SCHOOL OF NURSING, COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA, LEGON

PRE-HOSPITAL MANAGEMENT OF DIARRHOEA AMONG CAREGIVERS WITH CHILDREN UNDER FIVE AT PRINCESS MARIE LOUISE CHILDREN HOSPITAL, ACCRA

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DECLARATION

I declare that, with the exception of references made to other people's work which have been acknowledged, this thesis is as a result of my own effort. No material in this write up has been submitted for any other degree, neither has it been submitted concurrently in candidature for any other degree or certificate.

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DEDICATION

To my husband, Mr. Martin Ankomah and my two dear children, Lois Adoma Ankomah and David Opoku Ankomah.

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I am most grateful to the Almighty God, who gave me the knowledge, good health and favour to finish this script.

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LIST OF ABBREVIATIONS

CDD	Control of Diarrhoeal Disease
CHPS	Community Health Planning Services
EPI	Expanded Programme on Immunisation
GAVI	Global Alliance for Vaccines and Immunization
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service
HIV	Human Immunodeficiency Virus
IMNCI	Integrated Management of Neonatal and Childhood Illnesses
JHS	Junior High School
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
NHIS	National Health Insurance Scheme
NHIA	National Health Insurance Authority
OPD	Out-patient Department
ORS	Oral Rehydration Salt
ORT	Oral Rehydration Therapy
PML	Princess Marie Louise
RHFs	Recommended Home Fluids
SHS	Senior High School
SPSS	Statistical Product and Service Solutions
SSS	Sugar Salt Solution

SSW	Sugar-Salt- Water
UNICEF	United Nations International Children Education Fund
WHO	World Health Organisation

ABSTRACT

The study sought to assess pre-hospital management of diarrhoea and factors affecting it among caregivers with children under five at the PML Children Hospital in the Greater Accra Region. Diarrhoea remains one of the leading causes of morbidity and mortality among children under five at PML Children Hospital despite the undeniable success of interventions such as ORT, appropriate drug therapy, optimal breastfeeding practices over the years. Proper home management can reduce morbidity and mortality due to diarrhoea. The study design was cross-sectional adopting quantitative approach. The study population comprised all caregivers with children under five reporting to PML Hospital with diarrhoea. A total of 120 participants were enrolled into the study. Permission was sought from PML Children Hospital Management where the study was conducted by providing permission letters and ethical clearance. A structured questionnaire was used as a data collection tool for the study. Data collected was analysed using SPSS version16.0. The findings of the study show poor home management of diarrhoea including dietary restrictions during the diarrhoea episode, low use of both RHFs and ORS but high use of other remedies such as antibiotics and anti-diarrhoea to treat diarrhoea. The study also reveals that caregivers' educational level had no relationship with knowledge about danger signs of diarrhoea, correct use of ORS as well as level of awareness and use of RHFs and ORS. However, a convincing evidence of relationship was established between caregivers' education and knowledge about causes of diarrhoea as well as health insurance cover and duration of diarrhoea illness before hospital visit. The study recommended a step up in health education programmes on pre-hospital management of diarrhoea nationwide. A major limitation of the study is that it was limited only to PML Children Hospital and therefore the outcome cannot be generalized to the entire country.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Child health remains a national priority in Ghana and several programmes and interventions are being put in place at all levels as part of the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) to address challenges confronting child survival in the country. The Ghana Demographic and Health Survey (GDHS, 2008) has given strong indication that Ghana has since the turn of 21st century made significant progress in improving the health of children. The survey indicates that child mortality figures have significantly decreased by about 28% after years of remaining stagnant. Infant mortality has declined from 66 deaths per 1,000 live births in 2003 to 50 deaths per 1,000 live births in 2008. Over the same period, under-5 mortality also declined substantially from 111 deaths per 1,000 live births in 2003 to 80 deaths per 1,000 in 2008.

Despite this progress of significant reduction in both infant and under-five mortality rates, there are still several challenges to be addressed in order to accelerate the attainment of the 2015 target of the United Nations Millennium Development Goal (MDG) number 4, namely to reduce the mortality rate among children under five by two-third. The major challenges include the need to improve case management skill of health workers, strengthen the health system and address family and community practices that impact on the health of the child. One key strategy in response to the afore-mentioned challenges, as outlined in the revised national Under-5 Child Health Policy and Strategy (2007-2015) of Ministry of Health (MOH), Ghana, is scaling up and sustaining interventions for prevention and proper home management of diarrhoea, which remains one of the leading causes of death among children in Ghana.

Diarrhoea is a common disorder of the gastrointestinal system experienced by most of the population sometime in their lives. According to World Health Organisation (WHO, 2009), diarrhoea is usually a symptom of an infection in the intestinal tract, which is caused by infectious organisms, including viruses, bacteria, protozoa, and helminths. The infection is spread through contaminated food or drinking-water, or from person-to-person as a result of poor hygiene.

Globally, diarrhoeal diseases remain a leading cause of death among children under five. Boschi-Pinto, Velebit and Shibuya (2008) estimate global deaths from diarrhoea of children aged less than 5 years at 1.87 million each year, accounting for approximately 19% of total childhood deaths. They further estimate that African and South-East Asian Regions combined contain 78% (1.46 million) of all diarrhoea deaths occurring among children in the developing world. The routine data from health facilities in Ghana also indicate that over 500,000 diarrhoeal cases are registered annually accounting for 5% of registered Out-Patient Department (OPD) cases, of which 33% are in children below 5 years of age (MOH, 2010).

Proper home management can reduce morbidity and mortality due to diarrhoea. Factors of particular importance include caregivers' knowledge about causes of diarrhoea and the associated dangers signs, prevention of dehydration during diarrhoeal episodes through the use of Recommended Home Fluids (RHFs) and Oral Rehydration Salts (ORS), support of nutritional status through the continuation of an adequate diet, avoidance of harmful practices and early referrals for treatment.

Available statistics indicate that since 1978, when the WHO and the United Nations International Children Education Fund (WHO & UNICEF, 2001) adopted Oral Rehydration Therapy (ORT) using ORS solution as the primary tool to fight dehydration, the mortality rate

for children under the age of five suffering from acute diarrhoea has fallen from 4.5 million to 1.8 million deaths annually. Preventive strategies such as breastfeeding, improving complementary feeding, zinc supplementation and increasing coverage with the full set of Expanded Programme of Immunization (EPI) vaccines (especially measles and rotavirus vaccines) have also been proven to be useful and effective (GAVI, 2005).

Even though the potentials of the afore-mentioned interventions to manage and further drive down diarrhoea mortality have been well acknowledged, the challenge has been to achieve high coverage of the interventions particularly good practice with ORT and correct diarrhoea case management including nutrition interventions at home. The MDG 4 will be easier to attain if proper interventions including appropriate use of ORS and other RHFs are adopted at home to prevent and manage diarrhoea among children under five.

1.2 Statement of the problem

Diarrhoea is one of the leading causes of morbidity and preventable death, especially among children under five in Ghana (MOH, 2010). At the Princess Marie Louise (PML) Children Hospital in the Greater Accra Region, diarrhoea, as demonstrated in Table 1.1, remains one of the 10 commonly ranked diseases of occurrence for OPD attendance, admission and death in the hospital. From the Table, the trend in the number and rank of diarrhoea diseases among the top 10 causes of OPD attendance, admissions and deaths at the hospital has been increasing over the last five years. It is believed that significant reduction in diarrhoea morbidity and mortality in the hospital can be achieved if caregivers have insight in the causes, prevention and pre-hospital management care of the disease.

Table 1.1: Trend in diarrhoea cases at PML Children Hospital: 2007 - 2011

Year	Number of OPD diarrhoea cases	Number of In-patient diarrhoea cases	Number of deaths	Rank of diarrhoea among top10 causes of Admission	Rank of diarrhoea among top 10 causes of OPD morbidity
2007	5112	427	2	3rd	3rd
2008	6189	520	7	2nd	4th
2009	5330	616	12	2nd	3rd
2010	1089*	777	13	2nd	4th
2011	8621	1132	16	2nd	3rd

Source: PML Children Hospital, Medical Records Department, December, 2012
*(The drop in the OPD attendance in the year 2010 was due to nationwide strike action by the Ghana Medical Association)

Some concerns, however, remain that some caregivers are not well informed about the risk factors and prevention of diarrhoea, its home management, good feeding practices and seeking of early medical attention. Experience has shown that most diarrhoea cases, which are presented for treatment at the hospital, are poorly managed at home. The general perception is that most of the caregivers who lack knowledge in the causes and the associated dangers signs of diarrhoea as well as diarrhoeal management practices such as correct use of ORS have low level of education.

Another important concern is that some of the caregivers do not take their children early to the hospital for treatment. Available records at the emergency unit of the PML Children Hospital indicate that most of the children reported with diarrhoea at the hospital had severe dehydration. Some of them try several open prescription drugs before taking their children to the hospital. The attendant effect is that the already over-stretched health workers spend several hours and energy to resuscitate the children who are usually in shock or severely dehydrated and in some cases, some of the affected children lose their lives thereby contributing to the high

child mortality rate in Ghana. It is believed that some of the caregivers are unable to send their children to the hospital early enough due to financial constraint.

In this context, a study of pre-hospital management of diarrhoea among caregivers with children under five is critical to ascertain and understand factors affecting home management of diarrhoea and how these factors can be addressed to reduce diarrhoea morbidity and mortality among children under five. Towards this end, the researcher seeks to ask the following questions to generate relevant information to help improve upon diarrhoea management practices at home:

i. Is there a relationship between caregivers' level of education and knowledge about causes and danger signs of diarrhoea?
ii. Does the quantity of fluid and food intake by children change during diarrhoea episode?
iii. Is there a relationship between caregivers' level of education and awareness and use of ORS and RHFs for home management of diarrhoea? Again, is there a relationship between caregivers' education and correct use of ORS?
iv. What other mode of treatment do caregivers use at home for managing children with diarrhoea before seeking care at a health facility?
v. Is there a relationship between caregivers' ability to pay and duration of diarrhoea illness at home before seeking treatment at a health care facility?

1.3 Purpose of study

The purpose of the study is to assess pre-hospital management of diarrhoea and factors affecting it among care givers with children under five at the PML Children Hospital.

1.4 Objectives of study

i. To determine caregivers' understanding about diarrhoea, its causes and the associated danger signs.
ii. To examine the feeding practice among caregivers during the diarrhoeal episode.
iii. To examine the level of awareness and use of ORS and RHFs for home management of diarrhoea.
iv. To identify other mode of treatment, which caregivers give during diarrhoeal episode.
v. To investigate factors that influence caregivers' decision to seek health care.

1.5 Significance of study

Knowledge, attitudes and practices of caregivers (mothers) are important determinants of the occurrence or outcome of diarrhoea among children under five. The findings of the study are expected to contribute to the understanding of the levels of knowledge, attitudes and practices of caregivers of children under five with diarrhoea. This will help in developing improved process of awareness creation that will inform a strong basis for effective behaviour change communication as part of the national strategy to reduce diarrhoea child morbidity and mortality in Ghana.

In the academic realm, the study will provide insight into diarrhoea and its home management practices among caregivers. This will help in developing tailored made training programmes for health students and service providers to transmit priority messages on home-based management of diarrhoea.

1.6 Statement of hypothesis

The following hypotheses were drawn and tested:

i. There is no relationship between caregivers' educational level and knowledge about the causes and danger signs of diarrhoea;
ii. There is no relationship between caregivers' educational level and the use of ORS and RHFs;
iii. There is no relationship between caregivers' educational level and the use of ORS; and
iv. There is no relationship between caregivers' ability to pay and duration of diarrhoea illness at home before seeking treatment at a health care facility

1.7 Operational definitions

Diarrhoea: Passing frequent, loose, watery stools three or more times in a day with or without other signs and symptoms. In an exclusive breastfed baby, diarrhoea is increase in stool frequency or liquidity that is considered abnormal for the mother.

Caregiver: Anybody who actively takes part in taking care of a child at home.

Pre-hospital management: The type of care caregivers give to the children themselves at home during diarrhoeal episode before accessing health care at the hospital.

Care seeking behaviour: Health service use behaviour, that is, the waiting time at home before accessing health care.

Other mode of treatment: Any form of treatment or drug used in home management of diarrhoea apart from ORS or RHFs.

Dehydration: Loss of water and dissolved salts from the body, occurring, for instance, as a result of diarrhoea

Rehydration: The correction of dehydration

Oral Rehydration Therapy (ORT): The administration of recommended fluid by mouth to prevent or correct dehydration (as a result of diarrhoea) in addition to continuous feeding.

Oral Rehydration Salt (ORS) Solution: Specifically, the complete, new WHO/UNICEF formula.

Recommended Home Fluids (RFHs): Recommended homemade fluids for home management of diarrhoea

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature intended to provide a deeper understanding of the background to the study and the research questions and lay the foundation for the study. The literature was sought from science direct, HINARI, JSTOR, MEDLINE, Pub med, CINAHL and Google scholar as well as other relevant nursing journal. The review was organised under the following themes: definition and types of diarrhoea, knowledge about causes and danger signs of diarrhoea, feeding practices among caregivers during episode, awareness and use of ORS and RHFs, other mode of treatment for diarrhoea, factors influencing caregiver's decision to seek health care during diarrhoea episode and ssummary and conclusion drawn from the literature.

2.2 Definition and types of diarrhoea

Diarrhoea is a common digestive disorder that all people will suffer at some stage during their lives. By convention, diarrhoea is present when three or more stools are passed in 24 hours that are sufficiently liquid to take the shape of the container in which they are placed (Black & Lanata, 2002). The MOH's Standard Treatment Guidelines (2004) defines diarrhoea as passing frequent, loose, watery stools three or more times in a day. However, in an exclusively breastfed baby, diarrhoea is defined as an increase in stool frequency or liquidity that is considered abnormal by the mother. This is because an exclusively breastfed baby normally passes several soft, semi- liquid stools each day.

Diarrhoea is caused by infectious organisms, including viruses, bacteria, protozoa, and helminths, which are transmitted from the stool of one individual to the mouth of another, termed as fecal-oral transmission. Other causes of diarrhoea include food and water contamination, malnutrition, dietary changes, medication and physiological stress. Diarrhoea is very common in children. Severe diarrhoea leads to fluid loss, and may be life-threatening particularly in young children, infants who are not exclusively breast fed and adults who are malnourished or have impaired immunity (WHO, 2009)

According to Keusch et al. (2006), there are three major types of diarrhoea. These are: acute watery, persistent, and bloody. Acute watery diarrhoea is the type that most likely leads to rapid dehydration. This form is the most deadly in young children and is commonly associated with rotavirus, enterotoxigenic E.coli, or V. cholerae (cholera). Persistent diarrhoea is less common form and is typically connected with malnutrition and is disproportionally associated with an increased risk of death. Bloody diarrhoea is often related to malnutrition, intestinal damage, or secondary sepsis. It is often associated with dysentery

2.3 Knowledge about causes and danger signs of diarrhoea

Mothers or caregivers at home should have adequate knowledge about the causes and the associated danger signs of diarrhoea in children. According to Othero, Orago, Groenewegen, Kaseje, and Otengah (2008), knowledge of mothers regarding causes of diarrhoea and its associated danger signs in children is a guideline to timely and proper management at home and subsequent referral for skilled care. They further indicate that knowledge of danger signs of diarrhoea is imperative because it leads to early referral of very sick children and that failure to refer such children results in major complication or deaths.

There is an extensive body of literature focusing on mothers' knowledge about childhood diarrhoea and its associated danger signs. The evidence from the literature, however, shows that mothers/caregivers have diverse perceptions on causes of diarrhoea and poor knowledge about the danger signs of diarrhoea. A household longitudinal study by Othero et al. (2008) in Kenya in 2004-2006 shows that more than half (55.6%) of the caregivers attributed the cause of diarrhoea to unclean water. Other reasons assigned to the causes of diarrhoea were contaminated food (54.9%), bad eye (50.0%), false teeth (45.6%) and breast milk (35.8%).

The study further revealed that most of the mothers (76.4%) were not able to mention any of these danger signs associated with diarrhoea such as excessive thirst, sunken eyes and fontanel, skin pinch returning slowly and excessive drowsiness or unconsciousness, which are indicative of severe illness. Only 3.1% of the mothers knew all the danger signs. The study, which involved a total of 907 mothers/caregivers, adopted both quantitative and qualitative approaches. The study also utilised focus group discussions and semi- structured questionnaire as data collection tool, which was deemed appropriate because it enabled them to gather rich and in-depth information. The prolonged study of the participants in the field through the longitudinal study design made the research findings factual and more credible.

