KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF CAREGIVERS ON MANAGEMENT OF CHILDHOOD DIARRHOEA AMONG CHILDREN AGED BETWEEN 0-5 YEARS ATTENDING CHILD WELFARE CLINIC (CWC) IN MOGODITSHANE VILLAGE, BOTSWANA

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DECLARATION

I Gofaone Jessica Mosweu, declares that this research report is my original work. It is being submitted for the Degree of Masters of Science in Child Health at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

The *24th* day of January, 2018

DEDICATION

I would like to dedicate this to my son Motlatsi Benedict Mosweu and my mother Mosamaria Mosweu.

ABSTRACT

Background: Diarrheoa continues to plague on Botswana children, resulting in high mortality of children below five years. In 2015 childhood diarrheoa accounted for 6 percent of deaths of children in Botswana. Good knowledge, attitude and practices of caregivers is pivotal to protection, prevention and treatment of childhood diarrhoea, hence reduce mortality thereof.

Study aim: The aim of the study was to determine the level of Knowledge, Attitudes and Practices (KAP) of caregivers on management of childhood diarrhoea among children between 0 to 5 years attending childwelfare clinics in Mogoditshane village, Botswana.

Methodiology: A cross-sectional survey with a convenience sampling was used to select participants. A structured questionaire was used to collect data from 84 respondants regarding demography, knowledge, attitudes and practices on management of dirrhoea in children. Data was analyzed using Epi Info software. Descriptive statistis included measures and frequency tabulations and and inferential statistics included cross-tabulations to investigate statistical associations with KAP were used for analysis. Multiple logistic regression models were used to determine factors associated with KAP.

Results: The study found inadequate KAP among caregivers that was significantly associated with gender and level of education. Gender was significantly associatedwith level of knowledge ($p<0.001$) and level of practice ($p= 0.04$) while level of caregivers education was significant with level of attitude. ($p= 0.015$). There was no statistical significant relationship found between KAP variables. Practice and knowledge (p-value close to 1), practice and attitude ($p=0.70$), attitude and knowledge ($p=0.66$). Mean age was 30 years (SD=8.38). 26 (32%) had good knowledge and 58 (68%) had moderate knowledge. The mean score of respondents' attitudes was 14.33 (SD= 3,178) with 36 (43%) having good attitudes towards the prevention and treatment of diarrhoea while 48 (57%) had poor attitudes. 28(57%) of caregivers had good practices and (71%) had poor practices.

Conclusion: Existing public health programs targeting prevention of diarrhoea and dehydration should consider gender, level of education, perceptions and beliefs of caregivers when planning for interventions.

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LIST OF ABREVIATIONS

ACSD	**A**ccelerated Child Survival and Development
BFHS IV	Botswana Family Health Survey
CWC	Child Welfare Clinic
CSS	Community Support Strategy
GAPPD	Global Action Plan for Pneumonia and Diarrhoea
GDHMT	Great Gaborone District Health Management Team
HREC	Health Research Ethics Committee
IMCI	Integrated Management of Child Illness
IMR	Infant Mortality Rate
KAP	Knowledge Attitudes Practices
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
MCEE	Maternal and Child Epidimiology Estimation
MICS	Multiple Indicator Cluster Surveys
MOH	Ministry of Health
MSD	Moderate to Severe Dehydration
U5MR	Under five mortality rate
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

This chapter discusses the global and national burden of diarrhoea, prevention and treatment. It also presents the statement of the probem, justification, aims and objectives.

1.1.1 GLOBAL BURDEN OF CHILDHOO DIARRHEA

Globally, childhood diarrhoea contributes to a major proportion of under 5 (U5MR) and infant mortality (IMR) rates (1). In 2015, diarrhoea accounted for 9% of childhood mortality worldwide andabout 1,400 children were dying every day thus 526,000 a year (1). Low and middle income countries carry a dispropotinate share of the burden of diarrhoeal deaths. Diarrhoeal diseases are poverty related . Highest number of deaths due to diarrhoea (70%) occur among children less than two years of age living in Sub Saharan Africa and South Asia related to poor environmental conditions (1).

Global efforts to protect, prevent and manage diarrhoea among children has been made over the past few decades and were successful.The annual diarrhoea deaths decreased by 50 percent from 2000 to 2015 (1). The deaths dropped from 1.2 million to 526.00 (1). UNICEF report showed that in 2015 only, GAPPD strategy averted about 900,000 diarrheal deaths(1). It is therefore pertinent that moving towards post 2015 development agenda, public health interventions need to focus on reducing child mortality and morbidity associated with diarrhoea putting emphasis on the most impoverished places.

1.1.2 CHILDHOOD DIARRHOEA IN BOTSWANA

Diarrheoal disease is the leading cause of illness among under-five year old children in Botswana, accounting for 20 % of under 5 mortality. It forms a vicious circle with malnutrition. In 2015 only, diarrhoea accounted for 6% of childhood deaths translating to 157 deaths (2). Even though, there has been a decline in diarrhoeal cases over the past few years, the number still remain considerably high (figure 1). There is diarrheoa outbreak every year in Botswana, resulting in deaths and acute diarrhoea is commonest type. Rota virus is the main agent leading to diarrhoea in Botswana (3). Moreover, Human Immunodeficiency Virus (HIV), malnutrition and low promotion of breastfeedingare additional risk factors for childhood diarrhoea in Botswana (2-4).

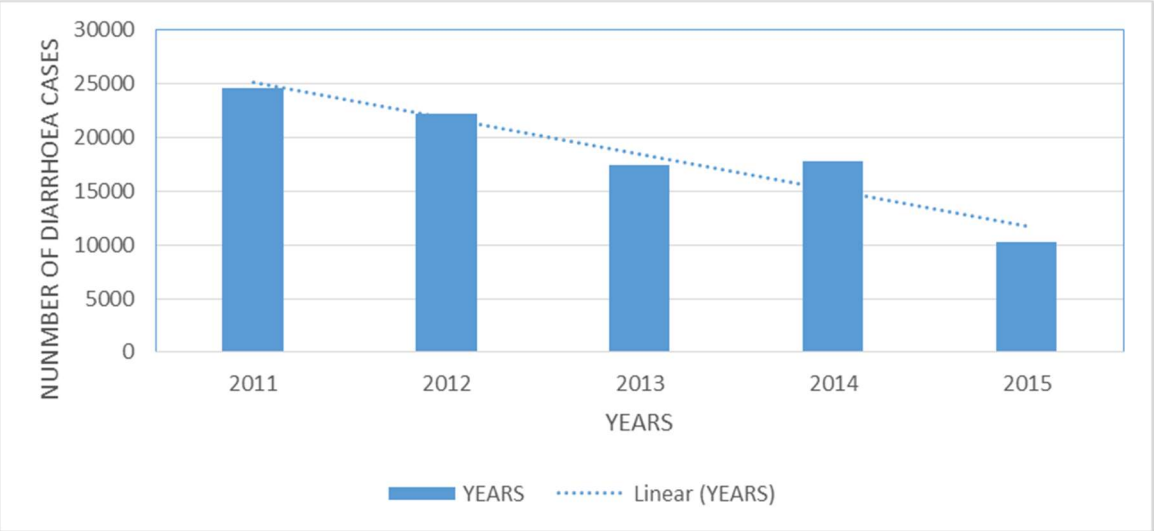

Figure 1: TRENDS OF CHILDHOOD DIARRHOEA IN BOTSWANA 2011-2015

Source: IDSR MOHW

1.1.3 THE CONCEPT OF DIARRHOEA

Diarrhoea is a symptom of infection in the intestinal tract characterised by a passage of watery stool more than three times in twenty four hours or one stool with pathological content accompanied by vomiting (1). There are three types of diarrhoea; acute diarrhoea, persistent diarrhoea and diarrhoea with blood. Acute diarrhoea lasts for less than 14 days and leads to rapid dehydration, weight loss and eventually death. Persistant dairrhoea lasts for more than 14 days. This type of dairhoea worsens malnutrition and increases the risk of infection due to reduced immunity. Diarrhoea with blood in the stool also called dysentery, has potential to cause anorexia, rapid weight loss and damage to the intestinal mucosa which may inturn expose the child to sepsis and death. Acute diarrhoea is the main cause of concern,because it results in severe dehydration within a short preiod of time (1).

Diarrhoea is caused by different types of infectious organisms such as virus, bacteria and parasitic pathogens which are mainly water and food borne and are acquired through faecal-oral route (1,5-6). They are most prevalent in settings with poor hygiene and lack of access to clean drinking water and sanitation(1).The Global multicenter study group conducted a prospective case control study at six sites in Africa and Asia to investigate the causes, incidence and the impact of moderate to severe diarrhoea (MSD), characterised by severe dehydration, dysentery and and hospitalisation (6). Among all pathogens found, rotavirus was the leading cause of MSD across all study sites. Rotavirus causes over nine million cases of diarrhoea and almost 200,000 deaths every year worldwide (6).

