful?**

(1) ☐ Yes (2) ☐ No

**22. If No, did you seek for medical help?**

(1) ☐ Yes (2) ☐ No

**23. If yes, where did you go to get medical help?**

(1) ☐ Clinic (2) ☐ Hospital (3) ☐ Other-specify

**24. What sign/s made you decide that your child needs medical help?**

(1) ☐ ORS was unsuccessful (2) ☐ Vomiting

(3) ☐ Getting sicker

(4) ☐ Looking dehydrated (5) ☐ Other-specify……

(6) ☐ Vomiting & Getting sicker (7) ☐ Vomiting, Getting sicker & Dehydrated

(8) ☐ Getting sicker, dehydrated (9) ☐ ORS was unsuccessful, getting sicker

(10) ☐ ORS unsuccessful, Vomiting & getting sicker

(11) ☐ ORS unsuccessful, Vomiting, getting sicker & dehydrated

(12) ☐ Vomiting & Looking dehydrated

## Appendix 5: Declarations by language and technical editors

Lona's Language Services

English/Afrikaans
Afrikaans/English

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* Translations * Editing * Proof Reading
* Transcription of Historical Docs
* Transcription of Qualitative Research
* Preparation of Website Articles

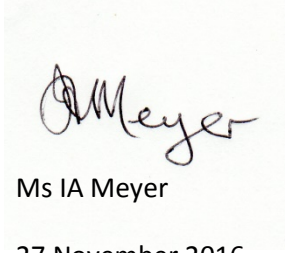
***TO WHOM IT MAY CONCERN***

This letter serves to confirm that the undersigned

**ILLONA ALTHAEA MEYER**

has proof-read and edited the document contained herein for language correctness.

Signed



Ms IA Meyer

27 November 2016

**FOR: HARRIET MILLICENT HORNIMANN**

**TITLE: FACTORS INFLUENCING THE HOME-BASED MANAGEMENT OF DIARRHOEA IN CHILDREN UNDER FIVE YEARS IN A RURAL SETTING**

## Appendix 6: Declarations by language and technical editors

Lize Vorster Communication

To whom it may concern

This letter serves as confirmation that I, Lize Vorster, performed the technical formatting of Harriet Millicent Horniman's thesis. This entails complying with the Stellenbosch University's technical requirements for theses and dissertations, as presented in the Calendar Part 1 – General. Please note that this thesis was done under great time pressure and may contain inconsistencies, which will be corrected should this come to the light.

Yours sincerely

Lize Vorster
Language Practitioner