Similar studies carried out in Nigeria in the West African Sub-Region have cited several reasons considered to be perceived causes of diarrhoea by most caregivers. These include 'bad water', normal development such as teething, consumption of certain foods or spoilt breast milk, changes in weather, worms, pollution or exposure to impure things, malevolent spirits or evil eye, immoral behaviour of parents during pregnancy or lactation, infection, and emotional states such as loneliness and fear. However, tooth eruption (teething), contaminated water and food are often considered as the major cause of diarrhoea by most caregivers. Diarrhoea linked

with teething is often not perceived as an illness by some caregivers but rather as a normal stage of childhood development, and treatment may not be sought until symptoms of severe dehydration or vomiting develop (Omotade, Adeyemo, Kayode, & Omatade , 2000; Uchenda, Emodi, & Ikefua ,2008; Adimora,Ikefua, & Ilechukwu, 2011). In relation to caregivers' level of knowledge on the causes of diarrhoea, Adimora et al. (2011), maintains that it is relative to the kind of intervention taken by them to manage the diarrhoea. These interventions sometimes have negative consequences on the health of children especially when inappropriate and untimely measures are taken. The outcome of this is increase in mortality and morbidity rates of diarrhoea. .

Other related studies conducted in India have also revealed knowledge deficit among mothers concerning diarrhoea, its associated danger signs as well as its home management practices. The researchers recommend the need for urgent and further inquiry for this knowledge gap among mothers, since major efforts have been made over the past 25 years in India to promote proper home-based management of diarrhoea in children (Shah, Ahmad, Khalique, Anasari, & Khan,2011; Shah, Ahmad, Khalique, & Afazal,2012)

Similarly, Ansari, Ibrahim, and Shankar (2011) examined mothers' knowledge about diarrhoea and its associated danger signs among a marginalised community of Morang in Nepal. The finding of the study indicates that although mothers were aware about diarrhoea and its home management, their level of knowledge pertaining to vital issue like danger signs of dehydration due to diarrhoea was very poor. From the study, majority (about 79%) of the mothers opined thin watery stool, repeated vomiting and febrile conditions as indicative of more serious diarrhoea. However, most of them were unaware of other important signs of dehydration such as sunken eyes, thirst (eagerly drinking), skin pinch receding slowly, passage of

concentrated or dark coloured urine, a drowsy child and the child not getting better after three days. The findings of the study also revealed a positive correlation of maternal educational level, age and occupation, husbands' income and family size with mothers' level of knowledge about diarrhoea and its prevention.

The study, which was community-oriented, and the first of its kind in Nepal involved a total of 130 mothers between 16–40 years of age with a child below the age of 45 months having diarrhoea at the time of the study or in the preceding three to six months. The study design was cross-sectional adopting quantitative approach with the use of structured questionnaire as data collection tool. Even though the use of the quantitative research approach enabled the study to achieve its objectives, a qualitative approach would have provided much more in-depth information about childhood diarrhoea and its home management among mothers in the Musahar community of Morang, especially as this study was the first of its kind in Nepal. It is important, however, to point out that in this current study quantitative approach is being used because of extensive literature on the subject exists.

Contrary to the findings just described in the study by Ansari et al (2011) that maternal educational level positively correlates with mothers' level of knowledge about diarrhoea and its prevention, Uchenda et al (2008) indicate that there is no relation in maternal educational level and their level of knowledge with respect to the perceived causes of diarrhoeal diseases. They however, cautioned that although their study did not show any divergence in terms of performance between caregivers with different educational level, higher maternal educational level is well recognised as a protective factor for childhood survival and confers the advantage of being able to understand and comply with life-saving health practices.

2.4 Feeding practices during diarrhoeal episode

The role of quality nutrition and good feeding practice cannot be overestimated in children, especially in children under five as they play essential role in children growth and development as well as their ability to withstand infections. The MOH, WHO and UNICEF recommends exclusive breastfeeding throughout the first six months of life, the introduction of local, nutrient rich complementary foods subsequently with continued breastfeeding to two years of age and beyond (WHO, 2001; WHO, 2003; MOH, 2007-2015).

According to proceedings report by WHO and UNICEF on strengthening action to improve feeding of infants and young children 6-23 months of age in nutrition and child health programmes, appropriate complementary feeding is vital in attainment of healthy growth and developmental potentials as well as the continued existence of every young child. Lack of appropriate breastfeeding and complementary feeding practices are main causes of under nutrition. This is also a direct cause of mortality in children, and a major limitation factor in survival children from reaching their full developmental potentials. It is estimated that 32% of children less than 5 years of age in developing countries are stunted and 10% are wasted due to poor feeding practices (WHO, 2008)

Mortality in Children as result of diarrhoea, as noted by WHO and UNICEF, is often due to an underlying malnutrition, which makes them more vulnerable to diarrhoea. Each incidence of the diarrhoeal episode makes their malnutrition worse. It has been affirmed that diarrhoea is a major cause of malnutrition in children under five years old, which accounts for about one-third of the 9.7 million child deaths that occur each year (WHO, 2003; UNICEF, 2007 & WHO, 2009)

Along with the administration of ORT, an important strategy for managing diarrhoea is promotion of appropriate child feeding, both during and after a diarrhoeal episode, to prevent excessive and uncompensated loss of nutrients. It is therefore required that a child should be given increased fluid and continued feeding during and after diarrhoeal episode in order to prevent dehydration and malnutrition.

Some studies have indicated that in developing countries, where malnutrition and diarrhoea are more common, early inception of complete nutrition in acute diarrhoea has several potential benefits for the child such as decreasing stool volume and duration of diarrhoea (Behrman & Kliegman, 2004; Walke et al., 2004; King, Glass & Bresse, 2003). Other studies, however, have shown that in many societies, the parent's remedial response to diarrhoea is to withhold food and fluid, including breast-milk, in the mistaken belief that this will stop the diarrhoea and ease the strain on the intestine. This 'treatment' according to WHO (1985), only adds to the dehydration and malnutrition caused by the illness.

In Ghana, findings of the Multiple Indicator Cluster Surveys (MICS) conducted in 2006 indicated that mothers withhold food and fluid during diarrhoeal episode. In the survey, it was found that about one-third (34%) of under-five children with diarrhoea drank more than usual while 65% drank the same or less. Half of under-five children with diarrhoea ate somewhat less, same or more (continued feeding), and also half ate much less or ate nothing.

Othero et al (2008), in a study on house household perception and practices regarding home management of diarrhoea among children under five in Nyando District, a rural community in Kenya also investigated the mothers'/caregivers' feeding practices during child diarrhoea. In the study, majority of the mothers (59.9%) reported that the children drunk much less, 20.5% affirmed that the children did not drink at all while only 10.9% reported that the

children drank more than usual. The remaining 8.6% indicated that that they drank somewhat less or about the same. On responding to the question on whether the children ate less, the same or more than usual during illness, again responses indicated that about 39.0% did not eat at all during illness, while only 6.9%) ate more than usual. Those who withheld feeds and fluids professed that continued feeding increased the rate of loose stools. One of the mothers in a focus group discussion stated: "…*the more fluids a child drinks when he/she has diarrhoea, the more frequent the lose stools and more so milk*…"

Other related studies in East Africa to assess feeding practices among mothers during common childhood illness have also shown a similar pattern of some mothers withholding food and fluid during the onset of gastrointestinal symptoms such as abdominal pain, vomiting and severe diarrhoea, and febrile illnesses (Kaatano, Muro & Medard, 2006; Neumann, Marquardt & Bwibo, 2012)

Both studies employed cross sectional study design. However, Neumann et al. employed the cross sectional design in addition to longitudinal study design. A total of 110 toddlers were followed longitudinally for a period of 12 months. The starting period for the follow up started with the day they reached 18 months of age and ended at the day they reached 30 months. The main purpose of the study was to quantify the effect of common illnesses on energy intake and compare this intake to the intake during wellness periods as well as convalescence period. The quantitative fashion of documenting food intake during period of wellness, illness and convalescence in a free-living population enabled the researchers to observe any compensatory energy intake during convalescence period. Neuman et al concluded that considerable reduction in food intake particularly during common childhood illness is unacceptable but rather feeding should be actively encouraged by mothers or caregivers in the absence of vomiting.

In another study conducted by Shah et al (2012) in the urban slum of Aligarh, India, it was found that about two-thirds (69%) of the mothers continued breastfeeding and their children during diarrhoea episode while the remaining either withheld or interrupted breastfeeding. Likewise 62.2% of mothers with children between ages 7 months to 5 years continued with the normal feeding pattern of their children. The prime reason given in the study by the mothers regarding withholding or interrupting of breast milk or fed was that breast milk is responsible for diarrhoea and therefore it ought to be withheld for so long as diarrhoea continued.

In the study, the mothers also alleged that the energy dense foods, which they took during lactation are secreted in the breast milk, causing diarrhoea, hence these foods are also supposed to be withdrawn. In addition, the caregivers in the study felt that it was much or less insignificant to continue feeding if they had started some form of diarrhoeal treatment given to them at the health-care facility. The study, which was cross-sectional, involved 300 households and a total of 101 mothers with children less than 60 months of age who had at least experienced one episode of diarrhoea in the two weeks prior to the study. The use of questionnaire as tool for data collection in the study was good enough. Nonetheless, semi structured interviews would have provided a much in-depth information since about 80% of the target study population were illiterate.

2.5 Awareness and use of RHFs and ORS

In most cases, diarrhoea related deaths in children are caused by dehydration from loss of large quantities of water and electrolytes from the body in liquid stools. Management of diarrhoea – either through ORS or RHFs - can prevent many of these deaths. ORS is a non-

proprietary name for a balanced glucose-electrolyte mixture, first used in 1969 and has since early 1980s been approved, recommended, and distributed by UNICEF and WHO as a drug for the treatment of clinical dehydration throughout the world (WHO, 2006).

The administration of fluids by mouth either in the form of ORS or RHFs to prevent or correct dehydration that is a consequence of diarrhoea alongside continuous feeding is known as ORT. The ORT has been widely considered as cheap and effective way of reducing the millions of deaths caused each year by diarrhoea. It can be delivered by health workers at very lower level health facilities like CHPS compounds, health centers and clinics and can also be practiced in the home by mothers with little guidance, and thus is a technology highly suited to the primary health care approach. Moreover, when given along with advice on proper feeding practices, ORT has been found to contribute to better weight gain and thus to reduce the ill effects of diarrhoea on nutritional status (Victora, Fontaine, & Monassch, 2000).

It is estimated that between 1980 and 2000, ORT decreased the number of children under five dying of diarrhoea from 4.6 million worldwide to 1.8 million—a 60% reduction (Kolpuru, 2008). According to WHO (2006), in the 1980s, about 4.6 million children under five years old died each year from diarrhoeal diseases and about two-thirds of these deaths were attributable to acute watery diarrhoea. In response to this momentous burden of diarrhoeal disease, the WHO introduced a special programme for Control of Diarrhoeal Diseases (CDD) in children during that period. The programme was aimed at reducing diarrhoeal mortality in the short-term and decreasing diarrhoeal morbidity in the long-term. The primary intervention chosen to reduce the diarrhoeal mortality was promotion of ORT with a solution containing glucose, sodium, potassium and a chemical base such as sodium bicarbonate.

In close collaboration with other international agencies such as UNICEF, the WHO developed global guidelines for diarrhoeal management and programme implementation. In the diarrhoeal disease control effort, increasing the use of ORT became utmost priority. The fluid given could be either ORS — a pre-packaged powder to be dissolved in a given quantity of water— or any fluid recommended by national CDD programmes for prevention or treatment of dehydration. Such fluids were labeled 'recommended home fluids' (RHF). Together, the two formed the basis for ORT. The CDD programme recommended that ideally, rehydration therapy should be given to all children with diarrhoea to prevent or treat dehydration. Furthermore, it was advised that all children with diarrhoea should be given more to drink than usual, to compensate for losses of fluid through loose stools, and that feeding should not be stopped during diarrhoea (WHO, 1989; WHO, 2006).

Kolpuru (2008) has noted that with ORT as a preferred option for preventing and treating diarrhoea, a total of about 500 million ORS sachets are produced per year, with UNICEF distributing them to children in around 60 developing countries. Despite the relatively high ORS access rates and its cost-effectiveness in preventing and managing diarrhoeal diseases, various reports and studies have indicated that the awareness and use of ORT has been limited.

Forsberg, Petzold, Tomson and Allebeck (2007) in a study conducted to determine whether there has been an improvement in diarrhoeal management from 1986 to 2003, the period during which significant effort were made to promote effective case management of diarrhoea in children, noted that ORT use has improved very little. In the study, a total of 107 household data of Demographic and Health Survey of 40 low and middle income countries were analysed to assess the trend in indicators of rehydration, fluid quantity and food intake in

children with diarrhoea. The main findings of the study suggested that there has been slight improvement with regards to the use of ORT (0.39% per year) and increased fluid intake (1.02% per year). Thus, the user rates remained low in 2003, when compared with desired full coverage. The researchers concluded that many children in low- and middle-income countries do not receive proper treatment for diarrhoea and this, points to the need in addressing the unfinished agenda in child survival. The sample size used for the study was adequate and the findings of the study appeared to be based on the objectives of the study.

Similar studies conducted in Nigeria have also revealed a drop in the level of knowledge of ORS among caregivers since its inception in the early 1990s. The authors recommended the need to intensify maternal education on ORT. Majority of caregivers enrolled in these studies knew about ORS while few of them new about sugar Salt Solution (SSS). However their knowledge level did not reflect in their ability to prepare the ORS and SSS correctly as a significant number of children received fluids in which the salt and sugar was not properly mixed with right volume of water. These studies further revealed that maternal educational level did not seem to confer any advantage on being able to correctly mix the ORT fluids (Adimora et al. 2011; Uchendu et al. 2008). Adimora et.al (2011) further added that knowledge of treatment of childhood diarrhoea at home did not necessarily follow the social class lines and hence educational level was not a very important factor in the knowledge of home management of childhood diarrhoea.

Contrary to these findings, a cross-sectional study by Kudlova (2010) revealed positive association between maternal educational level and their level of knowledge and use of ORS. However, the study recorded lower rate of awareness (27.6%) and ORS use (1.9%) among the 210 caregivers involved in the study. The study was conducted in the Czech Republic and was

aimed at investigating home management of childhood acute diarrhoea among caregivers with children between 6-59 months.

In a related study in the Morang district of Nepal by Ansari et al. (2011), it was found that mothers were cognizant with diarrhoea and its home management; however, their level of awareness was inadequate. The study indicated that mothers' knowledge about the role of ORS in diarrhoea was poor. The most common answer given by the mothers in their response to the role of ORS in diarrhoeal management was that it mostly decreases the frequency of diarrhoea whilst in some instance frequency may increase. Only 0.85% of the mothers indicated that ORS prevent dehydration in children having diarrhoea. The study attributed the poor knowledge among the mothers about the role of ORS in diarrhoea to their poor knowledge about the concept of dehydration and rehydration and strong beliefs that ORS either decreases or increases the frequency of diarrhoea.

The study also found that none of the mothers out of a total of 130 mothers enrolled in the study could indicate all the four correct steps of ORS preparation and besides, many parents gave the wrong volume of ORS solution to the child during diarrhoea. The main reason for using an incorrect volume of water during the preparation of the ORS solution was due to the use of local uncalibrated water-measuring devices. Similarly the study found that knowledge of mothers about the preparation of salt-sugar-water (SSW) was even poorer to ORS. Most of the mothers, according to the study, were not aware of preparing SSW solution and even those who were aware, most of them could not mention any of the preparation steps or they mentioned only a few steps. This was attributable to the SSW use being uncommon among the mothers and again most of the mothers not having any prior exposure to it. Furthermore, its ingredients were

not available in ready-made form unlike an ORS sachet and thus the likelihood of errors during its preparation.

In Ghana, ORT has been available in the health system since the 1980s. Nevertheless, it is estimated that less than 50% of children under-five years with diarrhoea are treated with ORT (NDPC, 2005). In the MICS conducted in Ghana in 2006, it was found that of children under-five years of age who experienced diarrhoea in the previous two weeks, only about 29% received ORS and 9% received RHFs. The survey further indicates that as many as 63% of children with diarrhoea received no ORS or RHFs. Even though, the MICS showed relatively higher ORT use in the Greater Accra Region with 39.1% of the children receiving ORS and 19.0% receiving RHFs, the usage rate was still below 50%.

Another study by Kendell, Miller, Winsor, and Hale (2009) in the rural communities within the Ejisu-Juaben District in 2008 found that although 92% of the mothers had actually heard of ORS and 86.6% described the correct preparation of the solution, only 28.4% actually used ORS for their child's most recent episode of diarrhoea. The gaps in the use of ORS as noted in the various studies suggest that there is still the need to explore the best ways to promote the use of ORS particularly in the developing countries.