A vicious cycle exists between diarrhoea and malnutrition. Diarrhoea depletes body fluids causing severe dehydration. If dehydration is not corrected, itresults in the loss of essential nutrients, leading to micronutrient deficiencies and severe malnutrition in children. In addition,nutritional deficiencies alter the immune system, resulting in risk of diarrhoea (1).

1.1.4 MANAGEMENT OF CHILDHOOD DIARRHOEA

Diarrhoeal diseases are manageable with cost effective interventions which areclassified as protective, preventive and curative. Protective interventions keep children healthy and free of disease. These include exclusive breastfeeding, adequate complementary feeding, continued breastfeeding and vitamin A supplementation. Preventative interventions stop disease transmission and prevent children from becoming ill. They include immunization, safe drinking water, sanitation and hygiene and HIV prevention.Treatment interventions cure children of diarrhoea and ensure their survival. They include improved care seeking and treatment with ORS and zinc (1,10).

PROGRAMMES AND STRATEGIES IN PLACE TO ADDRESS DIARRHOEA MORTALITY

The IMCI Strategy

In 1990 WHO and UNICEF recommended the IMCI strategy to assist health workers to manage childhood illness. The strategy provides an integrated algorithm that makes it easy for the health worker to follow, classify and manage common childhood conditions. It further puts emphasis on protection and prevention through immunization, improved nutrition and counselling of the families on healthy behaviours and practices (1). IMCI has helped with prompt reaction to common childhood illness since access to diagnostic, laboratory personnel and proper infrastructure are scarce in LMIC, where most children suffer (1).

Furthermore, since many childhood illness symptoms manifest at home in the community, the strategy was simplified and adopted for use by lay community workers and caregivers in their local settings, thus putting a community component (iCCM). The iCCM bridges the existing distance gap among communities that reside far from the formal health systems and therefore remain are undeserved. It emphasises teaching the mother on detecting danger signs, use of ORS and referral for immunisation. It also bridges the human resources shortage gap, given that there is already a shortage of the health workers. Community-based interventions are effective at achieving higher treatment coverage for diarrhoea (10). Interventions at the community level are estimated to increase care-seeking for diarrhoea by 9 %. They can increase ORS usage by an estimated 160% and zinc use by 80 %(11). The interventions

delivered by the community care workers are estimated to have significantly increased levels of care seeking behaviour for neonatal morbidity by 52 percent (12).

The Integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD)

WHO and UNICEF have developed and recommended a new Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea, considering that both diseases affect children significantly and tackling them does not need major advances in technology (1). The Integrated Plan builds upon previous plans and aims to help countries meet the goal of ending these preventable diseases by establishing healthy environments and promoting practices that are known to protect children from these ailments (1). The figure below presents the GAPPD framework. The GAPPD strategy averted about 900,000 diarrhoeal deaths (1).

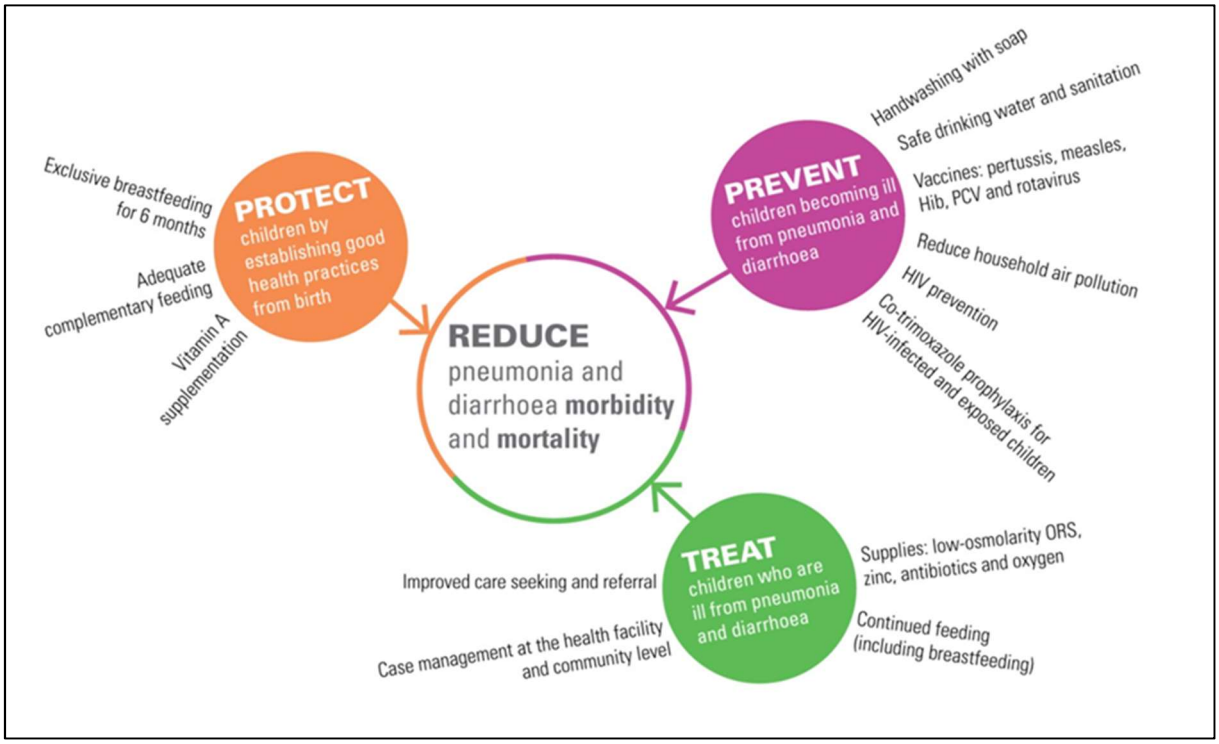

Figure 2: THE GAPPD FRAMEWORK

Source: Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD)

1.1.5 BOTSWANA'S RESPONSE TO CHILDHOOD DIARRHOEA

Botswana experiences outbreaks of childhood diarrhoea yearly resulting in high morbidity and mortality. In 2001, through its ministry of health, Botswana implemented IMCI, starting with few districts and eventually scaling it up to all parts of the country (2). However, adherence to the guidelines has remained a challenge (8-9). Recently the country adopted ACSD to scale up treatment intervention and availability of treatment commodities (ORS and Zinc tablet) at the household level, resulting in every child being given two packets of ORS and two zinc tablets at every CWC visit (2). In 2012, the country improved EPI program by adding rotavirus vaccine in the routine schedule. There is also a young infant feeding program to protect children from malnutrition, hence prevent the effect of diarrhoea. The feeding program includes routine vitamin A supplementation. In addition, there is scale up of prevention of mother to child transmission (PMTCT) program to address HIV associated diarrhoeal morbidity. In Botswana, healthcare is delivered through a decentralized system with primary health care being the pillar of the entire delivery system. The country has an extensive network of health facilities (hospitals, clinics, health posts and mobile stops) clustered in the 27 Health Districts. Diarrhoea treatment interventions are delivered through these platforms. Even though supply, monitoring and evaluation of these programmes are a challenge, all these efforts have made significant success in the reduction of diarrhoeal diseases among children.

1.2 STATEMENT OF THE PROBLEM

Diarrhoeal disease continues to kill children in Botswana. Childhood diarrhoea accounted for 6% of all causes of deaths among children aged below five years in Botswana in 2012, positioning it as the second leading cause of deaths, after pneumonia (2). Moreover, diarrhoea affects the quality of life of a family as a whole (13). Diarrhoea also weighs heavily on family resources like time and money. Diarrhoea is prevalent across regions in Botswana with Mogoditshane being among villages with frequent and high prevalence of diarrhoea, especially during rainy seasons.

Interventions to address childhood diarrhoea in Botswana include (2) pipedwater use, flash toilets availability and improved latrines. Other interventions to address childhood diarrhoea include; provision of IEC campaigns, community mobilisation meetings and using media to

share information on, immunisation, young feeding programand supply of ORS and Zinc.Through these interventions, there was a significant reduction in diarrhoea, although more could have been done to reduce it further (2).

Ineffective management practices by both health workers and caregivers compromise the efforts to reduce diarrhoea incidences (8-9). The report from UNICEF Botswana has shown low utilisation of ORS and Zinc by caregivers at home among children related to all types of diarrhoea admitted at referal hospitals in Botswana (2).The primary caregivers have a significant role in prevention and treatment of diarrhoea, their knowledge, attitudes and practices determine the quality of care they provide to children for survival and development (14). Considering the poor management of childhood diarrhoea at home/community level it is important to know the level of knowledge, attitudes and practices of caregivers in diarrhoea management in children, hence the present study.The KAP survey is the suitable diagnostic tool for the assessment.

1.3 AIM OF THE STUDY

The aim of the study was to determine the level of Knowledge, Attitudes and Practices of caregivers on management of childhood diarrhoea among children aged between 0 to 5 years attending Mogoditshane, Nkoyaphiri and Lesirane clinics in Mogoditshane village in Botswana.

1.4 OBJECTIVES OF THE STUDY

- To describe thesocio- demographic characteristics of caregivers.
- To determine levels of knowledge, attitudes and practices among caregivers on prevention and treatment of diarrhoea.
- To determine the association between socio-demographic characteristics and KAP outcome variables.
- To determine theassociationbetween the KAP outcome variables.

1.5 JUSTIFICATION OF THE STUDY

Botswana has responded well with regard to childhood dirrhoea. The country has been implementing various interventions to reduce from diarrhoea-related mortality. However, despite these efforts, childhood diarrhoea still contributes majorly to morbidity and mortality. Mogoditshane has a high prevelance of childhood diarrhoea. Given that there is a lack of evidence both at national level in Botswana and at a local level in Mogoditshane regarding knowledge, attitudes and practices of caregivers, this type of research is critical. This research study will be useful to provide critical insights on the way care givers manage their children when having diarrhoea as opposed to the recommended practice. A better understanding of caregivers knowledge, attitudes and practices on management of childhood diarrhoeas can potentially assisst in effective planning and implementation of targeted interventions. Furthermore, this study will also reflect on the perfomance of current health promotion strategies aimed at improving maternal education on child health. To future researchers, findings from this study can provide baseline information on the current status of caregivers awareness on childhood diarrhoea in Mogoditshane which can be utilised for designing and testing interventions on diarrhoea management.

1.6 LITERATURE REVIEW

1.6.1 WATER, SANITATION AND HYGIENE FOR PREVENTION OF CHILDHOOD DIARRHOEA

Diarrhoea is strongly associated withlack of safe drinking-water, adequate sanitation and hygiene (1). It results from the ingestion of pathogens found in water that is contaminated with faeces. Preventative measures to improve access to clean drinking water, sanitation and hygiene are translating into fewer diarrhoea-related deaths in a number of countries. A review by Cairncross et al (15) found diarrhoea risk reduction of 17% with improved water.

The effects of handwashing on childhood diarrhoea have been studied in depth (16-18).Hand washing at critical times, especiallyafter toilet use and before the preparation of food significantly reduces the episodes of diarrhoea (16). Handwashing with soap has the potential to reduce risk of diarrhoea by42- 48% (17). Additionally, besides hand washing with soap, handwashing with water alone can significantly reduce childhood diarrhoea. In Bangladesh,

participants who washed both hands with water only (OR=0.67; 95% CI=0.51–0.89) had less diarrhoea (18). In areas where there is no soap, hand washing should be encouraged, the same as in areas where soap is available. In spite of such evedence, caregivers do not wash hands at critical times, which puts their children at risk of contamination, ultimately leading to diarrhoea. Hand washing promotion resulted in 30% reduction in diarrhoea for children and adults in high income and low- and middle-income countries (15).

Poor sanitation also exposes children to diarrhoea. Diarrhoea incidence can be significantly reduced by the improvement of household water, sanitation and hygiene. Hygienic disposal of children's stools and proper hand washing with soap are best practices for prevention of diarrhoea(19), therefore intensive behavioral change interventions are needed in Water Sanitation and Hygiene (WASH) strategies.

1.6.2 BREASTFEEDING FOR PROTECTION OF CHILDHOOD DIARRHOEA

Breastfeeding as prevention and treatment of diarhoea and dehydration

Diarrhoea results in depletion of electrolytes and nutrients in the body. Breastfeeding replaces lost nutrients resulting from diarrhoea episodes, preventing further dehydration and malnutrition (20). Huffman et al attested that breast-milk helps to maintain both hydration and nutritional status during diarrhoea episodes (21). Suboptimal or lack of breastfeeding is associated with increased diarrhoea diseases cases in developing countries (22-23).Lack of breastfeeding resulted in excessive risk of diarrhea incidence (RR 1.32) in infants 6-11 months and a high prevalence (RR 2.07), mortality (RR 2.18) and all-cause mortality (RR 3.69) in infants 6-23 months (22).

Breastfeeding improves diarrhoea outcomes

Conversely,better breastfeeding practices prevented hospital admissions due to diarrhoea in Vietnam and Qatar (23,24).This type of protection has been found tobe higher among infants who are exclusively breastfed in the first 6 months of life (21).Nevertheless, despite the wealth of evidence on the effectiveness of breastfeeding, feeding during the diarrhoeal episode is minimal in areas with high diarrhoea morbidity (25). A longitudinal study found that 90% of caregivers withheld breast milk and other food during episodes of diarrhoea based on a belief that it worsens diarrhoea (25). The evident vicious cycle of malnutrition and diarrhea can be broken by continuous feeding during diarrhoea episodes.

1.6.3 ROTAVIRUS VACCINE FOR PREVENTION OF CHILDHOOD DIARRHOEA

In low and middle income countries, diarrhoea is mostly caused by rotavirus. In 2008, diarrhoea attributable to rotavirus infection resulted in 453, 000 deaths (37%) worldwide (26). The infection is common among infants less than <1 year and lower in older children (27).The vaccine to prevent the infection has been found and has by far demonstrated remarkable results. Despite concerns that still exist over intussusception resulting from the vaccine (28), 81 countries had introduced rotavirus vaccines into their national immunization programmes by May 2016 (25). There was a decline in incidences of diarrhoea in Botswana after the introduction of rotavirus vaccine(30).The reductions of 43% (95% CI, 34%-51%) in gastroenteritis hospitalizations and 48% (95% CI, 11%-69%) in gastroenteritis deaths among infants <1 year of age was experienced in Botswana (30). Similarly, Mexico has also documented a sustainable decline in diarrhoea-related hospitalizations and deaths post vaccine years (32).

1.6.4 USE OF ORAL REHYDRATION THERAPHYAND ZINC FOR TREATMENT OF CHILDHOOD DIARRHOEA

Acute diarrhoea results in severe dehydration and malnutrition in children and consequently mortality (1). Oral rehydration therapy is an effective and efficacious treatment intervention for diarrhoea. The Oral Rehydration Solution (ORS) replaces fluids lost during diarrhoea and reducesstool volume (33). A review of 157 papers on ORS, estimated that itcan prevent 93% of deaths(33). In spite of this evidence, caregivers still prefer alternative treatment than ORS (34). ORS was incorrectly prepared and sub-optimally used at home among caregivers in Zambia (35) while in Gambia, only 17 % gave ORS (36). The reason for inadquate use ranges from refusal by child due to taste, lack of faith on it by caregivers and limited availability (37). This lack of buy in calls for use of strategies such as the use of mass media to promote ORS. In a metaanalysis comparing study involving two groups of caregivers, the results showed that those exposed to mass media were 2.05(95%, 0.78-5.42) times likely to treat their children with ORS than their counterparts who had not been exposed (38).

It has also been found that zinc supplements reduce the duration of diarrhoeal episodes by 25% and are associated with a 30% reduction in stool volume (39). However, children in developing countries have zinc deficiency which places them at risk of persistent diarrhoea (39). Although zinc reduces stool volume, there is no evidence that supports its use among children below six months who are vulnerable to diarrhoea (39). In addition, availability and

access to zinc supplements is low in many regions of the world. It has been proven that combination of oral rehydration solution and administering of zinc supplements are life savers, therefore delivery platforms should be strengthened to improve access to these commodities. Harnagle et al (40) opined that education on the use of oral rehydration solution and zinc should be included at Antenatal Clinic (ANC) visits. This could be an important part of the strategy as it has the potential to directly scale up the availability and accessability of zinc to the children in need.

1.6.5 CAREGIVERS DEMOGRAPHIC FACTORS ASSOCIATED WITH PREVETION AND TREATMENT OF CHILDHOOD DIARRHOEA

Caregivers' demographics have been associated with management of childhood illness. Parity, level of education, age and other socioeconomic factors have been associated with the caregivers' ability to practice good management .

The number of children a caregiver has determines how good the caregiver can care for a child. Well experienced caregivers are those with more children and the more they get exposed the better their practice. Ghassemi et al (41) found a significant relationship between parity and knowledge of the mother on child care in Iran.

The importance of caregivers level of education in management of childhood illness was identified by many studies (25,36). The strength of association was high between educational status and good practice of diarrhoea management (25). Caregivers with formal education were 3 times likely to use oral rehydration solution (AOR = 3.01, CI = 1.41–6.42) and 3.2 times likely to visit the clinic (AOR = 3.32, CI = 1.56–7.07) in Kenya (25). Similarly, in a study conducted in Ethiopia (42) increased incidences of diarrhoea were found among children whose mothers had lack of education. Althoughstudies vary on findings on the relationship between level of education and management of diarrhoea,many found a strong association of the two meaning that caregivers' education on child survival remains significant.