2.6 Other mode of treatment of diarrhoea at home

Most cases of acute diarrhoea are self-limiting and do not require any treatment. WHO (2006) on the subject of implementing the new recommendations on the clinical management of diarrhoea, recommended ORS and fluid commonly available at home, breastfeeding, continued feeding, selective use of antibiotics, and providing zinc supplementation for 10 to 14 days for diarrhoea management. However, a worrisome practice among some caregiver is the combined

administration of quite a number of different medicines for the home management of diarrhoea aside the recommended ones. The use of these unprescribed medicines which often are orthodox or traditional or combination of both is not only harmful but increase the financial burden of the family.

A cross-sectional study by Fayaz, Aesha, Imtiya, Thankar, and Samina (2006) to asses cultural practices adopted for home management of diarrhea among mothers in villages of Kashmir Valley –India, revealed a high rate of antibiotic use (77.9%) among the respondents. The study, which was aimed at studying the treatment practices vis-à-vis clinical signs and symptoms at various health facilities, concluded that treatment practices are still improper because of lack of knowledge of practitioners in National Programmes. The authors recommended the need to stop the irrational use of antiobiotics.

Similarly, Hoan, Chuc, Ottosson, and Allebeck (2009) conducted a survey to examine the pattern of drug use among the children less than five years with respiratory illnesses and/or diarrhoea, and to analyze the relationship between various socio-economic factors and pattern of drug use. The study, which was conducted at Bavi district, Vietinam involved a total of 1,836 mothers/ caregivers with under five children who has suffered diarrhoea and/ or respiratory illness prior to the study. The study pointed out that there is major problems concerning irrational drug use among children. Antibiotics use among the respondents was 72.2 % while anti- diarrhoea drugs use was about 36.1 %. However, ORS use among children with diarrhoea was only 9.7% among children with diarrhoea. Although antibiotics was high, the study surprisingly found that children whose mothers had up to primary level of education were the least likely to use antibiotics.

In another study by Ogunrinde and Anigo (2012), they affirmed a pressing need to scale up educational and promotional activities pertaining to home management of diarrhoeal disease. The sample for the study involved home caregivers with children aged 1-59 months having diarrhoea presenting at randomly selected community primary health centres in northwestern part of Nigeria. The study highlighted that antibiotics and anti-diarrhoeal agents use was common (36%). Only 32% of caregivers were aware of the use of zinc in the management of diarrhoea. However, adherence to 10-day zinc supplementation was encouraging (75.5%).

2.7 Factors influencing caregivers' decision to seek healthcare

The desire of every parent is for their children to stay healthy, and go through the normal developmental mile stone of life. However, in the occurrence of childhood illness such as diarrhoeal illness, caregivers have considerable varying care seeking behaviour depending on several factors. Findings of a Community-based Cluster Surveys conducted by Biritwum et al. (2004) in two districts in Ghana on treatment preferences for diarrhoea, severe diarrhoea, and dysentery in children aged less than five years indicate a low-use rate of hospitals for severe diarrhoea. The study, which was conducted in Tema, an urban district and Akwapim South, a rural district, attributed the finding to the healthcare financing system of 'cash and carry' where patients without any form of health insurance pay for all services out of their pocket. For most caregivers, the cost of health care is beyond their financial capabilities.

In the study, a total of 619 and 611 caregivers respectively in Tema and Akwapim South with children under five were interviewed. About 48.8% of urban mothers of children with severe diarrhoea visited public/private clinics, 9.5% visited pharmacies, and 3.6 % visited the district hospital whereas 22.8% of the rural mothers visited public /private clinics, 19.0% visited

pharmacies and 13.9%, the district hospital. Lack of money was the main reason given in the study by the caregivers for not seeking medical attention for their children with severe diarrhoea.

In a retrospective study on health care seeking behavior, Page et al (2011) examined the proportion of children under five with diarrhoea who consulted at a health facility. This was done to identify the appropriate health care levels to set up surveillance of severe diarrhoeal diseases. The study employed cluster sampling survey involving four health district region of Mardi, Niger. Out of those reporting diarrhoea during the recall period, 70.4% reported seeking care at a health facility, and among severe cases, 83% sought care. There was no association between consultations at a health care structure and the level of education of the caretaker. The main reasons for non-consultation were spontaneous recovery and self-medication, mostly sought from roadside vendors. Financial problems were cited in approximately 10% of respondents as the main reason for the non-consultation at the health care facility.

According to Page et.al (2011), the increase in health care seeking behaviour in case of diarrhoea of children under 5 years of age in the Maradi region since the 2006 DHS survey, suggests the efficacy of recent health policies for children in Niger. They further noted the abolition of user fees for children under 5 years old in April 2007 in Niger brought a positive impact on patient behaviour, and in particular on the delay before consultation in the case of the most vulnerable groups.

In recent study by Sharkey, Chopra, Jackson, Winch, and Minkovit (2011) researched into influences on health care-seeking behaviour during final illness of infants in under-resourced South- African setting. A quantitative interview was conducted among 39 caregivers of deceased infants in a rural community and an urban township. In addition, 19 community

leaders and local healthcare providers were also interviewed. The findings of the study revealed that limited autonomy of caregivers in decision-making, lack of awareness of infant danger-signs, and identification of an externalizing cause of illness were important influences on healthcare-seeking during illnesses of infants in these settings. The study further revealed poor families faced other financial constraints that impacted their access to healthcare although in South- African public-health services are free. Sharkey et al. (2011) concluded that, often there was not one factor but a combination of factors occurring either concurrently or sequentially that determined whether, when, and from where outside healthcare was sought during final illnesses of infants.

2.8 Summary and conclusion drawn from the literature

The core objective examined in the review is pre-hospital management of diarrhoea and factors affecting it among caregivers. In relation to this objective, the discussion is prefaced by the definition of diarrhoea and the various types of diarrhoea. It proceeded to review caregivers' knowledge about causes and danger signs of diarrhoea, feeding practices among caregivers during episode, awareness and use of ORS and RHFs, other mode of treatment for diarrhoea and factors that influence caregiver's decision to seek health care during diarrhoea episode.

Conclusion drawn from the review suggests that generally there are several discrepancies about the knowledge of causes of diarrhoea among mothers / caregivers. Regarding danger signs associated with diarrhoea and how to effectively managed diarrhoea at home, caregivers' knowledge was generally poor. It also came out that a lot of factors influences caregivers' decision to seek health care during diarrhoea episode.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides information on the research design used, the study setting, sampling methods, instruments for data collection, method for analysis and ethical issues.

3.2 Research design

The research design is the overall plan for obtaining answers to research questions or for testing the research hypotheses. The research design guides the researcher in planning and implementing the study in a way that is most likely to achieve the intended goal. There are two broad approaches to research, quantitative and qualitative. According to leedy & Ormrod, (2005), quantitative research is used to answer questions about relationships of measuring variables with the purpose of explaining, predicting and controlling phenomena. Usually, it starts with one or more specific hypothesis to be tested, variables to be studied are isolated and extraneous variables are controlled. A standardised procedure is used to collect some form of numerical data, after which statistical procedures are used to analyse and draw conclusion. The quantitative study ends with confirmation of the hypotheses that were tested. On the other hand, qualitative research, as noted by Polit & Hungler (1996), involves the systematic collection and analysis of more subjective narrative materials using procedures in which there tends to be a minimum researcher imposed control

In this study, a quantitative approach with a cross- sectional design was adopted. It involved taking a cross-section of eligible caregivers at the time of the study and finding out the extent of their knowledge in pre-hospital management of diarrhoea. Cross-sectional studies, also

known as one-shot studies, are designed to study a phenomenon by taking a cross-section of it at a time. They are comparatively cheaper to undertake and easy to analyse even though they cannot measure change. It necessitates processing of quantitative data and enables the researcher strive for breadth rather than depth towards making valid general observations (Barbie, 1989). The cross-sectional study was considered the most appropriate for collecting data on the objects for this study.

With regard to the quantitative approach, the proponents of it or positivism school contend that human behavior in the social sciences, just as physical phenomena in the natural sciences, is quantifiable in attributes and subject to generalizations that have universal applicability (Bacho, 2001). This approach seeks to test the correlation between variables and even though critiques hold the view that it provides narrow lens of research by focusing on specified set of variables, it helps to avoid faulty conclusions, minimizes misrepresentations and guards against manipulation (Enu-Kusi, 2010).

3.3 Study setting

The study was conducted at PML Children Hospital. The hospital was established in 1926 and was named after Her Highness Princess Louise Marie, the grand-daughter of Queen Victoria. It is located in the central business district of Accra. The community is Korle-Wokon, a highly populated indigenous Accra settlement with poor environmental sanitation. As a result of this, communicable diseases especially diarrhoea and malaria are regularly reported from the area. The catchment population is estimated to be about 39,496 (PML Hospital Annual Report, 2011).

The hospital is a specialized hospital that offers integrated service in the management of childhood illness. Apart from providing efficient, prompt and affordable peadiatric care, the hospital also offers other services such as reproductive and child health, family planning, nutrition rehabilitation service, dental , eye, ear nose and throat, asthma, HIV, oral rehydration point and sickle cell clinic. It has a bed complement of 74. The set up includes OPD where patients are sorted out for attention, four in-patient wards, emergency ward and injection room. There are also dispensary, laboratory, medical records, catering, public health and general administration units, as well as a mortuary. The hospital also has a recreational area for children.

The hospital runs 24-hour emergency services. Patients are normally seen on daily basis at the OPD and are sorted out either by appointment, referral or as an emergency. The total OPD attendance for 2010 and 2011 was 70,911 and 75,288 respectively. On average, 206 patients were seen at the OPD on daily basis in 2011. In-patient admission was 3788 in 2010 and 4519 in 2011.

3.4 Target population / inclusion and exclusion criteria

The target population is the total group of subject about whom the investigator is interested and to whom the results could reasonably be generalised (Leedy & Ormrod, 2005: 71-106). The caregivers used for the study were recruited from the emergency ward and ORT corner of the PML Children's Hospital. The target population for the study was all caregivers with children under five reporting at the PML Children Hospital with diarrhoea with or without other symptoms**.** These people were chosen as the target population because they had the characteristics that the researcher was looking for and could provide answers to the research

question. The research excluded caregivers referred from other health facility and those who had already visited other health facility. Caregiver of patients who fell outside the inclusion criteria, for example those diagnosed with other ailment aside diarrhoea were also excluded.

3.5 Indicators and variables

Table 2 provides the details of indicators and operational definitions of major variables that were used in the study.

Table 2: Indicators, variables and their definitions

Objectives	Indicators	Variables	Definition of variables	Source of Data
To determine caregivers' understanding of diarrhea, its causes and the associated danger signs	Proportion of caregivers understanding diarrhoea	Understanding of diarrhoea	Understanding diarrhoea means being able to define or identify the disease (i.e. frequent passing of watery stool – 3 or more times)	Interview with caregivers
	Proportion of caregivers understanding causes of diarrhoea	Extent of knowledge about causes of diarrhoea (adequate, some or no knowledge)	-Adequate knowledge means being able to mention at least 3 causes of diarrhoea (e.g. contaminated food, contaminated water, poor environmental sanitation, bottle feeding etc) -Some knowledge means being able to mention less than three causes of diarrhoea -No knowledge means not able to mention any of the causes of diarrhoea.	Interview with caregivers
	Proportion of caregivers understanding danger signs of diarrhoea	Extent of knowledge about danger signs of diarrhoea (adequate, some or no knowledge)	-Adequate knowledge means being able to mention at least 3 danger signs (Becoming weak or lethargic, repeated vomiting, marked thirst of water, reduced urine input, frequent passing of watery stool) -Some knowledge is defined as being able to mention less than three danger signs -No knowledge means not able to	Interview with caregivers

Objectives	Indicators	Variables	Definition of variables	Source of Data
			mention any of the danger signs	
To examine the extent of caregivers' awareness and use of ORS and RHF for home management of diarrhoea	Proportion of caregivers aware of RHFs	Extent of awareness of RHF (adequate, some or no awareness about RHFs)	-Adequate awareness means being able to mention at least 3 RHFs (sugar and salt, coconut, rice water, porridge, mashed kenkey etc) -Some awareness is defined as being able to mention less than 3 RHFs -No awareness means not able to mention any RHFs	Interview with caregivers
	Proportion of caregivers giving RHF prior to the hospital	Use of RHF prior to the hospital	Use of RHF means starting the child with any of the RHFs before sending the child to the hospital	Interview with caregivers
	Proportion of caregivers aware of ORS	Awareness of ORS	Awareness of ORS means having heard about ORS before	Interview with caregivers
	Proportion of caregivers giving ORS prior to the hospital	Use of ORS prior to the hospital	Use of ORS means starting the child with ORS before sending the child to the hospital	Interview with caregivers
	Proportion of caregivers knowing the correct use of ORS	Extent of knowledge in the correct use of ORS (adequate, some or no knowledge)	Adequate knowledge means being able to mention all the following three processes correctly (preparation of ORS, frequency of administering ORS, duration of mixed ORS) Some knowledge means being able to mention less than the three processes correctly No knowledge means not able to mention any of the processes correctly.	Interview with caregivers
To examine feeding practice among caregivers before and during the diarrhoea episode	Feeding pattern among the caregivers	Types of feeding given to children on normal basis	Types of feeding includes breast-milk only, breast-milk + infant formula (SMA, lactogen, cerelac etc), infant formula only, normal family diet, modified family diet	Interview with caregivers
	Proportion of caregivers giving continued feeding	Continued feeding	Continued feeding is giving the child the same or increased quantities of foods during the diarrhoea episode as before the diarrhoea started	Interview with caregivers

Objectives	Indicators	Variables	Definition of variables	Source of Data
	Proportion of caregivers giving continued fluid	Continued fluid	This is giving the child the same or increased quantities of fluid during the diarrhoea episode as before the diarrhoea started	Interview with caregivers
To identify other mode of treatment, which caregivers give during diarrhoea episode	Proportion of caregivers resorting to other mode of treatment prior to sending the hospital visit	Other mode of treatment for diarrhoea at home	This includes the use of open descriptions medicine such as anti-diarrhoea, paracetamol syrup, antibiotics, herbal preparation etc	Interview with caregivers
	Sources and use of other mode of treatment	Source of other mode of treatment	Sources mean where the caregivers get the treatment from (e.g. chemist/drug store, drug peddlers, community health workers, left over of prescribed drugs etc)	Interview with caregivers
	Proportion of caregivers aware of zinc tablet	Awareness of zinc tablet	Awareness of ORS means having heard about zinc tablet before	Interview with caregivers
To examine factors that affect caregiver's decision to seek health care.	Duration of illness	Number of days of illness prior to seeking treatment at the hospital	Number of days of illness means the number of days care givers wait till seeking treatment at the hospital when the diarrhoea occurs	Interview with caregivers
	Ability to pay	Caregivers with health insurance	Caregivers with health insurance is defined as caregivers having valid health insurance during the diarrhoea episode	Interview with caregivers

Source: Author's construct, January, 2013

3.6 Sample size and sampling method

A sample is a representative sub-group of the population that meets the research's criteria (Leedy & Ormrod, 2005). Minimum sample size was obtained using the total number of under five children who visited the PML Children Hospital in 2011 with diarrhoea as a proxy. The total patients visiting the hospital in 2011 were 75,288 out of which 62,346 were children under five. The statistics further indicate that a total of 7,732 children under five reported with

diarrhoea and vomiting at the hospital in 2011 (PML Children Hospital Annual Report, 2011). With this finite population (7,732), the sample size for the caregivers was determined by adopting the following statistical formula for minimum sample size calculation (Yamane, 1967):

$$n = \frac{N}{1 + N\,(e)^2}$$

N = the sampling frame (i.e. the total number of caregivers visiting the hospital with children under 5 diagnosed with diarrhoea and other related conditions)

e = the margin of error. 10% (0.10) was used

n = the minimum sample size of caregivers visiting the hospital with children under 5 diagnosed with diarrhoea.

From the above;

$$n = \frac{7{,}732}{1 + 7{,}732\,(0.1)^2}$$

$$n = \frac{7{,}732}{78.32}$$

$$n = 99$$

Based on the above calculation, a minimum sample size of 99 was obtained from the target group. This was approximated to 100 and using a response rate of 80%, the figure was further increased to 120 as the sample size. The additional 20 was to make room for possible incomplete questionnaires or unanswered questionnaires.

Purposive sampling technique was used to select participants for the study. The selection was based on the researcher belief that the researcher's knowledge about the

population can be used to hand pick the cases to be included in the sample. This was done by selecting caregivers with children under five presenting with diarrhoea at both the ORT corner and the emergency room who met the inclusion criteria. Those who consented to be part of the study and could speak English, Ga and Twi were recruited in the study. This was due to the fact the researcher could speak and understand those dialects.

3.7 Data gathering procedure

The data gathering procedure describes the method of gathering the study information (Leedy & Ormorod, 2005). The participants under the study were recruited from the ORT corner and the emergency ward at various times throughout the study period. This was done by selecting caregivers with children under five who had diarrhoea and had been referred (after being triaged at the nurses' desk at the OPD) to the ORT corner for the already prepared ORS to be given to the children while waiting at the OPD to be seen by doctors at the various consulting rooms. The researcher ensured that the children's vital signs were checked at the nurses' desk at OPD, attended to at the ORT corner and they were in stable condition before enrolling the caregivers into the study. To avoid any form of bias response from the participants, the researcher alerted the nurses at the ORT corner not to provide health education on diarrhoea and its home management to the prospective participants until after the consent process.

In order to ensure privacy, participants who fell within the inclusion criteria were taken into the nurses' room at the OPD one after the other after they had been attended to at the ORT corner and were waiting at the OPD to be seen at the various consulting rooms by doctors. The researcher then introduced herself to the prospective participants and then explained the purpose and benefit of the study to the participants with the help of the participants' information sheet

(Appendix A). Those who could read were provided with the participant information sheet and for those who could not read, the sheet was explained to them. After the explanation, those who agreed to take part in the study signed a volunteer agreement sheet (Appendix B). Those who gave their consent to be part of the study were recruited and interviewed using questionnaire in the form of face to face interview. Prospective participants who did not give their consent to be part of the study were handed over to the ORT corner nurses for health education on diarrhoea and its home management. However, for those who gave their consent to be part of the study, they were given the health education after the interview.

The waiting time at the OPD was between one and two hours. To avoid delaying the participants and also eliminating any form of bias, arrangement were made with the nurses at the OPD for the participants to be seen by the doctors at the consulting room immediately after the interview. During the interview process, the children were also observed critically in order to alert the nurses and doctors at the OPD in case of any sudden change in condition so that prompt medical attention could be given. Participants were also encouraged to continue giving the ORS already prepared by nurses at ORT corner during and after the interview session.

For the participants with children presenting with diarrhoea with severe dehydration who were admitted directly into the emergency ward, the recruitment was done after the children had been seen by nurses and doctors at the ward and they were in stable condition. Participants who fell within the inclusion criteria for the study were recruited into the study after they had been given in-depth information about the study and what was expected of them with the help of the participant information sheet. Only those who gave their consent by signing the volunteer agreement sheet were recruited and interviewed. Every effort was made by the researcher to ensure that the interview process did not interfere with client care as well as

other nursing and medical procedure. The health education on home management of diarrhoea was done after the interview.

Data collection was carried out by the researcher herself. The questionnaires were administered to caregivers individually in the form of face-to-face interview. On the average a total of four questionnaires were completed within a day. In all, a total of 120 questionnaires were administered but 116 were successfully completed.

3.8 Data gathering tool

In a research, it is important to use already existing validated scales or questionnaires when available because their validity has already been established. But in a situation where scales or questions are not readily available it becomes imperative to design or generate appropriate questionnaires with considerable degree of content and construct validity and reliability (Punch, 2005). Questionnaire was used to collect data from the respondents because it is an appropriate tool that allows the respondent to give a self-report at free will. The questionnaire used comprised 27 items with both open and close ended questions to enable as much information as possible to be captured (Appendix C). The questionnaire was divided into six sections: socio-demographic characteristics of the respondents, knowledge about diarrhoea and the danger signs associated with it, awareness and use of ORS and ORT for home management of diarrhoea, feeding practices before and during diarrhoea episode, other mode of treatment which caregivers use during diarrhoea episode and factors that influence caregivers' decision to seek health care.

3.9 Data processing and analysis

Data of 116 caregivers were used for the analysis. The data collected were edited to check for consistency and accuracy. They were coded using numeric values to reduce the level of entering errors and were analysed using a Statistical Product and Service Solution (SPSS version 16.0). SPSS is a powerful statistical package with strong statistical applications which can easily run all the traditional statistical technique such as cross tabulation, chi-square test, Mann-Whitney teat, sample t-test, anova, regression, associations and correlation (Polar Engineering Consulting Limited, 2007).

The analysis of the data was conducted initially using descriptive statistical procedures. Mean, median, mode and standard deviation were reported for continuous variables and percentage was reported for categorical variables. Statistical tests involving Chi-square and Mann-Whitney Tests were performed. The chi-square tests were performed for the categorical data and the tests were conducted to determine the following relationships: the relationship between caregivers' educational level and understanding about causes and danger signs of diarrhoea; the relationship between caregivers' educational level awareness and use of RHFs and ORS; and relationship between caregivers' educational level and correct use of ORS. The Mann-Whitney test was also performed for data with continuous variables and the test was conducted to ascertain the relation between caregivers' ability to pay and duration of illness at home before seeking care at health facility. All tests were carried out with a significance level of 0.05 and a two sided confidence interval of 95%.

3.10 Validity and reliability of questionnaire

The validity and reliability of questionnaire is a criterion by which a quantitative instrument is adequately evaluated. According to Leedy & Ormrod (2005), reliability is the degree of consistency or dependency with which an instrument measures the attribute it is designed to measure whiles validity is the extent to which an instrument measures what it actually intended to measure. To ensure quality and confidence of the data, additional measures were taken to control the data by making sure the caregivers and their children were comfortable. Good rapport was also ensured so that caregivers would provide correct data. Again, correct interpretation and analysis of data was done by using appropriate statistical analysis. Based on these, it can be argued that the questions and responses have reasonable and substantial degree of validity.

Reliability was ensured by conducting a pilot study at Ridge Regional Hospital Peadiatric Unit. The pilot study helped in eliminating some questions which were irrelevant. It also helped in the development, translation and assessment of clarity of the questionnaire by the researcher and by those on whom the questionnaire was tested. A total of 10 caregivers with the characteristics of the study sample were interviewed using questionnaire. Permission was sought from the Deputy Director of Nursing in-charge of the Peadiatric Unit of Ridge Hospital for the pilot. The purpose of the study was explained to her after which, she together with the nurses at the unit helped me to gain access to the caregivers. The objective of the study was explained to the caregivers and those who consented to participate were interviewed using the questionnaire in the form of face-to-face interview after which the questionnaires were analysed.

3.11 Ethical consideration

Research ethics describe a broad field of enquiry that examines appropriate and inappropriate conduct in research. They are important standards that must be strictly adhered to when conducting a research. . In ensuring ethical acceptability of the study, the researcher ensured that the research was designed, conducted and reported in accordance with recognised scientific competence and ethical approval.

Ethical approval was sought from the Noguchi Memorial Institute for Medical Research and Ghana Health Service Ethical Review Committee (Appendices D & E). A letter of introduction was obtained from the School of Nursing, University of Ghana to the PML Children Hospital for the purpose of seeking permission to gain entrance to the research setting and the participants of the study (Appendix F). The letter indicated the nature and purpose of the research.

Issues regarding informed consent, confidentiality, anonymity, risks and benefits, freedom to participate and withdraw from the study at anytime without giving reasons were addressed. The researcher explained the purpose of research to each participant with the aid of participant information sheet (Appendix A). After the explanation, the participants were given the volunteer agreement sheet to complete and sign to certify that they had understood and agreed to be participants (appendix B). Individual participants were given codes to maintain anonymity and to ensure confidentiality.

CHAPTER FOUR

ANALYSIS OF DATA

4.1 Introduction

This chapter presents the data analysis and findings. The presentation covers information on the sample coverage, the demographic and socio-economic characteristics of the respondents and the findings of the study in relation to the study objectives, which include: caregivers' understanding of diarrhoea, its causes and the associated danger signs, feeding practice before and during diarrhoea episode, awareness and use of RHFs and ORS, other mode of treatment of diarrhoea at home and factors influencing caregivers' decision to seek healthcare.

4.2 Sample coverage and characteristics of respondents

A total of 120 caregivers were selected for the study. Of these potential respondents, interviews were successfully completed for 116 caregivers, representing a response rate of 96.7%. Under the demographic and socio-economic characteristics of the caregivers, the data covered the age, sex, marital status, relationship of caregivers to clients, occupation and education of caregivers as presented in Table 4.1.

In terms of age distribution, the results show that those within the age group of 15 and 34 were the highest (53.4%) among the respondents. As many as 114 (98.3%) of the respondents were females. The results also indicate that 109 (94.0%) of the respondents were mothers to the clients and 63.8% of them worked in the informal sector (trading, hairdressing, tailoring etc) while 20.7% of them were unemployed. Again, 81 (69.8%) of the respondents have had basic or lower level of education with the remaining 35 (30.2%) having had secondary or higher level of education.

Table 4.1: Demographic and socio-economic characteristics of the respondents

Demographic / socio-economic characteristics		Frequency	Percent
Age distribution of caregivers	15 – 24	25	21.6
	25 – 34	62	53.4
	35 & above	29	25.0
	Total	116	100
Sex of caregivers	Female	114	98.3
	Male	2	2.7
	Total	116	100
Marital status of caregivers	Married	89	76.7
	Co-habiting	18	15.5
	Others	9	7.8
	Total	116	100
Relation of caregivers to client	Mother	109	94
	Others	7	6.0
	Total	116	100
Occupation of caregivers	Traders	55	47.4
	Trades- hairdressing, seamstress, etc	19	16.4
	Unemployed	24	20.7
	Others	18	15.5
	Total	116	100
Educational level of caregivers	Basic or lower level of education	81	69.8
	Secondary or higher level of education	35	30.2
	Total	116	100

Source: Field data, 2013

4.3 Knowledge about causes and the associated danger signs of diarrhoea

Data on this section was presented along the following: respondents' knowledge about diarrhoea, its causes and danger signs, relationship between respondents' educational level and knowledge of causes of diarrhoea as well as relationship between respondents' educational level and knowledge of danger signs of diarrhoea. The data were analysed using frequency tables and chi-square tests.

Respondents' knowledge about diarrhoea, its causes and danger signs

Table 4.2 provides analysis on the respondents' knowledge about diarrhoea, its causes and danger signs. Of the 116 respondents, as many as 114 (98%) of them were able to rightly define or identify diarrhoea (that is, frequent passing of 'watery stool', three or more times in a day). With regard to the respondents' knowledge about causes of diarrhoea, since the respondents were able to mention more than one cause of diarrhoea, the percentages do not necessarily add to 100. Infection was top (43.10%) among the attributable cause of diarrhoea by the respondents. Other reasons assigned by some of the respondents (13.79%) to the causes of diarrhoea were food allergy, worm infection, change of environment, sore in the stomach, mosquito bite, too much sweet and sugary food, cold food, breast milk and poor environmental hygiene.

Like the causes of diarrhoea, the respondents were able to mention more than one danger sign of diarrhoea and therefore the percentages do not necessarily add up to 100. Top among the danger signs of diarrhoea mentioned by the respondents were frequent passing of stool (67.24%) and becoming weak / lethargic (50.86%). None of the respondents knew about blood in stool and marked thirst as danger signs of diarrhoea.

Table 4.2: Respondents' knowledge about diarrhoea, its causes and danger signs

		Freq.	Percent (%)
Knowledge about diarrhoea	Frequent passing of 'watery stool' (3 or more times)	114	98
	Others (phlegms, greenish stools etc)	2	2
	Total	116	100
Causes of diarrhoea	Infection	50	43.10
	Food poisoning/contaminated food	49	42.24
	contaminated water	33	28.45
	Teething	22	18.97
	No idea	23	19.83
	Others	16	13.79
Danger signs of diarrhoea	Frequent passing of stool	78	67.24
	Becoming weak or lethargic	59	50.86
	Repeated vomiting / vomiting everything	32	27.59
	Fever	21	18.10
	Poor feeding (reduced food intake)	15	12.93
	Others	12	10.4

Source: Field data, 2013

Relationship between respondents' educational level and knowledge of causes of diarrhoea

Table 4.3 provides analysis on the respondents' educational level versus their level of knowledge about causes of diarrhoea. The results indicate that 19 (16.4%) of the respondents had adequate knowledge about causes of diarrhoea (that is, they were able to mention three or more of causes of diarrhoea as defined in chapter 3) while 67 (57.8%) of them had some knowledge about the causes of diarrhoea (that is, they were able to mention less than three causes of diarrhoea). The remaining 30 (25.9%) of the caregivers had no knowledge about causes of diarrhoea (that is, they could not mention any cause of diarrhoea or had no idea about causes of diarrhoea).

Table 4.3: Respondents' educational level vs. knowledge of causes of diarrhoea

Caregivers' knowledge of causes of diarrhea	Educational level of caregivers					
	Basic or lower level of education		Secondary or higher level of education		Total	
	Freq.	%	Freq.	%	Freq.	%
Adequate knowledge	5	6.2	14	40.0	19	16.4
Some Knowledge	48	59.3	19	54.3	67	57.8
No knowledge	28	34.6	2	5.7	30	25.9
Total	81	100.0	35	100	116	100.0

Source: Field data, 2013

The results further indicate that 59.3% of the respondents with basic or lower level of education (that is, middle/JHS, primary and no formal education) had some knowledge about causes of diarrhoea while 34.6% of them had no knowledge about causes of diarrhoea. Only 6.2% had adequate knowledge about causes of diarrhoea. Among the respondents with secondary or higher level of education (that is, SHS, post SHS, tertiary etc), 40% of them had adequate knowledge about causes of diarrhoea while 54.3% had some knowledge about the causes of diarrhoea with only 5.7% having no knowledge about causes of diarrhoea.

A chi square test conducted established a significant difference in the knowledge about causes of diarrhoea between caregivers' with basic / lower level of education and those with secondary / higher level of education (Appendix G). The test results were: (X^2 = 25.046, df= 1,

P < 0.05). This suggests that the respondents' educational level had a relationship with their level of knowledge about causes of diarrhoea.

Relationship between respondents' education and knowledge about danger signs of diarrhoea

Table 4.4 provides analysis on the respondents' educational level versus knowledge about danger signs of diarrhoea. From the results, 62.1% of the respondents had some knowledge about the danger signs of diarrhoea (that is, they could mention less than three dangers signs) while 20.7% of them had adequate knowledge of the danger signs (that is, they could mention more than three danger signs). The remaining 17.2% of the respondents did not know about the danger signs (that is, could not mention or have no idea of any of the danger signs of diarrhoea).

Table 4.4: Respondents' educational level vs. knowledge of danger signs of diarrhoea

	Educational level of caregivers					
	Basic or lower level of education		Secondary or higher level of education		Total	
Caregivers' knowledge of danger signs of diarrhoea	Freq.	%	Freq.	%	Freq.	%
Adequate knowledge	16	19.8	8	22.9	24	20.7
Some Knowledge	55	67.9	17	48.6	72	62.1
No knowledge	10	12.3	10	28.6	20	17.2
Total	81	100.0	35	100.0	116	100.0

Source: Field data, 2013

The results further demonstrate that 19.8% of the respondents with basic or lower level of education had adequate knowledge while 67.9% had some knowledge about danger signs of diarrhoea. In the case of respondents with secondary or higher level of education about 22.9% of them had adequate knowledge while 48.6% had some knowledge about danger signs of diarrhoea. Again, 28.6% of the respondents with higher level of education had no knowledge about danger signs of diarrhoea.

A chi square test conducted established no significant difference between the respondents' educational level and their knowledge about danger signs of diarrhoea (Appendix H). The test results were: (X^2= 5.317, df=2, $p > 0.05$). Thus, the respondents' educational level did not have any relationship with the level of knowledge about danger signs of diarrhoea.

4.4 Feeding practice during diarrhoeal episode

The study investigated caregivers' feeding practices during the diarrhoea episode. The respondents were asked about the child's age and the type of feed given to him/her and whether the child was given less, same amount or more than usual to eat and/or drink during the diarrhoea prior to the hospital visit. The data were analysed using frequency tables.

Age of children versus type of feeds given them

Table 4.5 presents the analysis on the age of the respondents' children with diarrhoea versus the type of feeds given to them. Exclusive breastfeeding was top (66.7%) among the feed given to the children within age 0-6 months. This was followed by breast milk plus infant formula (27.8%) and complementary feeding plus breast milk (5.6%).