In addition to other demographics, age of a caregiver is a very important variable on childhood diarrhoea and its management (43-44). Higher maternal age correlated with higher practice and KAP scores in a study in Gambia (36).Caregivers'demographic factors are strong predictors of KAP on management of diarrhoea,therefore public health policies and

programmes should consider demographic characteristics during the planning phase of strategies to address childhood diarrhoea.

1.6.6 THE ROLE OF CAREGIVERS ON MANAGEMENT OF DIARRHOEA: KNOWLEDGE, ATTITUDES AND PRACTICES (KAP)

Diarrhoea starts at home and its prevention and treatment is initiated at home by caregivers. Caregivers play a pivotal role in prevention and treatment of childhood diarrhoea (14,43). Prevention and early treatment of childhood diarrhoea reduce child mortality. The level of KAP of caregivers is significant in the management of childhood diarrhoea. When caregivers have the knowledge, with good attitude, they are able to effectively prevent and treat diarrhoea at home. Knowledge of the concept of diarrhea and good attitude towards diarrhoea results in good management practices (44). In Ethiopia, good knowledge and attitudes of caregivers on management of diarrhoea resulted in low incidences of childhood diarrhoea among children of mothers in the study (42). However, despite the premise, studies have found poor KAP of caregivers on management of diarrhoea and variation in KAP of mothers among different regions of African and the rest of the world (25,51). Carter et al (51) reported poor perceptions on diarrhoea and its treatment. Caregivers restricted fluids, and feeds during diarrhoea episode and gave inappropriate medication instead. Diarrhoea was perceived to be a normalillness and therefore treated lightly. In Kenya caregivers withheld feeds with the perception that it enhanced diarrhoea (25). Caregivers were accustomed to the use of antibiotics and antidiarrhoeals on acute diarrhoea than the recommended ORS and zinc (45). Knowledge and attitudes of mothers, recognizing the danger signs of dehydration due to diarrhoea, and the prevention and management of childhood diarrhoea diseases were not adequate in north west Ethiopia (45-46).

In summary, a number of KAP studies have been undertaken within different settings in African countries. These studies raise interesting issues to keep in mind from the mixed results in the relationship between education level, knowledge, attitude and practice about management of diarrhoea among caregivers. Caregivers perceptions and cultural beliefs bore weight on the caregivers decision towards management of diarrheoa. These studies highlighted the impotance of caregiver health education in the general care of the child. Most of the studies reviewed were quantitative, and therefore did not explore more on why

caregivers choose to manage diarrhoea the way they managed it.Given this, more qualitative studies on management of diarrhoea are needed. In addition, results from studies were specific to those communities of study and not generalizable to populations in other communities. The studies targeted the head of household as a proxy to the Knowledge, Attitudes and Practices held by all members of the household, which attracted information bias. More methodologies that have less or limited bias should be employed in studies regarding KAP.

CHAPTER TWO

2.0 METHODS

This chapter presents the research methodology including study design, setting, population, sampling process, data collection tool and procedure, data management and analysis. It also addresses the ethical considerations.

2.1 STUDY DESIGN

The study was quantitative and was based on adescriptivecrosssectionalsurvey to capture information from participants.

2.2 STUDY SETTING

The study was conducted in Mogoditshane Village in Botswana (figure 4). Mogoditshane is the second largest village in Kweneng east district of Botswana (48). It is situated 10 km from the capital city Gaborone. The village has anestimated general population of 58,089 residing in both slums as well as formal sections of the village.There is adequate public transport and the residents have access to at least one form of mass media. Seventy-five percent of the residents in Mogoditshane can read and write (23). About 90% of households in Mogoditshane use flush toilets and tap water and about 10% (23) still have pit latrines. The study was conducted in Mogoditshane because it has a high prevelance of childhood diarrhoea.

Mogoditshane village has three clinics that are open to the public.Of the three clinics, only two operate 24 hours and one operates 8 hours. CWC services (immunisation and growth monitoring) are offered during the day with a booking system. About 70-100 underfive children are booked every day from Monday to Friday.

2.3 STUDY POPULATION

The study population included caregivers (men and women) who brought children to the well-baby clinic for routine immunizations and growth monitoring, whose child's age ranged from 0-5 years and are registered at any of the three child welfare clinics (CWC).

THE MAP OF KWENENG EAST

Figure 3: THE MAP OF KWENENG EAST

2.4 SAMPLING

Epi Info statistical package was used for sample size calculation. With 95% confidence level and 10% precision and assuming 38 % level of knowledge of management of diarrhoea among caregivers found in a previous study conducted in similar setting, i.e, South Africa (23),a total sample of 84 caregivers with children aged between 0 to 5 years were interviewed between September and October 2016.

The entire population size of children registered in the three child welfare clinics (CWC) in Mogoditshane was 4200. The three clinics were Mogoditshane, Lesirane and Nkoyaphiri, in which total number of registered children per clinic in 2016 was 1700,1200 and 1300 respectively. Based on the total registered children, a stratified sample formula was used to calculate the proportion of participants to be drawn from each clinic, 34,24 and 26 participants were sampled from each clinic respectively. Recruitment into the study was based on participants who visited the clinics and fulfilled the inclusion criteria. During the period of data collection, participants were approached at the CWCs waiting room everyday in the morning and were given information about the intention of the study and their participation was requested. Those who agreed and met the inclusion criteria were interviewed. The caregivers were approached and interviews were conducted only after the consultations were finished and they had received the health services they came for. This was done to ensure that routine health service delivery was not affected due to the process of data collection. The participant who agreed to participate was taken to the interview room depending on his/her availability. Ten participants were interviewed per day until the desired sample size was reached.

Inclusion criteria:

1. Caregivers (Men and women) aged 18 years and above who have stayed in Mogoditshane since three months priorto the study.
2. Caregivers who have brought their child (0-5years) for routine immunization and growth monitoring and registered in that clinic
3. The child should have had an episode of diarrhea in the last three months prior to the date of data collection.

Exclusion criteria:

The caregivers who were ill and those with childrenwho were were severely ill at the time of data collection were excluded from the study.

2.5 DATA COLLECTION

Data collection was done through face-to-face interviews using a researcher administered structured questionnaire. All participants could read and understand English including the ones who had rceived primary education except for one participant who never went to school. The participants were given information about the study and written consent was obtained from them before commencing with the data collection. Each interview lasted for 30 minutes. The completed questionnaires were checked every day after data collection for completeness, clarity and consistency . All questionaires were completed and there were no incomplete questionaires or refusals.

2.6 DATA COLLECTION INSTRUMENT

The Questionnaire

The data collection instrument used in this study was based on a survey questionnaire used in Kgatleng district, in Botswana, in 2011 investigating a national diarrhoea outbreak which was adapted for demographic questions and modified for this study (AppendixA). Demographic section and questions on diarrhoea were selected.The pretesting of questionnaire was then conducted in 10% (8 participants) of questionnaires before data collection and alterations were made. The pretest was conducted in SSKB clinic which is not included in the clinics sampled for this study. Most of alterations were minor and involved rephrasing the questions.The questionnaire had four parts that contained information on socio-demographic characteristics, knowledge, attitude and practices on diarrhoea etiology, prevention and treatment in children. The sociodemographic characteristics of caregivers included age, gender, parity and level of education. The knowledge questions sought to gather information on the knowledge of caregivers on the definition of diarrhoea, common causes of diarrhoea in children under five years and prevention and treatment of diarrhoea. The attitude questions assessed the level of attitude of primary caregivers towards prevention and treatment of diarrhoea in children. A 3-point Likert scale was used to gather data on the care givers attitudes. For the practice questions, data related to management of diarrhoea was gathered and answers were scored based on WHO/UNICEF guidelines on management as a reference.

2.7 DATA ANALYSIS

The data were entered in Microsoft Excel 2013, cleaned, organised and transported to Epi Info version 7.0 for analysis. Keeping in mind of the study objectives, the descriptive and inferential statistics were used to analyze the data. In the study, knowledge of definition,causes, treatment of diarrhoea and prevention of diarrhoea, attitudes towards prevention and treatment of diarrhoea, practices on management, were considered to be the outcome variables and socio demographic characteristics such as age, gender, maternal educational status, and parity as exposure variables. The following are descriptions of data analysis per study objectives: (also summarized in table 1)

Objective 1: To describe socio- demographic characteristics of primary caregivers, the distribution of characteristics of respondents presented by age, gender, level of educational, parity and relationship with the child. Frequencies and percentages were calculated and presented in frequency tables and graphs.

Objective 2: To determine level of knowledge, attitude and practices among caregivers on prevention and treatment of diarrhoea. The knowledge variables were definition of diarrhoea, common causes of diarrhoea, prevention of diarrhoea, knowledge on the standard treatment of diarrhoea and preparation of ORS and SSS. The attitude key variables included perceptions on seriousness of diarrhoea, perceptions on prevention of diarrhoea by immunisation, perception on the effectiveness of ORT on treating diarrhoea and perceptions on the use of antidiarrheal and antibiotics for diarrhoea treatment. The practice key variables included presence of ORS at home, continuity of feeding during diarrheal episodes, health seeking and interventions and treatment strategies. Multiple responses were considered. The key variables were chosen as proxy and were scored. Each correct response was scored 1 and don't know was scored 0. The overall knowledge was determined by the mean score value.

Objective 3:To determine the association between socio-demographic variables with KAP outcome variables. Cross tabulations were made for bivariate variables. Chi square test was used to determine statistical significance at 5% level with 95% CI. Any variable with a p value less than 0.05 was considered significant. To identify independent predictors of childhood diarrhea management, variables that were statistically significant during bivariate test were entered into multiple logistic regression models to control the effect of confounders. $P \leq 0.05$ was considered statistically significant.

Objective 4:To determine the relationship between the KAP outcome variables. The relationship between knowledge, attitudes and practice variables was determined using chi-squire test of association. Any variable with a p- value less than 0.05 was considered significant. The summary of analysis for all objectives is illustrated in the table 1 below:

Table 1: SUMMARY OF ANALYSIS

Objectives	Key variables	Analysis
1. To describe sociodemographic characteristic of caregivers	• Age of the caregiver • Level of education • Gender of the caregiver • Parity	Descriptive analysis Univariate analysis -frequencies and percentages -means
2. To determine levels of knowledge, attitudes and practices among caregivers on prevention and treatment of diarrhoea.	• Knowledge of concept of diarrhoea • Knowledge of causes of diarrhoea • Knowledge of the preparation of ORS/SSS • Knowledge on prevention of diarrhoea • Attitude on treatment of diarrhoea with ORS • Practice on treatment of diarrhoea at home	Descriptive analysis Univariate analysis -frequencies and percentages - means
3. To determine the association between socio-demographic variables with KAP outcome variables	• Demographic variables and Knowledge level • Demographic variables and attitude level • Demographic variables practice level	Inferential bivariate analysis cross tabulation P value <0.05 Chi squire
4. To determine the relationship between the KAP outcome variables.	• Knowledge level and attitude level • Knooledge level and practice level • Attitude leve and practice level	P value Bivariate analysis using chi-squire test P value <0.05

2.8 ETHICAL CLEARANCE

Before commencement of the study, the research clearance was obtained from the University of Witwatersrand Ethics Committee clearance certificate number:**M160641** (appendix D**).**

Research permission was obtained from the Ministry of Health of Botswana Research Council (appendix B) and Great Gaborone District Health Management Team (DHMT)(appendix C) as well as from all three individual clinics.

CHAPTER THREE

3.0 RESULTS

This chapter presents the results of the study.

3.1 CAREGIVERS DEMOGRAPHIC CHARACTERISTICS

Table 2: CAREGIVERS DEMOGRAPHIC CHARACTERISTICS

Characteristics	Frequency (N=84)	Percentage
Age of the caregiver (Mean age 30,SD 8,38 years)		
18 - <28	38	45.25
28 - <38	36	42.86
38 - <48	5	5.95
Above 49	5	5.95
Gender		
Female	75	89.29
Male	9	10.71
Relationship to child		
Mother	64	76.19
Father	6	7.14
Grandparents	4	4.76
Other	10	11.90
Level of education		
None	1	1.19
Primary	6	7.14
Secondary	53	63.10
Tertiary	24	28.57
Parity		
None	7	8.33
One	38	45.24
Two	25	29.76
More than two	14	16.67

Table 2 above presents socio-demographic characteristics of the caregivers in the study. A total number of 84 caregivers participated in the study.Mean age was 30 years (SD=8.38). Most of caregivers 38(45%) and 36 (43%) had age ranges between 18 and 28 years and 28 and 38 years respectively; and very few were above 49 years5(6%). Most caregivers were

females 75(89.29%) and were biological mothers to the children 64 (76.19%).The majority of participants could read and write 83(99%). More than half of the participants had only one 38(45%) or two 25 (30%) children.

3.2 KNOWLEDGE, ATTITUDES AND PRACTICES OF CAREGIVERS REGARDING DIARRHOEA PREVENTION AND TREATMENT OF DIARRHOEA

Table 3: KNOWLEDGE ON DIARRHOEA PREVENTION AND TREATMENT

Variable	Frequency (N=84)	Percentage (%)
caregiver's knowledge of the concept of diarrhoea		
Definition of diarrhoea(multiple responses)		
Watery stool	79	94.5
Repeated vomiting	14	16.67
Stool with blood	5	5.95
Sunken fontanel	4	4.76
Other	2	2.38
Causes of diarrhoea(multiple responses)		
Lack of safe drinking water	47	55.95
Unhygienic disposal of human excreta and refuse	10	11.90
Eating contaminated food	57	67.86
Not washing hands after defecation	17	20.24
Unhygienic living environments	19	22.62
Not taking diarrhoea vaccines	0	0
Other	3	3.57
Treatment of diarrhoea(multiple responses)		
ORS fluids	71	84.52
Zinc	35	41.67
Take to the clinic	61	72.62
Knowledge on preparation of ORS	75	89.29
Knowledge on preparation of SSS	32	32.14
Prevention of diarrhoea(multiple responses)		
Routine immunisation	5	5.95
Wash hands when preparing meals	49	58.33
Boil drinking water	60	71.43
Other	8	9.5
Total given score	12	
Total mean score with SD	10.4 (Std Dev 1.24).	
Good knowledge(≥9)	32.14 (95%CI:22.36-43.22)(27 caregivers)	
Moderate knowledge(6-8)	67.86(95%CI:56.78-77.64)(57 caregivers)	
Poor knowledge(≤5)	Nil	

Knowledge regarding diarrhoea prevention and treatment

Table 3 above represents the knowledge of caregivers regarding prevention and treatment of diarrhoea. The total given score for correct responses was 12 points. The total mean score for responses was 10.4 (SD 1.24). Based on this knowledge, (26)32.14%had good knowledge and (58)67.86%had moderate knowledge.

Most of caregivers defined diarrhoea as frequent watery stool 79(94.5%). It is worth highlighting that only one fifth of the caregivers understood lack of washing hands after defecation as the cause of diarrhoea 17(20%) while none new about non vaccination as the potential cause of diarrhoea.

Most of the caregivers could treat diarrhoea with ORS fluids 71(84.52%) while less than half were aware about zinc as treatment of diarrhoea 35(41.67%).

Attitudes regarding diarrhoea, prevention and treatment

Table 4 on page 25 presents attitudes of caregivers towards prevention and treatment of diarrhoea. The total given score for attitude questions was 20. The mean score of respondents' attitudes was 14.33 (SD=3,178) with 36 (43%) having good attitudes towards the prevention and treatment of diarrhoea while 48 (57%) had poor attitudes. Most of the caregivers believe that diarrhoea is a serious condition in childhood and can cause death 82(97, 62%). Very few agreed that antibiotics should not be given to a child with diarrhoea unless there is blood in the stool 22(26.19%).

Table 4: ATTITUDES OF CAREGIVERS ON DIARRHOEA MANAGEMENT

Variable	**Agreed** Frequency (%)
Diarrhoea can cause death in children under five years of age	82(97.62)
Diarrhoea among children is usually caused by unclean environment	80(95.24)
Immunization prevents childhood diarrhoea	59(70.24)
Open defecation may lead to diarrhoea in young children	65(77.38)
We should wash hands thoroughly with soap after visiting the toilet, after changing the nappy, before handling food	82(97.62)
A child should be given ORS when vomiting repeatedly	50(59.52)
Anti-diarrheal medication should not be given to a child with diarrhoea	20(23.81)
Antibiotics should not be given to a child with diarrhoea unless there is blood in the stool	22(26.19)
Breast feeding during diarrhoea prevents dehydration and malnutrition	67(79.67)
Children should be taken to the health clinic when they have diarrhoea	80 (95. 24)
Total given score	20
Mean score with SD	14.33 (Std Dev 3.178).
Good attitude (≥14)	43(95%CI :39-46) (36 caregivers)
Poor attitudes(≤13)	57(95%CI: 53-60) (48 caregivers)

Practices regarding management of diarrhoea

Table 5 in page 27 presents practices of caregivers on management of diarrhoea. The total given score for practice questions was 10 points and mean score of participants was 6.02 (SD=1.6572). Based on this, 28.57% of caregivers had good practices and 71.45% had poor practices. It is worth to highlight that almost half of caregivers 44(52.38%) reported to have ORS at home but when their children had diarrhoea most of them 79(94%) gave ORS. Usage of Zinc tablet was reported by slightly more than half of the caregivers 50(59.52%). The use of sorghum soft porridge was common 53(63.09%) among caregivers during episode of diarrhoea and breastmilk was given by few11(13.10%) caregivers. Another significant finding was that almost all caregivers gave less food than usual during an episode of diarrhoea 78(92, 86%). Most of caregivers 66(78%) took the children to the clinic immediately where they realised that they have diarrhoea.