Table 4.5: Age of children with diarrhoea vs. type of feeding given to them

	Age category							
	0-6 months		7-24 months		25 & above months		Total	
Type of feeding	Freq	%	Freq	%	Freq	%	Freq	%
Breast milk only	12	66.7	1	1.2	0	0.0	13	11.2
Breast milk plus infant formula	5	27.8	1	1.2	0	0.0	6	5.2
Complementary feeding only	0	.0	5	6.1	0	0.0	5	4.3
Complementary feeding plus breast milk	1	5.6	29	35.4	0	0.0	30	25.9
Normal family diet	0	.0	24	29.3	15	93.8	39	33.6
Normal family diet plus breast milk	0	.0	22	26.8	1	6.2	23	19.8
Total	18	100	82	100	16	100	116	100

Source: Field data, 2013

In the case of the children within age 7 and 24 months, complementary feeding plus breast milk was top (35.5%) among the feeds given to them and this was followed by normal family diet (29.3%) and normal family diet plus breast milk (26.8%). For those beyond two years (that is, age 25 months and above), as many as 93.8% of them were given normal family diet while the remaining 6.2% were given normal family diet plus breast milk.

Pattern of food intake among the children with diarrhoea prior to the hospital visit

Table 4.6 presents analysis on the pattern of food intake among the children with diarrhoea prior to the hospital visit. The results show that 25% of the children were given the same or more than usual to eat while 75% were given much less or somewhat less to eat. Most

of the respondents whose children were given much less or somewhat less indicated that the children had lost appetite and refused to take in any food. Others also explained they did not want to give much food to their children because they wanted to prevent vomiting as the children vomit any food taken. Again a few of them indicated that they gave less to their children to eat because they felt more food intake would increase the frequency of the diarrhoea.

Table 4.6: Pattern of food intake prior to the hospital visit

Food intake	Frequency	Percent (%)
About the same	25	21.6
More than usual	4	3.4
Much less	47	40.5
Somewhat less	40	34.5
Total	116	100

Source: Field data, 2013

Pattern of water intake among the children with diarrhoea prior to the hospital visit

Table 4.7 also presents the pattern of water intake among the children with diarrhoea before presentation at the hospital. From the results, 35.3% of the children drank the same or more than usual while 64.7% of them drank much less or somewhat less. Some of the respondents whose children drank more than usual or the same explained that the children themselves asked for more water while others also indicated that they gave the water to the children to prevent dehydration or replace fluid loss through dehydration. In the case of the children who drank much less or somewhat less some of the caregivers indicated that they did not want to give their children more water to prevent further vomiting. Others also explained that the children themselves refused to take the water.

Table 4.7: Pattern of water intake prior to the hospital visit

Water intake / reasons	Frequency	Percent (%)
About the same	33	28.4
more than usual	8	6.9
Much less	46	39.7
Somewhat less	17	14.7
No water	12	10.3
Total	116	100

Source: Field data, 2013

4.5 Awareness and use of RHFs and ORS

This section focused on the following: respondents' awareness and use of RHFs and ORS, the relationship between caregivers' educational level and awareness and use of RHFs and ORS as well as the relation between caregivers' educational level and knowledge of correct use of ORS. The analysis was done through the use of frequency tables and chi-square tests.

Respondents' awareness and use of RHFs and ORS

Table 4.8 presents analysis on the respondents' awareness and use of RHFs and ORS. Almost all the respondents (99.1%) claimed they were aware of ORS. However, only a little over half (55.2%) of them gave ORS to their children prior to the hospital visit. In the case of RHFs, Only 29.3% and 23.3% of the respondents respectively indicated that they were aware and actually gave their children some RHFs before presentation at the hospital.

Table 4.8: Respondents' awareness and use of RHFs and ORS

		Frequency	Percent (%)
Caregivers' awareness of RHFs	Yes	34	29.3
	No	82	70.7
	Total	116	100
Caregivers' awareness of ORS	Yes	115	99.1
	No	1	0.9
	Total	116	100
RHFs use by caregivers	Yes	27	23.3
	No	89	76.7
	Total	116	100
ORS use by caregivers	Yes	64	55.2
	No	52	44.8
	Total	116	100

Source: Field data, 2013

For the respondents who said they were aware of RHFs, water and coconut water were the most common RHFs mentioned by them. The rest were sugar and salt solution porridge, rice water and mashed kenkey. Apart from these RHFs, some respondents mentioned other fluids like coke, yoghurt, coke mixed with paracetamol and coke mixed with salt, which they perceived as RHFs. Again, water, coconut water, porridge and sugar and salt solution were the common RHFs the respondents claimed they gave to their children prior to the hospital visit.

Table 4.9 further presents information on the respondents' perception about why ORS should be given to children with diarrhoea. Highest among the reasons assigned by respondents was to decrease the stool output (53.4%). The second highest among the reasons assigned was to replace lost fluid or prevent dehydration (37.9%).

Table 4.9: Respondents' perception about the use of ORS

Reasons for giving ORS to children with diarrhoea	Frequency	Percent (%)
To decrease the diarrhoea or stool output	62	53.4
To replace lost fluid / prevent dehydration	44	37.9
No idea	8	6.9
Others	2	1.7
Total	116	100.0

Source: Field data, 2013

Correct use of ORS

Knowledge about correct use of ORS was categorized into three: adequate knowledge, some knowledge and no knowledge. 'Adequate knowledge' as defined in this study is: being able to mention all the following three correctly:- right preparation of ORS (that is, 1 sachet of ORS- 600 mls or two coke bottles of water); rate of administering ORS (that is, frequent interval/after passing of every loose stool); and right duration of mixed ORS (that is, 24 hours or one day). 'Some knowledge' is also defined as being able to mention two or one of the aforementioned variables correctly while 'having no knowledge' is defined as not able to mention any of the variables correctly.

The respondents' knowledge about the correct use of ORS (that is, correct mixture, right frequency for administering and duration of mixed ORS) is presented in Table 4.10.

Table 4.10: Respondents' knowledge about correct use of ORS

Correct use of ORS		Frequency	Percent
ORS preparation	1 sachet of ORS- 500 mls of water	67	57.8
	1 sachet of ORS- 600 mls of water	24	20.7
	1 sachet of ORS- 750 mls of water	13	11.2
	1 sachet of ORS- 300mls of water	3	2.6
	1 sachet of ORS- 1500mls of water	4	3.5
	No idea	5	4.3
	Total	116	100
Frequency of administering ORS	2-3 times a day	7	6.0
	4 & above times a day	10	8.7
	After the passing of every loose stool or at frequent interval	95	81.9
	No idea	4	3.4
	Total	116	100
Duration of mixed ORS	24 hours (1 day)	100	86.2
	Over 24 hours	3	2.6
	No idea	13	11.2
	Total	116	100

Source: Field data, 2013

Only 24 representing 20.7% of the respondents knew about the recommended volume of water for mixing a sachet of ORS (that is, 600 mls or two coke bottles of water to I sachet of ORS). As many as 57.8% of the respondents felt that one sachet of ORS is mixed with 500 mls (small size of mineral bottle) of water while 11.2% also believed one sachet of ORS is mixed with 750 mls (1 medium size of mineral bottle) of water.

Regarding the rate of administering ORS, as many as 81.9% of the respondents rightly indicated that ORS should be given after the passing of every loose stool or at frequent interval. The rest had different understanding of how often ORS should be administered to children with diarrhoea. Again, for duration of mixed ORS, 86.2% of the respondents rightly indicated that mixed ORS should last for 24 hours or a day. The rest had either no idea or believed mixed ORS should last for 48 or 72 hours.

Relationship between respondents' educational level and awareness and use of RHFs and ORS

The proportions of the respondents with basic / lower level of education versus those with secondary/higher level of education who were aware of RHFs and ORS as presented in Table 4.11 were as follows: RHFs (24.7% vs. 40%) and ORS (98.8% vs. 100%). Again, as indicated in Table 4.11, the proportions of the respondents with basic / lower level of education versus those with secondary/higher level of education who gave RHFs and ORS prior to the hospital visit were as follows: RHFs (19.8% vs. 31.4%) and ORS (54.3% vs. 57.1%).

Chi-square tests conducted established no significant difference between the respondents' educational level and their awareness and use of RHFs and ORS (Appendices I, J, K & L). The test results were as follows: awareness of RHFs (X^2= 2.764, df= 1, $p > 0.05$); awareness of ORS (X^2= 0.000, df=1, $P > 0.05$); Use of RHFs (X^2= 1.866, df=1, $p > 0.05$); use of ORS (X^2= 0.079, df= 1, $p > 0.05$). Thus, the respondents' educational level did not have any relationship with their awareness and use of RHFs and ORS.

Table 4.11: Respondents' educational level vs. awareness and use of RHFs and ORS

		Caregivers' educational level					
		Basic or lower level of education		Secondary or higher level of education		Total	
		Freq.	%	Freq.	%	Freq.	%
Caregivers' awareness of RHFs	Yes	20	24.7	14	40.0	34	29.3
	No	61	75.3	21	60.0	82	70.7
	Total	81	100	35	100	116	100
Caregivers' awareness of ORS	Yes	80	98.8	35	100	115	99.1
	No	1.2	1	0.0	0.0	1	0.9
	Total	81	100	35	100	116	100
RHFs use by caregivers	Yes	16	19.8	11	31.4	27	23.3
	No	65	80.2	24	68.6	89	76.7
	Total	81	100	35	100	116	100
ORS use by caregivers	Yes	44	54.3	20	57.1	64	55.2
	No	37	45.7	15	42.9	52	44.8
	Total	81	100	35	100	116	100

Source: Field data, 2013

Respondents' educational level versus their knowledge about correct use of ORS

Table 4.12 further presents data on the respondents' educational level versus knowledge in the correct use of ORS. In general, 59.5% of the caregivers had some knowledge in the correct use of ORS while 24.1% had no knowledge in the correct use of the ORS. Only 16.4% of the caregivers had adequate knowledge in the correct use of ORS. The proportions of the respondents with basic / lower level of education versus those with secondary/higher level of education in terms of knowledge in the correct use of ORS were as follows: adequate

knowledge (14.8% vs. 20%); some knowledge (64.2% vs. 48.6%); and no knowledge (21% vs. 31.4%).

A chi-square test conducted established no significant difference between caregivers' with basic or lower level of education and those with secondary or higher level of education in terms of knowledge in the correct use of ORS (Appendix M). The test results were ($X^2 = 2.508$, df=2, $P > 0.05$). Thus the respondents' educational level had no relationship with their level of knowledge in the correct use of ORS.

Table 4.12: Respondents educational level vs. knowledge in the correct use of ORS

Caregivers' knowledge of correct use of ORS	Educational level of caregivers					
	Basic or lower level of education		Secondary or higher level of education		Total	
	Freq.	%	Freq.	%	Freq.	%
Adequate knowledge	12	14.8	7	20.0	19	16.4
Some Knowledge	52	64.2	17	48.6	69	59.5
No knowledge	17	21.0	11	31.4	28	24.1
Total	81	100.0	35	100.0	116	100.0

Source: Field data, 2013

4.6 Other mode of treatment of diarrhoea at home

Data on the other mode of treatment were presented along the following: proportion of respondents resorting to other mode of treatment prior to the hospital visit, source of medicine /

treatment, respondents' awareness about zinc tablets and respondents' perception about the use of zinc tablets. The data were analysed through the use of frequency tables.

Proportion of respondents resorting to other mode of treatment prior to the hospital visit

Table 4.13 demonstrates the proportion of the respondents who resorted to other mode of treatment for their children with diarrhoea prior to the presentation at the hospital and the sources of treatment. As many as 83 representing 71.6% of the respondents had given one or more medicines to their children prior to presentation at the hospital.

Among the 83 respondents who reported as having given their children medicines before the hospital visit, 50.6% of them gave anti diarrhoea drugs, 36.1% gave paracetamol, 31.3% gave antibiotics while 24% gave other drugs such as anti malaria, haematinics, metronidazole, flagyl , dewormer, zinc tablets, omega oil, seven sea oil and gripe water. Only 9.6% gave their children zinc tablet. It is important to point out the respondents mentioned more than one medicine and therefore the percentages do not necessarily add to 100.

Chemists / drugs stores were top (71.08%) among the source of medicine for the children with diarrhoea prior to the hospital visit. This was followed by left over prescribed drugs (24.1%) and medicine from friends / family members (4.8%). The respondents provided various reasons for giving the medicines to their children prior to the hospital visit. Most of them explained that they gave the medicine particularly the antibiotics and anti diarrhoea drugs to stop or reduce the diarrhoea and vomiting. With regard to the paracetamol syrup, anti malaria drugs, flagyl, dewomer and metronidazole the reason given was that they wanted to relieve the children of the fever and abdominal pain. Others also said they gave the haematinics to stimulate the children's appetite for food.

Table 4.13: Use of other mode of treatment and sources of treatment

		Frequency	Percent (%)
Use of other mode of treatment	Yes	83	71.6
	No	33	28.4
	Total	116	100
Sources of treatment	Nearby chemist / drug store	59	71.1
	Left over of prescribed drugs	20	24.1
	From friends or family members	4	4.8
	Total	83	100

Source: Field data, 2013

Awareness about zinc tablet and its use

Table 4.14 demonstrates the level of awareness about zinc tablet and its use among the respondents. A large number (80) representing 69% of the respondents said they had heard about zinc tablets. Most of them said they heard about it through publicity on radio and television.

Table 4.14: Respondents' awareness and knowledge in the use of zinc tablet

		Frequency	Percent (%)
Awareness about zinc tablet	Yes	80	69
	No	36	31
	Total	116	100
Use of zinc tablet	To reduce stool output	38	32.8
	To prevent diarrhoea	6	5.2
	No idea	72	62.0
	Total	116	100

Source: Field data, 2013

Regarding the use of zinc tablet, even though 69% of the respondents claimed they were aware about the tablet, as many as 62 % of them could not tell the use of the tablet. Of the remaining 38% who said they knew about the use of the zinc tablet, 32.8% of them explained that it helps to reduce the stool output while 5.2% indicated that it helps to prevent diarrhoea.

4.7 Factors influencing respondents' decision to seek care at health facility

This section focused on the following: duration of illness prior to the hospital visit, relationship between respondents' ability to pay and duration of illness before presentation at the hospital and reasons for the duration of illness prior to the hospital visit. The data were analysed using descriptive statistics and Mann-Whitney test.

Duration of illness prior to the hospital visit

Table 4.15 presents descriptive statistics on duration of illness before presentation at the hospital for treatment. From the analysis, the duration of the illness before presentation at the hospital ranged from one to seven days with an average duration of 2.5 days ± 0.98. The commonest duration of the illness prior to the hospital visit was 2 days.

Table 4.15: Duration of illness before presentation at hospital

	Freq.	Mean duration (days)	median duration (days)	Mode (days)	SD	Min no. of days	Max. no. of days
Caregivers	116	2.5	2	2	0.98	1	7

Source: Field data, 2013

Reasons for the duration of illness prior to the hospital visit

Table 4.17 provides data on reasons assigned by the respondents for waiting at home before presentation at the hospital. The reasons varied in proportion between respondents with and without valid health insurance. In the case of those with valid health insurance 55.2% of them claimed they waited at home because the condition of the children was not serious while 31% indicated they started management of the diarrhoea at home as a first aid. Only 1.7% of the respondents with valid health insurance claimed they waited at home because they did not have money.

Table 4.16: Reasons for staying at home

Caregivers	Reasons for staying at home	Frequency	Percent
Caregivers with valid health insurance	Started management of the diarrhoea at home	18	31.0
	Not having money	1	1.7
	Waiting for life partner	2	3.4
	Condition was not serious	32	55.2
	Others	5	8.6
	Total	58	100.0
Caregivers without valid health insurance	Started management of the diarrhoea at home	15	25.8
	Not having money	14	24.1
	Waiting for life partner	6	10.3
	Condition was not serious	20	34.5
	Others	3	5.1
	Total	58	100.0

Source: Field data, 2013

On the contrary, 34.5% of the respondents without valid health insurance indicated they waited at home because the condition of the children was not serious while 25.8% indicated they started the management of the diarrhoea at home as first aid. Again, compared to those with valid health insurance, as many as 24.1% of the non-health insurance holders indicated that they waited at home because they did not have money while 10.3% claimed they waited for their partners.

Relationship between health insurance and duration of illness prior to the hospital

Data on relationship between respondents' ability to pay and duration of illness before presentation at the hospital for treatment are presented in Table 4.16. The assumption here was that respondents with valid health insurance had more ability to pay than those without health insurance. The analysis indicates that 58 representing half (50%) of the respondents had valid health insurance.