Table 5: PRACTICES ON MANAGEMENT OF DIARRHOEA

Variable	Frequency(n=84)	Percentage (%)
Presence of ORS at home	44	52.38
Used to treat diarrhoea(multiple responses)		
Fluid from ORS packet Government recommended home-made fluid	79	94
Zinc tablet	50	59.52
Other(rice water, sump water,)	2	2.38
Used to feed the child		
Breast milk only	11	13.10
Formula milk only	4	4.76
Sorghum soft porridge	53	63.09
Other/mixed	15	17.85
How much food was given		
Less than usual	78	92. 86
About the same	6	7.14
More than usual	-	-
Seek treatment from the clinic		
Yes	77	91.67
Duration taken before taking child to the clinic		
Immediately(0-3 days)	66	78
Delay(4-7 days)	19	22
Total given score for practice	10	
Mean score of practice with SD	*6,0238 (1,6572)*	
% good practice(≥7)	*28.57 (95%CL:19.24-39.47) (24 caregivers)*	
% poor practice(≤6)	*71.43(95%CL:60.53-80.76)(60 caregivers)*	

3.3 DEMOGRAPHIC CHARECTERISTICS ASSOCIATED WITH KAP

The caregivers characteristics were tested for evidence of statistical association with KAP using bivariate analysis. Variables were cross-tabulated with the level of knowledge, attitudes and practice to establish the association. Only variable with p-value <0.05 were considered significant at bivariate stage. Demographic charecterictis were indepenently associated with level of knowledge, attitudes and practices.Gender was significantly associatedwith level of

knowledge($p<0.001$) and level of practice($p= 0.04$) while level of caregivers education was significant with level of attitude. ($p= 0.015$). The results are presented in tables 6,7 and 8, below.

Table 6:DEMOGRAPHIC FACTORS ASSOCIATED WITH LEVEL OF KNOWLEDGE

Demographic variable	Knowledge level		Total	Chi-square value	Degrees of freedom	p-value
	Good n(%)	Moderate n(%)				
Age						
18-28	33(86.84)	5(13.16)	38	1.50	3	0.68
28-38	33(91.67)	3(8.33)	36			
38-48	4(80)	1(20)	5			
49-above	5(100)	0(0)	5			
Gender						
Female	71(94.7)	4(5.33)	75	16.26	1	0.001
Male	4(44.4)	5(55.6)	9			
Education						
None	1(100)	0	1	3.96	3	0.27
Primary	6(100)	0	6			
Secondary	49(92.45)	4(7.57)	53			
tertiary	19(79.16)	5(20.83)	24			
Parity						
None	6(85.72)	1(14.28)	7	3.71	3	0.30
One	36(94.73)	2(5.26)	38			
Two	20(80)	5(20)	25			
More than two	13(92.85)	1(7.14)	14			

Table 7: DEMOGRAPHIC CHARACTERISTICS ASSOCATED WITH ATTITUDES

Demographic variable	Attitude level		Total	Chi-Square value	Degrees of freedom	p-value
	Good n(%)	Poor n(%)				
Age						
18-28	25(65.7)	13(34.21)	38	0.67	3	0.88
28-38	26(72.22)	10(27.78)	36			
38-48	3(60)	2(40)	5			
49-above	3(60)	2(40)	5			
Gender						
Female	51(68)	24(32)	75	0.001	1	0.94
Male	6(66.67)	3(33.33)	9			
Education						
None	0	1(100)	1	10.48	3	0.015
Primary	4(66.67)	2(33.33)	4			
Secondary	31(58.49)	22(41.51)	53			
Tertiary	22(91.67)	2(8.33)	24			
Parity						
None	3(42.8)	4(57.14)	7	5.06	3	0.18
One	30(78.95)	8(21.05)	38			
Two	16(64.)	9(36.)	25			
More than two	8(57.86)	6(42.86)	14			

Table 8: DEMOGRAPHIC CHARACTERISTICS ASSOCIATED WITH PRACTICE

Demographic variable	Practice level		Total	Chi-Square value	Degrees of freedom	p-value
	Good n(%)	Poor n(%)				
Age						
18-28	8(21.5)	30(78.95)	38(100)	2.09	3	0.55
28-38	12(33.3)	24(66.67)	36(100)			
38-48	2(40.00)	3(60.00)	5			
49-above	2(40.00)	3(60.00)	5			
Gender						
Female	24(32.00)	51(68)	75(100)	4.03	1	0.04
Male	0	9(100)	9(100)			
Education						
None	0	1(100)	1	3.70	3	0.30
Primary	0	6(100)	6			
Secondary	18(33.96)	35(66)	53			
tertiary	6(25)	18(75)	24			
Parity						
None	1(14.29)	6(85.7)	7	2.36	3	0.50
One	11(28.29)	27(71.05)	38			
Two	6 (24)	19(76)	25			
More than two	6 (42.86)	8(57.14)	14			

3.4 RELATIONSHIP BETWEEN OUTCOME VARIABLES

Table 9: RELATIONSHIP BETWEEN OUTCOME VARIABLES

Variable	Practice level		Total	Chi square value	p-value
	Poor n(%)	**Good** n(%)			
Knowledge level					
Moderate	41(71.9)	16(29.62)	57	0.000	1.000
Good	19(70.37)	8(29.62)	27		
Attitude level					
Poor	33(68.75)	15(31.25)	48	0.15	0.70
Good	27(75)	9(25)	36		
	Attitude level				
	Poor	**Good**			
Knowledge level					
Moderate	34(59.64)	23(40.35)	57	0.19	0.66
Good	14(51.85)	13(48.14)	27		

The table 9 above represents the relationship between KAP variables. There was no statistical significant relationship found between KAP variables. Practice and knowledge (p-value close to 1), practice and attitude (p=0.70), attitude and knowledge (p=0.66).

CHAPTER FOUR

4.0 DISCUSSION

The present study aimed to determine the level of KAP in caregivers of children between 0- 5 years of age on childhood management of diarrhoea. The assessment was guided by the WHO/UNICEF IMCI guideline. Knowledge of the concept of diarrhoea, causes, treatment and prevention, attitudes towards diarrhoea and its management and practices by care givers on treatment and prevention were assessed.

Diarrhoea during childhood is prevalent and a common cause of morbidity and mortality among children below five years old (2). It presents with frequent loss stool and if not treated, dehydration follows and eventually the child dies. Prevention through proper WASH, feeding, immunisation and treatment with oral rehydration therapy and ZINC save life (1). The caregivers' knowledge of diarrhoea and its treatment with recommended interventions is critical to child survival and development. When caregivers recognise diarrhoea early they are able to start treatment early, thus preventing complications such as dehydration and malnutrition (14). It is therefore important for caregivers in Mogoditshane to have significant knowledge, good attitude and practice on diarrhoea and its management. To my knowledge, a study on knowledge, attitude and practices of caregivers has not been carried out in Mogoditshane.

4.1 THE KNOWLEDGE OF CAREGIVERS REGARDING DIARRHOEA, PREVENTION AND TREATMENT

The study found that most caregivers (68%) had moderate knowledge of diarrhoea, prevention and treatment while just a few (32%) had good knowledge. The findings were consistent with other studies (41, 47, 49).The majority of participants in the study conducted in Bangura had moderate knowledge (66%) (47). Few care caregivers in Iran and Nigeria only 28 and 39 percent had good knowledge of diarrhoea respectively (41). Sixty-three percent had good knowledge (45).

The treatment of choice for acute diarrhoea due to rotavirus is ORS and zinc; however a wide variation in the level of awareness was detected in this study. Many caregivers knew that they should give ORS while very few mentioned Zinc. It was expected that caregivers know both

proportionately. These clearly highlight low levels of awareness among study participants on zinc in its treatment of diarrhoea as compared to ORS. These could be because zinc is new in the intervention package in Botswana and raising awareness of needs to be intensified. Although there was high level of awareness of SSS among caregivers in the study, participants could not correctly describe the preparation. This was also observed in other studies (16).The reason behind could be that ORS has replaced the homemade solution and the ministry of health has decided to phase it out since caregivers are not preparing it well and results in increased number of diarrhoea. Moreover, almost all caregivers knew ORS, nonetheless they knew less about how to prepare it and few had ORS available in this study. This was disappointing because high availability of ORS was expected due to the fact that it is scaled up nationally. Similarly, Choube (44) found that only few participants in their study had ORS available at home in India.

The study confirms the findings from previous study on WASH, which found out that unhygienic disposal of human excreta, unhygienic living environments and not washing hands after defecation had received insufficient attention by caregivers despite it proven to a leading cause of diarrhoea (19). Of all risk factors/causes only unclean water drew the attention of the caregivers while the latter were ignored. This could be due to insufficient educational messages given to the community by health workers.