Table 4.17: Relationship between health insurance and duration of illness

Caregivers	Freq.	Mean duration (days)	median duration (days)	Mode (days)	SD	Min no. of days	Max. no. of days
Caregivers with valid health insurance	58	2.3	2	2	0.84	1	7
Caregivers without valid health insurance	58	2.8	3	3	1.1	1	7

Source: Field data, 2013

Among the respondents with valid health insurance, the average duration of the illness before presentation to the hospital was 2.3 days ± 0.84 ranging from 1 – 7 days, while the commonest duration of illness prior to presentation at the hospital was 2 days. For the respondents without valid health insurance, the average duration of the illness before presentation to the hospital was 3 days ± 0.84 ranging from 1 – 7 days, while the commonest duration of illness prior to presentation at the hospital was 3 days.

A Mann-Whitney test conducted established a significant difference in the duration of illness before presentation between those with valid health insurance card holders and those without valid health insurance (Appendix N). The test results were: ($U = 1250.000$, $N_1 = 58$, $N_2 = 58$, $P < 0.05$). Thus those without valid health insurance spent more number of days at home before taking their children for treatment at the hospital as compared to those with valid health insurance.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The purpose of this study was to assess pre-hospital management of diarrhoea and factors affecting it among caregivers with children under five. The objectives included determining caregivers' knowledge about the causes and danger signs of diarrhoea; examining the feeding practice among caregivers prior to hospital visit; examining the extent of awareness and use of ORS and RHFs for home management of diarrhoea; identifying other mode of treatment which caregivers give to their children prior to hospital visit; and examining factors that affect caregivers' decision to seek health care. Data was obtained from 116 caregivers who met the inclusion criteria. The caregivers were mainly females and mothers. Most of them were aged 15 and 34 and worked in the informal sector (trading, hairdressing, tailoring etc).

The findings of the study indicated poor home management of diarrhoea including dietary restrictions during the diarrhoeal episode, low use of both RHFs and ORS but high use of other remedies such as antibiotics and anti-diarrhoea to treat diarrhoea. The discussion of the findings was done under the following thematic headings in relation to the objectives and the stated hypothesis:

i. Caregivers' understanding of diarrhoea
ii. Feeding practices among caregivers during diarrhoeal episode
iii. Prevention of dehydration through the use of RHFs and ORS
iv. The use of other modes of treatment for diarrhoea at home
v. Caregivers' health care seeking behaviour

5.2 Caregivers' understanding of diarrhoea

High morbidity and mortality especially among children under five as a result of diarrhoea can easily be prevented if caregivers have adequate understanding of diarrhoea. Caregivers' understanding about diarrhoea particularly the causes and the associated danger signs of diarrhoea, as noted by Othero et al (2008), is important to ensure timely and proper home management and even subsequent referral of children to a health care facility for treatment. In the current study, it was revealed that almost all the caregivers rightly understood diarrhoea as frequent passing of 'watery stool' (three or more times in a day). This notwithstanding, their knowledge about the causes and danger signs of diarrhoea was not satisfactory.

Over a quarter of the caregivers had no knowledge about the causes of diarrhoea while only 16.4% of them had adequate knowledge about diarrhoea. The rest (57.8%) had some knowledge about causes of diarrhoea. The commonest perceived cause of diarrhoea was infection (43.1%) followed by food poisoning / contaminated food (42.24%), contaminated water (28.45%) and teething (18.9%).

With regard to danger signs of diarrhoea, only about a quarter of the caregivers had adequate knowledge, 62.1% had some knowledge and 17.2% had no knowledge at all about them. Top among the danger signs of diarrhoea identified by the respondents were frequent passing of stool followed by becoming weak / lethargic. The caregivers were unaware of other important danger signs such as blood in stool, marked thirst and reduced urine output. Understanding of such danger signs is critical as it helps caregivers to respond promptly by giving oral fluids or to seek treatment at health facilities. This implies that there is the need for more health education for caregivers on the causes and danger signs of diarrhoea.

The findings relating to the knowledge about the causes of diarrhoea support the findings of similar studies conducted by Omotade et al. (2000), Uchenda et al. (2008), Adimora et al. (2011) in Nigeria in West Africa to assess mothers' /caregivers' knowledge about the causes of diarrhoea. The findings of those studies indicated that mothers/caregivers have inadequate knowledge about the causes of diarrhoea. Those studies also pointed out that contaminated water and food as well as teething are most often considered by the mothers/caregivers as causes of diarrhoea. Again, the observation relating to the knowledge about the danger signs of diarrhoea is similar to that of Ansari et al (2001), Shah et al (2011) and Shah et al (2012) whose studies also revealed some knowledge deficit among mothers concerning causes of diarrhoea, its associated danger signs as well as its home management practices.

In the present study, the large number of the caregivers who could describe diarrhoea might probable be due to prior exposure and experience with diarrhoeal diseases. While it is easy to remember 'watery stools' as a symptom of diarrhoea through prior expose and experience with the disease, remembering a multiple of causes and danger signs may not be easy and may require cognitive reasoning. Another factor that could have possibly contributed to the knowledge gap in the causes and danger signs of diarrhoea is the fact that health care professionals do not give enough health education on diarrhoea. As a result of the rampant nature of the diarrhoea in children, health care professionals may have taken for granted that caregivers are well informed particularly about the causes and danger signs of the disease. Caregivers are therefore denied of the needed information that could help them protect their children from this deadly but preventable condition.

Concerning the relationship between caregivers‘ educational level and knowledge of causes of diarrhoea, the findings of the current study indicate that a greater proportion (40%) of caregivers with secondary or higher level of education had adequate knowledge about causes of diarrhoea compared to those with basic or lower level of education (6.2%). The opposite was, however, the case with regard to proportion of caregivers with some knowledge about causes of diarrhoea. A relatively greater proportion (59.3%) of the caregivers with basic or lower level of education had some knowledge about causes of diarrhoea than those with secondary or higher level of education (54.3%). Similarly, the proportion of the caregivers with basic or lower level of education that had no knowledge about causes of diarrhoea was disproportionately more (34.6%) than those with secondary or higher level of education (5.7%).

With regard to the relationship between caregivers‘ education and knowledge about danger signs of diarrhoea, the findings again indicate that a relatively greater proportion (22.9%) of caregivers with higher level of education had adequate knowledge about danger signs of diarrhoea than those with lower level of education (19.8%). However, a much higher proportion (67.9%) of those with lower level of education had some knowledge about danger sings compared to those with higher level of education (48.6%). Again, a greater proportion (28.6%) of the caregivers with higher education had no knowledge about danger signs of diarrhoea compared to those with lower level of education (12.3%).

Even though the study further established a significant difference between caregivers' educational level and knowledge about causes of diarrhoea ($X^2 = 25.046$, df= 1, $P < 0.05$), no significant difference was established between caregiver's educational level and knowledge about danger signs associated with diarrhoea ($X^2 = 5.317$, df=2, $P > 0.05$). This suggests that

caregivers' education had a positive relationship with knowledge about the causes of diarrhoea but no relationship with knowledge about the danger signs of diarrhoea.

The findings as related to the causes of diarrhoea in this present study are consistent with the findings from a cross sectional study by Ansari, Ibrahim & Shankar (2011) on mothers' knowledge about diarrhoea and its management. It was found in their study that there is positive correlation of maternal educational level, age and occupation, husbands' income and family size with mother's level of knowledge about causes of diarrhoea and its prevention.

On the other hand, the findings are in contrast with the findings of a similar study by Uchenda et al. (2008) to assess how caregivers manage diarrhoea at home before seeking health care. They indicate that there is no relation in maternal educational level and their level of knowledge with respect to the perceived causes of diarrhoeal diseases. The researchers, nonetheless, cautioned that although their study did not show any divergence in terms of performance between caregivers with different educational level, higher maternal educational level is well recognised as a protective factor for childhood survival and confers the advantage of being able to understand and comply with life-saving health practices.

5.3 Feeding practices among caregivers during diarrhoeal episode

According to the MOH under-five Child Health Policy (2007-2015), exclusive breastfeeding should be promoted from birth to 6 months. Exclusive breastfeeding means that infant is breastfed and given no other solids or liquids, including water (drops of vitamins, minerals or medicines are allowed when medically indicated). In the case of complementary feeding, the policy recommends that it should begin at 6 months of age. It is also recommended that complementary foods should be of appropriate quality (energy density, micronutrient

composition, or food handling), quantity and frequency. Besides, breastfeeding should continue until 2 years of age and beyond in addition to complementary feeding. The policy further requires that a child‘s feeds are continued and increased during and after diarrhoeal episode. This is to help the body fight the offending organisms. Due to the likely loss of appetite, the feeds need to be appetizing and nutritious and be given in small frequent amounts according to the child‘s ability to tolerate.

The findings of the present study suggest a relatively high rate of breastfeeding among mothers especially for children within the first six months of birth. This is in support of recommendation by the MOH, WHO and UNICEF that children should be breastfed throughout the first six months of life, the introduction of local, nutrient rich complementary foods subsequently with continued breastfeeding to two years of age and beyond (WHO,2001; WHO,2003; MOH, 2009a). Arguably we can say that mothers are gradually embracing the health education on exclusive breastfeeding as well as continuous breastfeeding of their children to two years and beyond. Nonetheless, there is the need to intensify the education on the importance of breastfeeding among mothers especially exclusive breastfeeding, in spite of the seemly improved breastfeeding practice among mothers this study has revealed.

With regard to complementary feeding, the relatively high number of children within age 7 and 24 months who were given normal family diet instead of complementary feeds may be due to the fact that in recent time children are enrolled into school before they turn age two. Since most of these schools have the same menu for all children irrespective of their age differences, there is a high probability that these children were introduced to normal family diet at school instead of complementary feeds or modified family diet that is mashed or cooked very soft. There is therefore the need for MOH/GHS to collaborate with Ghana Education Service to

include pre-schools in school health programme and also ensure that food offered are nutritious and hygienically prepared and contain the appropriate micro-nutrients.

Concerning continued feeding during diarrhoea episode, in the current study, the vast majority (75%) of the children were given much less or somewhat less amount of food while about a quarter (25%) was given the same or more than the usual amount of food prior to the hospital visit. With regards to pattern of fluid intake during the diarrhoeal episode, the results indicate that 35.3% of the children drank the same or more than usual while 64.7% of them drank much less or somewhat less. The findings suggest a high rate of diet restriction of children prior to the hospital. This is a concern because dietary restriction of children during diarrhoea may compromise their health.

From the findings, it could be stated that caregivers might not be well informed about some of the basic techniques of feeding sick children in order to meet their nutritional needs. The techniques include motivating the sick children to eat in bit but regularly rather than forcing food on them and also feeding them attractively with light nourishing diet instead of their normal food regimen. This observation seems to match up with findings of the Ghana MICS conducted in 2006, which also revealed that half the children involved in the survey ate somewhat less or nothing during diarrhoea episode while only about one third (34%) of under-five children with diarrhoea drank more than usual and 65% drank the same or less.

On responding to reasons for change in feeding pattern of the children prior to the hospital visit, over half of the caregivers explained that their children were eating much less or somewhat less because they had lost appetite and had refused to take in any food given them or could not suck well. Just a small proportion of the caregivers (3.4%) explained that offering the children continued feeding would increase the frequency of the diarrhoea. This rather seems to

contradict the observation made by Othero et al (2008) where most of the mothers who withheld feeds professed that continued feeding increased the rate of loose stools.

5.4 Prevention of dehydration through the use of RHFs and ORS

Diarrhoeal diseases are major target in the global efforts to increase survival and reduce the disease burden in children (UNICEF/WHO, 2009). Prevention, as noted by Bhutta et al (2010), is of primary importance in these efforts but adequate management of cases is essential to reduce mortality, in particular the administration of ORS and RHFs to treat dehydration. According to the MOH under-five Child Health Policy (2007-2015), ORT including ORS and RHFs should be used for management of acute and persistent diarrhoea. ORS should be packaged in sachets for preparation of 600 ml solution. The policy further recommends home-based fluids such as porridge, coconut juice, plain rice water, and mashed kenkey for the home-based management of diarrhoea. Meanwhile a child is closely observed for any signs of dehydration following which urgent referral is made.

The study revealed a wide gap between awareness and use of ORS among the caregivers. From the results, almost all the caregivers (99.1%) said they were aware of ORS. Ironically, only a little over half of the caregivers actually gave ORS to their children with diarrhoea prior to the hospital visit. Thus, in spite of the high level of awareness of ORS, the actual number of caregivers using ORS for the benefit of the children with diarrhoea was relatively very low. With regard to RHFs, both the level of awareness and use among the caregivers were very low compared to ORS. Only 29.3% and 23.3% of the caregivers respectively indicated that they were aware and actually used some RHFs before presentation at the hospital.

These findings support those of Kendell et al (2009), which indicated high level of awareness of ORS but relatively lower user rate of ORS among mothers. The lower user rate of FHFs and ORS among mothers is further supported by MICS conducted in Ghana in the year 2006. The survey found that of children under-five years of age who experienced diarrhoea in the previous two weeks, only about 29% received ORS and 9% received RHFs. The survey further indicated that as many as 63% of children with diarrhoea received no ORS or RHFs. Even though, the MICS showed relatively higher ORT use in the Greater Accra Region with percentages of children who received ORS and RHFs, 39.1% and 19.0% respectively the usage rate was still below 50%.

The high level of awareness of ORS compared to the RHFs among caregivers in this present study could be attributed to the high media publicity given to ORS and particularly during the recently launched of new Osmolarity ORS and zinc tablet. On the other hand, the low user rate of ORS could be attributed to factors such as non-availability of ORS sachets; mothers not being conversant with the correct preparation of ORS, misinformation about diarrhoea etc.

Some caregivers erroneously believe that diarrhoea is caused by teething and worms and this wrong perception possibly influence their decision to resort to other mode of treatment instead of using appropriate remedies like ORS and RHFs. Other possible reason which might account for the low user rates is that some children do not like the taste of ORS and may refuse to drink it. Caregivers who might have experienced this may not be encouraged to give ORS the next time the child suffers another diarrhoeal episode. Thus, it is noteworthy to promote RHFs for home management of diarrhoea as it presents the caregivers with alternative options for managing diarrhoea.

Several reasons were given by caregivers as to why ORS should be given to children with diarrhoea. Over half of the caregivers believed that ORS should be given to children with diarrhoea to decrease the stool output and 37.9% indicated that ORS helps to replace lost fluid or prevent dehydration. This finding corroborates with the findings of Ansari et al (2011) where majority of the respondents indicated that the role of ORS in diarrhoeal management is mostly to decrease the frequency of diarrhoea.

It also emerged from the study that among the available RHFs, most of the caregivers who gave some to the children, gave water followed by coconut water, porridge and sugar and salt solution. Some caregivers, however, had erroneous belief that fluids such as coke, yoghurt, coke mixed with paracetamol and coke mixed with salt were also forms of RHFs and therefore gave some of these fluids to their suffering children. This observation suggests significant knowledge deficit among the caregivers in RHFs and highlights the need for health education to be intensified on RHFs for the caregivers.

The findings of the study, again, indicate that the proportion of caregivers with secondary / higher level of education who were aware of RHFs and ORS were more in comparison with the caregivers with basic / lower level of education. Furthermore, the proportion of caregivers with secondary / higher level of education who used RHFs and ORS prior to the hospital visit was more in comparison with the caregivers with basic / lower level of education. However, the differences were not statistically significant. The test results were as follows: awareness of RHFs (X^2= 2.764, df= 1, $p > 0.05$); awareness of ORS (X^2= 0.000, df=1, $P > 0.05$); Use of RHFs (X^2= 1.866, df=1, $p > 0.05$); use of ORS (X^2= 0.079, df= 1, $p > 0.05$). These suggest that the caregivers‘ educational level had no relationship with awareness and use of RHFs and ORS. These findings vary from that of Kudlova (2010), which revealed positive

association between maternal educational level and their level of knowledge and use of ORS. However, they seem to confirm the earlier assertion made by Adimora et al (2011) that knowledge of treatment of childhood diarrhoea at home does not necessarily follow the social class lines. In their study, educational level was not a very essential factor in the knowledge of home management of childhood diarrhoea.

Regarding the correct use of ORS (that is, correct mixture of ORS, right frequency for administering ORS and duration of mixed ORS), the findings of the study were mixed. Only about one-fifth of the caregivers knew about the recommended volume of water for mixing a sachet of ORS (that is, 600 mls or two coke bottles of water to I sachet of ORS). Most of the caregivers (57.8%) erroneously believed that one sachet of ORS is mixed with 500 mls (small size of mineral bottle). However, for the frequency of administering ORS, a substantial proportion (81.9%) of the caregivers rightly indicated that ORS should be given after the passing of every loose stool or at frequent interval. Similarly, in the case of duration of mixed ORS, a sizeable proportion (86.2%) of the caregivers rightly indicated that mixed ORS should last for 24 hours or a day.

These findings concur with similar observation by Ansari et al (2011). From their study they found that none of the mothers out of a total of 130 mothers enrolled in the study could indicate all the four correct steps of ORS preparation and besides, many parents gave the wrong volume of ORS solution to their children during diarrhoea. This is further supported by the findings of Adimora et al (2011) and Uchendu et al (2008). Their studies also reveal that a significant number of children received ORS and SSS in which the salt and sugar were not properly mixed with right volume of water.

Furthermore, from the results of the current study, no significant difference was found in the knowledge about correct use of ORS between caregivers with higher level of education and

those with lower level of education ($X^2 = 2.508$, df=2, $p > 0.05$). This suggests that caregivers' educational level had no relationship with caregivers' level of knowledge in the correct use of ORS. This finding concurs with some earlier studies including of Adimora et al (2011) and Uchendu et al (2008), which have argued that maternal educational level does not confer any advantage on being able to correctly mix the ORT fluids.

The findings of the current study suggest that caregivers have challenge with the recommended volume of water to mix ORS as compare to how to administer the ORS. The challenge with the correct mixture of the ORS could be attributed to proliferation and use of bottled and sachet water in the country. In the past, beer bottle and coke bottle were the commonly mode of measuring the volume of water for the mixture of ORS. The MOH therefore recommended that mothers should use one beer bottle or two coke bottles of water in mixing of ORS. However, in recent times, most Ghanaians prefer the use of the bottled and sachet water to the normal pipe bone water. The bottled water comes in various volumes but it seems the 500 mls volumes are the most commonly used. This may account for the reason why majority of the caregivers in this current study ended up using 500 mls of water in mixing the ORS.

Another reason might be due to the convenient nature of using bottled water as compare to using the beer bottle. In using the beer bottle the caregiver has to search for one which might not be readily available at the incidence of the diarrhoea. The bottle also has to be washed well before using it. The whole process appear cumbersome to most modern Ghanaian caregivers and this poses a challenge to using the correct volume of water to mix the ORS. Perhaps it is time for the caregivers to be educated on other modes of measuring the volume of water for the ORS that will be convenient, acceptable, and easy to comply with by all caregivers irrespective

of their educational background since ORS mixed with wrong quantity of water could be ineffective and even unsafe for the child's health.

5.5 The use of other modes of treatment for diarrhoea at home

The WHO (2006) on the subject of implementing the new recommendations on the clinical management of diarrhoea, recommended ORS and fluid commonly available at home, breastfeeding, continued feeding, selective use of antibiotics, and providing zinc supplementation for 10 to 14 days for diarrhoeal management. Use of antibiotics is recommended only when appropriate, that is, in the presence of bloody diarrhoea or shigellosis and for anti-diarrhoeal drugs, healthcare providers are to abstain from administering them. This notwithstanding, the use of antibiotics and anti-diarrhoeal drugs for treatment of diarrhoea appears to be much popular among caregivers.

In the current study, as many as (71.6%) of the caregivers had given one or more medicines to their children prior to presentation at the hospital and about half of them gave anti diarrhoeal drugs while almost one-third of them gave antibiotics. Some of them gave other drugs including paracetamol, anti malaria, haematinics, metronidazole, dewormer etc. It is noteworthy to state only 9.6% of the caregivers gave their children zinc tablet. The source of most of the medicines was chemists/drug stores. Various reasons were assigned by the caregivers for giving the medicines to their children before seeking care at hospital. Most of the caregivers said they gave the medicine particularly the antibiotics and anti diarrhoea drugs to stop or reduce the diarrhoea and vomiting. Others explained that they gave the paracetamol, anti- malaria, metronidazole and dewormer to relieve the children of the fever and abdominal pain. Some, again, said they gave the haematinics to stimulate the children's appetite for food.

A possible explanation for the findings in the present study could be the inadequate knowledge on the part of the caregivers about the causes of diarrhoea and its management. They therefore resort to other forms of treatment which in their opinion might be able to manage the diarrhoea effectively. It may also be due to the perception of the caregivers that those medicines would be able to stop the diarrhoea faster than ORS. Another possible reason for the high use of the medicines particularly the antibiotics and anti-diarrhoeal drugs might be as a result of the easy access of the medicines over the counter.

Again, as some of the chemists or drugs stores do not have the services of a qualified pharmacist or a trained dispensary technician throughout the day, there is a high possibility that some of the caregivers might have fallen into the hands of untrained chemical shop attendants who might have limited knowledge about the effects of irrational use of drugs especially in children. These attendants might have influenced the caregivers in settling for the anti-diarrhoeal and other drugs instead of ORS and zinc. These emerging issues require a definite effort by MOH/GHS to intensify education against irrational use of drugs in the management of diarrhoea.

Regarding zinc tablet, the study revealed that even though 69% of the caregivers claimed they were aware about the tablet, as many as 62 % of them could not tell the use of the tablet. The finding of the study is consistent with the findings of Ogunrinde and Anigo (2012) who reported inadequate knowledge of the use of Zinc tablet in the management of diarrhoea among caregivers. The high level of awareness of the zinc tablet among the caregivers might possibly be due to the fact that it was recently launched in the country and has received a lot of media publicity in recent times. Thus, the memories of the drug might be still fresh with the caregivers.

On the other hand, the inability of most of the caregivers to explain the use of the zinc tablet might be due to fact that the information propelled in the media might not be in-depth enough for the caregivers to properly understand the use of the tablet. It is therefore imperative for the information on zinc tablet to be repackaged to enable the caregivers have adequate understanding and better appreciate the use of the tablet for management of diarrhoea. This may gratify the psychological needs of the caregivers who strongly believe that it is a must to give a drug for effective management of diarrhoea in children.

5.6 Caregivers healthcare seeking behaviour

The study established a significant difference in the duration of illness before seeking care at a health facility between caregivers with valid health insurance and those without valid health insurance ($U= 1250.000$, $N_1 = 58$, $N_2 = 58$, $P < 0.05$). This suggests that caregivers with valid health insurance were more likely to spend less number of days at home in the event of illness of their children as compared to those without valid or no insurance. This finding conforms to that of Page et al (2011) who found that the increase in health care seeking behaviour in the case of diarrhoea of children under 5 years of age in the Maradi region is as a result of the efficacy of recent health policies for children in Niger. They added the abolition of user fees for children under 5 years old in April 2007 had brought a positive impact on patient behaviour, and in particular on the delay before consultation and in the most vulnerable groups.

Furthermore, the findings of the current study reveal that enrolment in the NHIS was low among the caregivers. Despite its obvious benefits and regardless of it being free for children under 18 years, as many as half of the caregivers were without valid health insurance. This observation could be explained by the fact some of the caregivers cannot afford the

premium charged by insurance scheme because of financial constraint. Other reason could be that some of the caregivers might not be well informed about the whole insurance package and the benefits associated with it. Therefore they are not attracted to get enrolled in the scheme. This implies that the NHIA will need to ensure continuous education on health insurance and its associated benefit to the entire pubic to enhance its enrollment especially among caregivers with children under five.

Concerning reasons for the duration of illness prior to the hospital visit, it varied in proportion between caregivers with and without valid health insurance. In the case of those with valid health insurance over half of them claimed they waited at home because the condition of the children was not serious. Only 1.7% of the valid health insurance holder claimed they waited at home because they did not have money while 3.4% said they waited for their partners. On the contrary, only 34.5% of those without valid health insurance indicated they waited at home because the condition of the children was not serious while 25.8% indicated they started as a first aid to manage the diarrhoea at home. Almost a quarter of the non-health insurance holders indicated that they waited at home because they did not have money while 10.3% claimed they waited for their partners.

The findings of the current study support those from Sharkey et.al (2011) which cited that limited autonomy of caregivers in decision-making, financial constraints, lack of awareness of infant danger- sings, and identification of an externalizing cause of illness were important influences on healthcare-seeking during illnesses of infants. This is further supported by Biritwum et al (2004) who also indicated lack of money as the main reason given by the caregivers for not seeking medical attention for their children with severe diarrhoea. Again, the findings suggest that factors including the seriousness of illness and ability to pay during illness

play a key role in caregivers‘ decision to seek health care. Caregivers‘ inability to detect danger signs associated with diarrhoea coupled with their inability to pay may lead to delay in seeking medical attention. This may lead to preventable death thereby contributing to high infant mortality rate. It is therefore important for caregivers to have adequate knowledge on danger signs of diarrhoea in addition to enrolling in the NHIS to enable them seek early care at health facility to avert preventable deaths among children.

5.7 Limitations

The findings of this study although informative are also subject to some limitations. Quantitative research enhances generalization of the results when data are drawn from fairly large random samples. In the current study, however, the study institution was limited to only PML children‘s hospital. Representation and generalization of the study could have been maximized if caregivers from other hospitals were incorporated into the study. The researcher had to restrict the study population because of limited time and financial constraints.

It is also possible that the recognition of the researcher as a nurse by caregivers could have altered their responses to satisfy the researcher. This was, however, managed by informing caregivers that truthful responses were needed to ensure the data collected were valid and useful. Apart from these limitations, the study provides fascinating preliminary findings that deserve further exploration.

CHAPTER SIX

SUMMARY, IMPLICATION, RECOMMENDATION AND CONCLUSION

6.1 Summary

The study sought to assess pre-hospital management of diarrhoea and factors affecting it among caregivers with children under five at the PML Children Hospital in Accra. The study employed a quantitative cross-sectional design using a total of 120 purposively sampled caregivers with children under five presenting with diarrhoea at the PML Children Hospital. A questionnaire with 26 items with both open and close ended items was designed. This covered socio-demographic characteristics of the respondents, knowledge about diarrhoea, its causes and danger signs associated with it, awareness and use of ORS and RHFs, feeding practices during diarrhoeal episode, other mode of treatment which caregivers use during diarrhoeal episode and factors that affect caregiver‘s decision to seek health care. Data obtained was analysed using the SPSS version 16.0 statistical packed. Chi-square and Mann-Whitney tests were used to test the various components of the questionnaire to investigate the specific objectives and hypothesis.

The major findings of the study are summed up as follows:

- Almost all the caregivers who participated in the study rightly understood diarrhoea as frequent passing of ‘watery stool‘ (three or more times in a day) but their knowledge pertaining to the causes and dangers signs of diarrhoea was not satisfactory.
- Convincing evidence of relationship was established between caregivers‘ educational level and knowledge about causes of diarrhoea. However, no convincing evidence of relationship was established between caregivers‘ educational level and knowledge about danger signs of diarrhoea.

- The findings revealed a high rate of breastfeeding among mothers especially for children within the first six months of birth. However feeding practices among caregivers during diarrhoea episode was not encouraging as a high rate of diet restriction of children prior to the hospital was reported. This is a concern because dietary restriction of children during diarrhoea may compromise their health.
- The findings revealed a wide gap between awareness and use of ORS among the caregivers. Even though the awareness level of ORS among the caregivers were substantially high, the actual number of caregivers who gave ORS to their children prior to the hospital was relatively very low. In the case of RHFs, the study found that both the level of awareness and use among the caregivers were very low compared to ORS.
- The level of awareness and use of RHFs and ORS among caregivers with higher level of education was comparable with those with lower level of education. Thus, the evidence available did not support any relationship between the caregivers‘ educational level and awareness and use of RHFs and ORS. Similarly, the level of knowledge in the correct use of ORS among caregivers with higher level of education was comparable with those with lower level of education.
- It emerged from the study that most of the caregivers employed other remedies including the use of antibiotics and anti-diarrhoea drugs to treat diarrhoea instead of ORS, RHFs and zinc. Chemists / drugs stores were top among the sources of medicines resorted to by caregivers for treatment of diarrhoea.
- Convincing evidence of a relationship was established between health insurance and duration of diarrhoea illness at home before hospital visit. The evidence available was supportive of the view that caregivers‘ with valid health insurance are more likely to

spend less number of days at home in the event of illness among their children as compare to those without valid or no insurance.

6.2 Implication for Nursing

The outcome of the study has implications for nursing and these can be viewed in terms of four areas of nursing: management, research, education and practice.

6.2.1 Nursing management

Nurse Managers in the various hospitals should ensure that there are planned, relevant and appropriate teaching protocols for nurses for educating mothers on diarrhoea and its home management as well as other common childhood illness. They should also ensure continuous in-service training of nurses on management of common childhood illness such as diarrhoea so that they will always be abreast with current trend of management of these diseases.

6.2.2 Nursing research

Further research on pre-hospital management of diarrhoea among caregivers need to be carried out at multi-sites with larger sample size to confirm the findings of current study. The need for an additional comprehensive community based survey cannot be over-emphasised but this was not possible in the current study because of limited time and financial constraints.

6.2.3 Nursing education

The finding will inform nurse educators on the knowledge gap on home management of diarrhoea among caregivers. This will enable them to make the necessary amendments and restructuring in the educational curriculum for nurses so that they can meet the informational

needs of caregivers. This will also help equip nurses with relevant knowledge and improve their health informational dissemination skills to help bridged the knowledge gap on home management of diarrhoea and child welfare issues.

6.2.4 Nursing practice

Nurses by virtue of their role as health care professionals' and clients advocate, play a pivotal role in influencing behaviour modification among the people they come into contact with in course of their work. Nurses must strive to empower themselves through continuous and periodic upgrading in courses on current trend of management of disease conditions including diarrhoeal diseases and quality client care in general. Community health nurses should collaborate with the opinion leaders in the various communities and intensify health education on diarrhoeal diseases to reduce diarrhoea child mortality.

6.3 Recommendation

- The MOH / GHS should step up educational programmes on pre-hospital management of diarrhoea. This should involve:
    - The use of mass media, community durbars, drama groups and other community-based education to sensitise the public and the community on diarrhoea particularly causes and danger signs of diarrhoea, the use of RHFs, ORS and zinc tablets, the need for continued feeding during diarrhoea and recognising when to seek additional medical care.
    - Continuous sensitisation of individual caregivers by health providers on home-based management of diarrhoea, especially during child welfare clinics and home visits. The sensitisation should focus on vital information on diarrhoea contained in the weighing

book, which includes the causes and danger signs associated with diarrhoea and how to manage it at home. Again the sensitisation should involve practical demonstration of how to prepare ORS correctly.

- Developing appropriate educational and training materials including posters to transmit priority messages on the causes and danger signs of diarrhoea, preparation and administration of ORT solutions, the importance of RHFs and continued feeding and the need for referral if the child's condition worsens.
- Collaborating with Ministry of Education / Ghana Education Service to incorporate lessons on the causes and danger signs of diarrhoea and its home management in primary schools.

- The Pharmacy Council should streamline and monitor the activities of chemists /drug stores particularly with regard to the sale of drugs such as antibiotics and anti-diarrhoeal-drugs without prescription. The Council should also champion rational use of drug in children especially in diarrhoea management. Separate guidelines for treatment of diarrhoea in children should be prepared for the chemists /drug store attendants and ORS packets should be made available in adequate supply at the drugs stores and throughout the entire health system.
- The MOH/GHS should come out with an appropriate, ‘universally’ available measuring container to help caregivers to mix the ORS with the right volume of water.
- The NHIA should step up their education programmes on the benefits of the health insurance package among the citizenry especially the lower social class and those in the informal sector in order to increase their enrollment.

6.4 Suggestion for future research

In view of the fact that this research was limited to only one hospital in Accra, future research should examine similar data in more health facilities in the Greater Accra and other regions to expand the evidence base to enhance pre-hospital management of diarrhoea.

6.5 Conclusion

Proper home management can reduce morbidity and mortality due to diarrhoea. Factors of particular importance include caregivers‘ knowledge about causes of diarrhoea and the associated dangers signs, prevention of dehydration during diarrhoeal episodes through the use of RHFs and ORS, support of nutritional status through the continuation of an adequate diet, avoidance of harmful practices and early referrals for treatment. The current study reveals inadequate knowledge about the causes and dangers signs associated with diarrhoea among caregivers even though they appear to rightly describe diarrhoea as frequent passing of ‘watery stool‘ (three or more times in a day). The findings of the study also showed dietary restrictions during the diarrhoea episode, low use of both RHFs and ORS but high use of other remedies such as antibiotics and anti-diarrhoea.

The study further revealed that knowledge about danger signs of diarrhoea and the correct use of ORS as well as the level of awareness and use of RHFs and ORS among caregivers with higher level of education were comparable with those with lower level of education. A positive relationship was however established between caregivers‘ educational level and knowledge about causes of diarrhoea as well as health insurance and duration of diarrhoea illness at home before hospital visit. It is envisaged that continuous health education will help improve pre-hospital management of diarrhoea.