Caregivers in the study did not know that when children are not vaccinated they are at risk of contracting diarrhoea. Only 5% of caregivers in the study knew that routine immunisation prevents diarrhoea, despite immunisation coverage being high in Botswana. To maintain this satisfactory coverage, ongoing caregiver's education should be emphasised.

4.2 ATTITUDES REGARDING DIARRHOEA, PREVENTION AND TREAMENT

Attitude have strong influence on diarrhoea management practices. However, the current study found that only 43 percent of caregivers had favorable attitudes towards diarrhoea and its management. The findings are not satisfactory and have the potential to alter the practice on management of diarrhoea. The results could be due to the level of education of caregivers. The findings of the study are consistent with studies in Ethiopia where only 50.1% of the mothers had favorable attitude for diarrhoea management (46). On the other hand, studies

done by Gazi et al (47) and Masiha et al (50) in Pakistani found positive attitude towards management of diarrhoea. Seventy-six percent of caregivers had favorable attitudes towards diarrhoea and its management (47). Attitudes have a strong influence in practices therefore it is critical that caregivers have good attitudes to perform better practice of diarrhoea management for child survival.

Although the general attitude was poor in this study, most of the caregivers (94%) perceived diarrhoea as a serious childhood condition that may result in loss of life and 89% agreed that when children have diarrhoea they should be taken to the clinic. This translates to good care seeking.

On the use over the counter medication, the study found that very few held the view that the use of antibiotic and antidiarrheal medication to treat acute diarrhoea is irrational. Similarly, several studies reported the use of drugs to treat diarrhoea in children under five (51-52). The most commonly reported measures were the use of an antibiotic and an antidiarrhoeal.This evidently shows that participants still have faith on antibiotics for treatment of acute diarrhoea. Perceptions on diarrhoea may delay initiation of recommended treatment, it is therefore important to be culturally sensitive when designing intervention programmes to improve attitudes. Health education must be tailored to a target community.

4.3 PRACTICES REGARDING MANAGEMENT OF DIARRHOEA

Practices of caregivers on case management of diarrhoea were very poor in this study. The study found that only 28 percent of caregivers had good practice on diarrhoea management. These findings were lower but better than findings by Gazi et al (47), where, only 9.3% of mothers performed good practices on management of diarrhoea. Similarly, the prevalence of good diarrhoea management was low in 11 of the 12 analysed surveys, varying from 17 % in Cote d'Ivoire to 38 % in Niger (52).

Fifty two percent of caregivers in the study reported to have at least a packet of ORS at home. The numbers are significantly low given that, caregivers are given ORS and zinc on every monthly visit to the clinic for routine immunisation and growth monitoring. The availability of ORS at home has not significantly improved since 2012 (53). These findings may mean that due to increased incidence of diarrhoea caregivers use ORS for treatment of dehydration as recommended. The study shows that 94 percent used ORS for their children during

diarrhoea episodes. Although the study did not explore the reason for not having ORS at home, which would have given a better insight, and how it is given, the study suggests that, the low availability was due to increased usage by the caregiver during frequent episodes of diarrhoea. This may also show that the government's programme on distribution of ORS is not very effective. However, the availability and usage of ORS was high compared to what was found by Osonwa et al (37), in Nigeria where only 10% of caregivers had ORS at home and 45 percent used it.

This study did not explicitly address the prevalence of breastfeeding among young children, however few breastfed during the diarrhoea episodes. Only 11 percent breastfed while 63 percent of caregivers gave soft porridge only. Not surprisingly, it seemed to be a custom to feed children with sorghum soft porridge only, during the diarrhoea episodes. Giving sorghum only could place the diarrhoeal child to protein deficiency malnutrition. Considering this, it shows that breast milk was not a priority for caregivers during diarrhoea episodes. This ignorance may be due to the belief that sorghum gives the child energy and fear that giving breast milk will expose the child to HIV, since there is high prevalence of the virus among pregnant women in Botswana.

It is recommended that caregivers increase feeds during the episodes of diarrhoea, however in this study, none of the caregivers gave more feeds than usual while almost all gave less than usual. Only 92 % of caregivers gave less food than normal to their children when they had diarrhoea. These can worsen the effects of diarrhoea. Masood et al (54) also found that many caregivers (60%) continued to give less food during diarrhoeal episode.

The practice on care seeking was good as most of caregivers took the children to the health facility immediately on recognising diarrhoeal episodes. Dehydration could be related to poor adherence of treatment prescribed, when they get home. These are supported by a study in Zambia where caregivers reported that children refuse to drink ORS due to its palatability (35).

4.4 THE ASSOCIATION BETWEEN DEMOGRAHIC CHARACTERISTICS AND KAP REGARDING MANAGEMENT OF DIARRHOEA

In this study, gender of the caregiver and level of education were significantly associated with level of KAP on diarrhoea management at bivariate analysis. The level of education was found to be significantly associated with the level of attitudes on diarrhoea and its management. The association was also found in a study in Nigeria (55). In contrast, maternal literacy did not influence the level of KAP in one study (45). Furthermore, the latter study found age to be an important factor in the level of KAP practices (36), which was not the case in this study. When programmes are developed and implemented gender and caregiver's education should be considered. This study was small and very few males participated, a large scale study is therefore recommended.

4.5 THE ASSOCIATION BETWEEN KAP OUTCOMES REGARDING MANAGEMENT OF DIARRHOEA

This study did not find a statistical significant association between KAP outcomes. Similarly, Mathiazhakan et al did not find statistical significant association between KAP outcomes (56). Contrary, Zafar (57) found a strong relationship between KAP outcome variables (OR 3.92 95%CI 2.71-8.94).

4.6 LIMITATIONS

The limitations of the study are acknowleged. Selecting caregivers from a facility was a limitation as it ignored the caregivers from communities who have not accessed facilities and therefore may differ in KAP as they were not exposed to health promotion education. Another was the limited time to reach partipants which was difficult.Given that , convenience sampling technique was used, participants did not have equal chances of being included in the study. This may have introduced sampling bias and affected the generalisability of the fidings of this study.

4.7 RECOMMENDATIONS

Scaling up of caregivers health education

The overall KAP of the caregivers was not satisfactory in this study. Improving caregivers' KAP through health education can significantly results in better performance in prevention and treatment of childhood diarrhoea (58, 59). Ongoing health education, provided by volunteers has improved knowledge of diarrhoea among caregivers in Sudan (58). Finding strategies to strengthen communications, such as mass media and active involvement of civil society will result in improved attitudes of caregivers (59). Considering time and target during planning will also improve the quality of health education (49). Baby sitters should be educated since they are the people who spend long hours with children while their mothers are at work. Harnagle et al (60) opined that health education on child health must be incorporated in the ANC programmes. The mother should be taught about child care at pregnancy or even before conception. Caregivers are more likely to use zinc when they have been exposed to messages about it and know where to get it. Post-test knowledge scores were higher after message exposure, which demonstrated the effectiveness of health education (14, 61). Mothers in the health education intervention group were 1.82 (95% CI 1.17, 2.85) times more likely to use ORS to treat their child's diarrhoea episode than mothers in the comparison group (38). Meta-analysis of ORS social marketing and mass media strategies indicates that mothers exposed to messages were 2.05 (95% CI, 0.78, 5.42) times more likely to use ORS to treat their child's diarrhoea episode than unexposed mothers (38).

On the basis of KAP scores in this study, health education campaigns and programmes need to disseminate specific messages including optimal feeding during diarrhoea, use of zinc, discouraging use of antibiotics and anti-diarrhoeals and about importance of hand washing and clean environment.

Scaling up of availabilty of ORS and Zinc

Oral rehydration solution was not adequately available at households of the study participants. Scaling up of the availability of ORS and Zinc at home through the use of community health care workers, active involvement of key stakeholders and addressing supply and demand of ORS could improve its awarenes and availability at home (42,58). Furthermore, addressing therisk factors should be prioritized and incorporating existing perceptions might lead to

positive changes (58,62). Health promotion activities, such as ORS outreach education campaignshavethe potential to increase availability of theseessential commodities. Promotional activities were associated with improved KAP at the end line with respect to the use of ORS and Zinc (63). Providing opportunities for caregivers to receive a sample of zinc and ORS has the potential to increase availabity of important commodities as it will reach those that are normally hard to reach.

Based on the findings from study, it is recommended that public health interventions are needed both at a community as well as facility level. Community child health programmes in Botswana including IMCI need to specifically target caregivers regarding health education on diarrhoea management, home management, early detection of danger signs and timely care seeking. At a facility level, health workers need to ensure that no opportunity is lost to educate caregivers coming for well and sick child care services, on diarrhoea prevention and management.

4.8 CONCLUSSION

Diarrhoea continues to plague on Botswana's children,resulting in high mortality rates among children below five years old. Efficient and cost effective interventions have been implemented and have shown desirables outcomes. Despite the eveidence, this study found low level of KAP amomong caregivers on management of diarrrhoea at home. Caregivers, were reluctant to give ORS and zinc during diarrhoea episodes. Nutrition is key especially during episodes of diarrhoea, however in this study caregivers gave less food than normal.

The study found inadequate KAP which was significantly associated with gender and level of education.The attitude towards management of diarrhoea was poor. Unlike in others studies, this study did not find significant relationship between knowledge, attitudes and practice variables.

Health education and behavoural change communication to improve attitudes and scaling up of ORS/ZINC in these communities is needed. Exisiting public health programmes on child health need to be evaluated in order to highlight gaps in implementation. Health education interventions should consider perceptions and belief of the caregivers.

APPENDICES

APPENDIX A: QUESTIONNAIRE

ID: A____, B___, C___

Title of the study: Knowledge, Attitude and Practices (KAP) of caregivers on prevention and treatment of childhood diarrhoea among children aged between 0 to 5 years attending child welfare clinics (CWC) in Mogoditshane village, Botswana

SECTION A: SOCIO DEMOGRAPHC QUESTIONS

Q.NO	Questions	Response category	code	Instruction
A1	Age of the caregiver			
A2	Gender of the caregiver	Female.....1 Male 2		
A3	What is your relationship to this child? **If other specify** _____	Mother.....1 Father.....2 Grandparents.....3 Other.....4		
A4	What is the highest level of education did you achieve?	None.....1 Primary.....2 Secondary.....3 Tertiary.....4		
A5	How many children do you have (parity)	None .....1 One .....2 Two .....3 More than two.....4		

1

ID: A____, B___, C___

Title of the study: Knowledge, Attitude and Practices (KAP) of caregivers on prevention and treatment of childhood diarrhoea among children aged between 0 to 5 years attending child welfare clinics (CWC) in Mogoditshane village, Botswana

SECTION B: KNOWLEDE ON PREVENTION AND TREATMENT OF DIARRHOEA

Q.NO	Questions	Response categories	Code	Instruction
B1	What do you understand by childhood diarrhoea? **(multiple response allowed)**	Passing watery stool more than 3 times a day.....1 Repeated vomiting.....2 Passing stool with blood.....3 Sunken fontanel.....4 Other_____...5 specify Do not know.....6		
B2	What are the common causes of diarrhoea?	Lack of safe drinking water.....1 Unhygienic disposal of human excreta and refuse.....2 Eating contaminated food...3 Not washing hands after defecation.....4 Unhygienic living environment.....5 Not taking diarrhoea vaccines.....6 Other.....7 Do not know.....8		
B3	If your child had diarrhoea, what would you do?	--- ---		
B4	How do you prevent childhood diarrhoea among your children?	Routine immunisation.....1 Wash hands when preparing their meals.....2 Boil their drinking water.....3 Other_____ ..... 4 Specify		

ID A_B_C_

SECTION C: ATTITUDE TOWARDS DIARRHOEA, HEALTHCARE SEEKING, PREVETION AND TREATMENT

Check on whether you agree, do not know or disagree below

Q.NO	Questions	Agree	Do not know	disagree
C1	Diarrhoea can cause death in children under five years of age			
C2	Diarrhoea among children is usually caused by rota virus			
C3	Rota virus vaccine prevents diarrhoea due to rota virus and is safe			
C4	Open defecation may lead to diarrhoea			
C5	We should wash hands thoroughly with soap after visiting the toilet, after changing the nappy, before handling food			
C6	A child should be given ORS when vomiting			
C7	Anti-diarrheal medication should not be given to a child with acute diarrhoea			
C8	Antibiotics should not be given to a child with diarrhoea unless there is blood in the stool			
C9	Breast feeding prevents dehydration and malnutrition			
C10	Children should be taken to the health clinic when they have			

ID: A____, B___, C___

Title of the study: Knowledge, Attitude and Practices (KAP) of caregivers on prevention and treatment of childhood diarrhoea among children aged between 0 to 5 years attending child welfare clinics (CWC) in Mogoditshane village, Botswana

Section D: PRACTICES ON DIRRHOEA CASE MANAGEMENT (to assess how caregivers managed the last episode of their child's diarrhoea)

NB! Do not prompt or mention any response!

NO	Questions	Response categories	Code	Instruction
D1	Do you have a packet of ORS at home?	Yes……1 No……2		
D2	When the child had diarrhoea, what was given to treat the diarrhoea? **(multiple responses allowed)**	Fluid from ORS packet Government recommended home-made fluid ..... ……1 Zinc tablet…...……..2 Home remedy/Herbal medicine……3 Antibiotics from the chemist……4 Anti-diarrhoeal from the chemist-------5 Other_____……6 Specify Nothing……..7		
D3	When the child had diarrhoea, what was the child fed on?	_____ _____		
D4	How much food was given to the child?	Less than usual . . . . . 1 About the same…….. . . . . 2 More than usual . . . . . 3 Stopped food . . . . . 4 Never gave food . . . . . 5 Don't know 6		
D5	Did you seek treatment for the diarrhoea from the clinic?	Yes……..1 No ……2		if yes go to d6, if no End
D6	After how many hours/ days, did you go to the clinic when the child had diarrhoea?			

We have come to the end of the interview. Thank you for your time and participation!

APPENDIX B: MOHW PERMISSION TO CONDUCT RESEARCH

TELEPHONE: 363 2766
FAX: 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

Republic of Botswana

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: HPDME 13/18/1 X (516) **19 May 2016**

Health Research and Development Division

Notification of IRB Review: **New application**

Ms Gofaone Jessica Mosweu
P O Box 445BCR
Mogoditshane
Botswana

Protocol Title: KNOWLEDGE, ATTITUDE AND PRACTICES OF PRIMARY CAREGIVERS ON MANAGEMENT OF CHILDHOOD DIARRHEA AMONG CHILDREN AGED BETWEEN 0-5 YEARS ATTENDING CLINICS IN MOGODITSHANE VILLAGE BOTSWANA

HRU Approval Date:	19 May 2016
HRU Expiration Date:	18 May 2017
HRU Review Type:	HRU reviewed
HRU Review Determination:	Approved
Risk Determination:	Minimal risk

Dear Ms Mosweu

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

Continuing Review
In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form

Amendments
During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: www.moh.gov.bw or can be requested via e- mail from Mr. Kgomotso Motlhanka, e-mail address: kgmotlhanka@gov.bw . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting
Other events which must be reported promptly in writing to the HRDC include:
- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632754. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully

P. Khulumani
For /Permanent Secretary

MINISTRY OF HEALTH RESEARCH DIVISION
2016 -05- 19
GABORONE
REPUBLIC OF BOTSWANA

APPENDIX C: GGDHMT PERMISSION TO CONDUCT STUDY

TELEPHONE: (267) 3904451
FAX : (267) 3188012
REFERENCE : DHMT

REPUBLIC OF BOTSWANA

Gaborone District Health Management
PRIVATE BAG RW 004
GABORONE
BOTSWANA

Ref:GGDHMT 2/27 I

9th June, 2016

Ms. Gofaone Jessica Mosweu
PO Box 445BCR
Mogoditshane

Dear Madam,

RE: PERMISSION TO CONDUCT STUDY IN GREATER GABORONE DHMT PUBLIC CLINICS

This serves to let you know that permission is granted to conduct a study as approved by Health Research and Development Division of Ministry of Health on **"Attitudes and Practices of caregivers on prevention and treatment of childhood diarrhea among children between 0 to 5 years attending child welfare clinics in Mogoditshane village, Botswana".**

This permits you to go into the health facility but you need to ask respondents for their participation. It should also not disturb patient care in any manner during the course of the visit.

The facilities allocated are Mogoditshane, Nkoyaphiri and Lesirane clinics.

By copy of this letter officers In-charges of all Health facilities are informed of your intentions and are requested to allow you access and support.

Yours faithfully,

Dr. G. M. Simoonga
Coordinator DHMT

APPENDIX D: RESEARCH CLEARANCE

R14/49 Miss Gofaone Jessica Mosweu

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M160641

NAME: (Principal Investigator)	Miss Gofaone Jessica Mosweu
DEPARTMENT:	Community Paediatrics Lesirane Clinic, Botswana
PROJECT TITLE:	Knowledge, Attitudes and Practices (KAP) of Caregivers on Prevention and Treatment of Childhood Diarrhoea Among Children Aged between 0 to 5 Years Attending Child Welfare Clinic (CWC) in Mogoditshane Village, Botswana
DATE CONSIDERED:	24/06/2016
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Prof Tobias Chirwa and Dr Himani Pandya
APPROVED BY:	Professor P. Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	25/07/2016

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004,10th floor, Senate House/2nd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/We fully understand the the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated,from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. in this case, the study was initially review in June and will therefore be due in the month June each year.

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

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