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APPENDICES

APPENDIX A

PARTICIPANT INFORMATION SHEET

Title: Pre Hospital management of diarrhoea among caregivers with children under five at the Princess Marie Louise Children Hospital, Accra

Principal Investigator: Charity Asantewaa Acheampong, School of Nursing, College of Health Science, University of Ghana, Legon P.O Box LG 43 Legon.

General Information about Research

This study seeks to assess home management of diarrhoea among caregivers with children under five prior to seeking medical attention at the hospital. The study will generate relevant information on the challenges caregiver face in home management of diarrhoea. This is envisaged to contribute to improving home management of diarrhoea.

You have been selected for this study because you are a caregiver with a child under five presenting with diarrhoea. Please, you have the right to decide whether you want to take part in the study or not. You will be recruited into the study after your child has been attended to at the ORT corner and is waiting at the OPD to be seen at the consulting room by a doctor. Your child will be in a stable condition or out of danger before the interview commence. We will also liaise with the nurses to ensure that your child is attended to promptly by a doctor after the interview.

If you agree to be part of the study, you will be given a consent form and you will have to give your consent by signing the form, after which you will answer questions from the questionnaire. The questions will centre on your knowledge on diarrhoea and how you managed your child's/ ward's diarrhoea at home before coming to the hospital. The questions will be in the form of face to face interview. The questions will be read out to you and you are at liberty to answer what you can and leave any question you are not able to answer. The answers you give will be recorded on the questionnaire. The interview will last between 30 - 40 minutes

Possible Risks and Discomforts

There is no risk associated in taking part in the study

Possible Benefits

It is hoped that this study will come out with findings, which will contribute to the process of finding best ways of strengthening home-based management of diarrhoea as part of the national strategy to reduce diarrhoea morbidity and mortality among children in Ghana.

Confidentiality

The venue for the interview will be such that nobody will hear what you say .Your name will not be recorded on the questionnaire form but only on the agreement form which only my supervisors will have access to it. However you will be given an ID number which will be recorded on the questionnaire for the purpose of coding of information. You will not be named in any reports and all information about you will be protected in the best of my ability.

Compensation

There would be no monetary gain for participating in the study: however your effort will be much appreciated.

Voluntary Participation and Right to Leave the Research

You have the free will to decide whether you want to take part in the study or not. If you agree, you will be given a consent form and you will have to give your consent by signing the consent form. In case you cannot read the consent form yourself, somebody can read and explain it to you and sign the consent form as a witness. This will be done after the procedures involved in the study have been explained to you in his presence. You are free to opt out of the study at any time if you wish. Your refusal to participate in the study will not affect your child's care in this hospital.

Contacts for Additional Information

1. Mrs. Comfort Kafui Afram, Mphil, BA, Dip, School of Nursing, College of Health Science University of Ghana Legon P.O Box LG 43 Legon.
   E mail: aoakk@yahoo.com
   Tel: 0278153024

2. Dr (Mrs.) Maame Yaa Nyarko, FWACP, MBchB, Head of clinical Services, PML Children Hospital, P.O Box GP 122 Accra
   Email meeyaa@yahoo.com
   Tel: 0244018888

Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.mimcom.org or HBaidoo@noguchi.mimcom.org .

APPENDIX B

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title ***(Pre hospital management of diarrhoea among caregivers with children under five at the PML Children Hospital)*** has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

_____ _____

Date Name and signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

_____ _____

Date Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

_____ _____

Date Name Signature of person who obtained consent

APPENDIX C

DATA COLLECTION INSTRUMENTS

TOPIC: PRE-HOSPITAL MANAGEMENT OF DIARRHOEA AMONG CAREGIVERS WITH CHILDREN UNDER FIVE AT PML HOSPITAL

A. SOCIO DEMOGRAPHIC INFORMATION

1. ID No.----------

2. Age of caregiver

15-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55 above ☐

3. Gender of caregiver

☐ Male ☐ Female

4. What is the highest level of education you have completed?

☐ No formal education
☐ Primary
☐ JHS/Middle School
☐ Secondary / SHS
☐ Vocational/Technical/Commercial
☐ Post Sec
☐ Tertiary
☐ Others, please specify----------

5. Marital Status

☐ Married
☐ Separated/Divorced
☐ Single
☐ Co-habiting
☐ Widowed

6. What is your Occupation/Profession?

- ☐ Civil Servant/Public servant
- ☐ Trader
- ☐ Trades- hairdressing, seamstress, carpentry etc
- ☐ Unemployed
- ☐ Others, please Specify……

7. Relationship of caregiver to client

- ☐ Mother
- ☐ Father
- ☐ Sibling
- ☐ Grandmother
- ☐ Grandfather
- ☐ Other, Specify……..

8. What is the age of your child?

- ☐ 0-6 months
- ☐ 7- 12 months
- ☐ 13-18 months
- ☐ 19- 24 months
- ☐ 25-30 months
- ☐ 31-36 months
- ☐ 37-42 months
- ☐ 43- 48 months

B. KNOWLEDGE ABOUT CAUSES OF DIARRHOEA AND THE ASSOCIATED DANGER SIGNS

9. What do you understand by diarrhoea?

- ☐ Frequent passing of watery stool (3 or more times)
- ☐ Frequent passing of non-watery stool
- ☐ Blood in stools
- ☐ Greenish stools
- ☐ No idea
- ☐ Phlegm's (mucus) in stool)
- ☐ Others, please specify ……

10. What do you think are the causes of diarrhoea? (Tick as many as possible)

- ☐ Infection
- ☐ Worm infection
- ☐ Food poisoning/Contaminated Food
- ☐ Contaminated water
- ☐ Teething
- ☐ No idea
- ☐ Others Please Specify…….

11. What are some of the danger signs associated with diarrhoea? (Tick as many as possible)

- ☐ Becoming weak or lethargic
- ☐ Repeated vomiting/ vomiting everything
- ☐ Fever and blood in stool
- ☐ Marked thirst of water
- ☐ Poor feeding
- ☐ Reduced urine output
- ☐ Frequent passing of diarrhoea
- ☐ Others, please specify ……

C. FEEDING PRACTICE

12. What do you feed your child on?

- ☐ Breast milk only
- ☐ Breast milk + Infant formula
- ☐ Complementary feeding only
- ☐ Complementary feeding plus breast milk
- ☐ Normal family diet
- ☐ Others, Please specify……

13 (a) During the diarrhoea illness, did the child eat-----

- ☐ About the same?
- ☐ More than usual?
- ☐ Much less?
- ☐ Somewhat less?

(b) Any reason for the answer given

---

14 (a) During the diarrhoea illness, did the child drink-----

- ☐ About the same?
- ☐ More than usual?
- ☐ Much less
- ☐ Somewhat less

(b) Any reason for the answer given

D. AWARENESS AND USE OF ORAL REHYDRATION SALT (ORS) AND RECOMMENDED HOME FLUIDS (RHFs)

15. What available recommended home-made fluid / home base oral rehydration fluid can be given to a child with diarrhoea? (Tick as many as many as possible)

- ☐ Coconut water
- ☐ Sugar and salt solution
- ☐ Water
- ☐ Mashed kenkey
- ☐ Rice water
- ☐ Other, please specify----------

☐ Porridge

16 (a) Was your child given any home-made fluid before coming to the hospital?

☐ Yes ☐ No

(b) If yes, what home-made fluid did you give to your child before coming to the hospital? (Tick as many as possible)

☐ Coconut water
☐ Mashed kenkey
☐ Sugar and salt solution
☐ Rice water
☐ Water
☐ Other, please specify----------
☐ Porridge

17 (a) Have you heard about a fluid made from a special packet called (*ORS*)?

☐ Yes ☐ No

(b) If yes, was your child given some before coming to the hospital?

☐ Yes ☐ No

18. Preparation, storage and how long mixed ORS lasts

(a) How is ORS prepared?

☐ 1 sachet of ORS- 300 mls (1 coke bottle) of water1
☐ 1 sachet of ORS- 500 mls (1 small size of mineral bottle) of water
☐ 1 sachet of ORS- 600 mls (1 beer bottle) of water
☐ 1 sachet of ORS- 750 mls (1 medium size of mineral bottle) of water
☐ 1 sachet of ORS- 1000 mls (1 litre) of water
☐ 1 sachet of ORS- 1500mls (1.5 litres or large size of mineral bottle) of water

(b) How often should ORS be given?

☐ Once a day
☐ 2-3 times a day
☐ 4-5 times a day
☐ 6 & above times a day

☐ After the passing of very loose stool

☐ No idea

(c) How long should the mixed ORS last?

☐ 24 hrs (I day)

☐ 48 hrs (2days)

☐ 72 hrs (3days)

☐ 96 hrs (4days)

☐ Others please specify ……

19. Mention the reason (s) why ORS or RHF is given to children having diarrhoea

☐ To increase the diarrhoea ☐ No idea

☐ To decrease the diarrhoea ☐ Others, please specify……..

☐ To prevent dehydration

E. OTHER MODE OF TREATMENT GIVEN

20. Was your child given medicine / other treatment before coming to the hospital?

☐ Yes ☐ No

21 (a) If yes, please indicate the type of treatment given?

☐ Antibiotics ☐ Syrup paracetamol

☐ Anti diarrhoea ☐ Others, please specify.

☐ Herbal preparation

(b)Why did you give that particular treatment? ----------

---

22. Where did you get the treatment from?

☐ Nearby chemist /drug store ☐ Community health worker

☐ Left over of prescribed drugs ☐ Drug peddlers

☐ From friend or family member ☐ Others, please specify

23. (a) Have you heard about Zinc Tablet?

☐ Yes ☐ No

(b) What is the use(s) of it……

F. HEALTH CARE SEEKING BEHAVIOR

24. Do you have a valid health insurance (Not expired)?

☐ Yes ☐ No

25. How long did you stay at home before coming to the hospital?

☐ 1 -2days ☐ 3-4 days

☐ 5-6 days ☐ 7days and above.

26. Why did you stay home for that long?

☐ Started home management

☐ Not having money

☐ Waiting for life partner

☐ Condition was not serious

☐ Others, Please specify……

Thank you

APPENDIX D

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979
A Constituent of the College of Health Sciences
University of Ghana

INSTITUTIONAL REVIEW BOARD

Phone: +233-302-916438 (Direct)
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E-mail: nirb@noguchi.mimcom.org
Telex No: 2556 UGL GH

Post Office Box LG 581
Legon, Accra
Ghana

My Ref. No: DF.22
Your Ref. No:

7th March, 2013

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 **IRB 00001276**

NMIMR-IRB CPN 061/12-13 **IORG 0000908**

On 7th March, 2013, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:

TITLE OF PROTOCOL : **Pre-Hospital management of diarrhoea among caregivers with children under five at the Princess Marie Louise Hospital, Accra**

PRINCIPAL INVESTIGATOR : **CharityAsantewaa Acheampong, MSc. Student**

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 6th March, 2014. You are to submit annual reports for continuing review.

Signature of Chairman: for .....
Rev. Dr. Samuel Ayete-Nyampong
(NMIMR – IRB, Chairman)

cc: Professor Kwadwo Koram
Director, Noguchi Memorial Institute
for Medical Research, University of Ghana, Legon

APPENDIX E

GHANA HEALTH SERVICE ETHICAL REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

My Ref. :GHS-ERC: 3
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: nanatuesdaykad@yahoo.com

12th June, 2013

Dr. Charity Asantewaa Acheampong
School of Nursing
University of Ghana
Accra

ETHICAL APPROVAL - ID NO: GHS-ERC: 14/05/13

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol titled:

"Pre-Hospital Management of Diarrhoea among Care givers with children under five"

This approval requires that you inform the Ethical Review Committee (ERC) when the study begins and provide Mid-term reports of the study to the Ethical Review Committee (ERC) for continuous review. The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Please note that any modification without ERC approval is rendered invalid.

You are also required to report all serious adverse events related to this study to the ERC within seven days verbally and fourteen days in writing.

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per approved protocol. You are also to inform the ERC and your sponsor before any publication of the research findings.

Please always quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC VICE-CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

APPENDIX F

SCHOOL OF NURSING
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA
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P.O. Box LG.43
LEGON, GHANA

April 17, 2013

The Medical Superintendent,
P.M.L. Children's Hospital
Accra

LETTER OF INTRODUCTION
MSc. IN NURSING STUDENT

I write to introduce to you Ms. Charity Asantewaa Achemapong, student of Master of Science in Nursing in School of Nursing, College of Health Sciences, University of Ghana, Legon. As part of her programme in the University, she has chosen to conduct research and collect data at your facility for her thesis on the topic" Pre-Hospital Management of Diarrhoea Among Caregivers with Children Under Five at Princess Marie Louis Hospital, Accra".

It would be appreciated if you could give her the necessary assistance.

Thank you.

Yours faithfully,

Mrs. Comfort Affram
Supervisor

APPENDIX G

Cross-tabulation and chi-square test: Respondents' educational level vs. knowledge of danger signs of diarrhoea

Knowledge of causes of diarrhoea * Educational level of caregivers: Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Knowledge of causes of diarrhoea	adequate knowledge	Count	5	14	19
		Expected Count	13.3	5.7	19.0
		% within Knowledge of causes of diarrhea	26.3%	73.7%	100.0%
		% within Educational level of caregivers	6.2%	40.0%	16.4%
		% of Total	4.3%	12.1%	16.4%
	Some knowledge	Count	48	19	67
		Expected Count	46.8	20.2	67.0
		% within Knowledge of causes of diarrhea	71.6%	28.4%	100.0%
		% within Educational level of caregivers	59.3%	54.3%	57.8%
		% of Total	41.4%	16.4%	57.8%
	No knowledge	Count	28	2	30
		Expected Count	20.9	9.1	30.0
		% within Knowledge of causes of diarrhea	93.3%	6.7%	100.0%
		% within Educational level of caregivers	34.6%	5.7%	25.9%
		% of Total	24.1%	1.7%	25.9%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Knowledge of causes of diarrhea	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Knowledge of causes of diarrhoea * Educational level of caregivers: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.046[a]	2	.000
Likelihood Ratio	25.556	2	.000
Linear-by-Linear Association	23.026	1	.000
N of Valid Cases	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.73.

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 25.046 is associated with a significant level of 0.000 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.000 is smaller than the apha value of 0.05, so it can be concluded that the result is significant.

APPENDIX H

Cross-tabulation and chi-square test: Respondents' educational level vs. knowledge of danger signs of diarrhoea

Knowledge about danger signs of diarrhoea * Educational level of caregivers Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Knowledge about danger signs of diarrhoea	adequate knowledge	Count	16	8	24
		Expected Count	16.8	7.2	24.0
		% within Knowledge about danger signs of diarrhea	66.7%	33.3%	100.0%
		% within Educational level of caregivers	19.8%	22.9%	20.7%
		% of Total	13.8%	6.9%	20.7%
	Some knowledge	Count	55	17	72
		Expected Count	50.3	21.7	72.0
		% within Knowledge about danger signs of diarrhea	76.4%	23.6%	100.0%
		% within Educational level of caregivers	67.9%	48.6%	62.1%
		% of Total	47.4%	14.7%	62.1%
	No knowledge	Count	10	10	20
		Expected Count	14.0	6.0	20.0
		% within Knowledge about danger signs of diarrhea	50.0%	50.0%	100.0%
		% within Educational level of caregivers	12.3%	28.6%	17.2%
		% of Total	8.6%	8.6%	17.2%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Knowledge about danger signs of diarrhea	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.317[a]	2	.070
Likelihood Ratio	5.075	2	.079
Linear-by-Linear Association	1.103	1	.294
N of Valid Cases	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.03.

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 5.317 is associated with a significant level of 0.070 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.070 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX I

Cross-tabulation and chi-square test: Respondents' education vs. awareness of RHFs

Awareness of RHFs * Educational level of caregivers: Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Awareness of RHFs	Yes	Count	20	14	34
		Expected Count	23.7	10.3	34.0
		% within Awareness of RHFs	58.8%	41.2%	100.0%
		% within Educational level of caregivers	24.7%	40.0%	29.3%
		% of Total	17.2%	12.1%	29.3%
	No	Count	61	21	82
		Expected Count	57.3	24.7	82.0
		% within Awareness of RHFs	74.4%	25.6%	100.0%
		% within Educational level of caregivers	75.3%	60.0%	70.7%
		% of Total	52.6%	18.1%	70.7%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Awareness of RHFs	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Awareness of RHFs * Educational level of caregivers

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.764[a]	1	.096		
Continuity Correction[b]	2.075	1	.150		
Likelihood Ratio	2.683	1	.101		
Fisher's Exact Test				.121	.076
Linear-by-Linear Association	2.741	1	.098		
N of Valid Cases[b]	116				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.26.

b. Computed only for a 2x2 table

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 2.764 is associated with a significant level of 0.096 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.096 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX J

Cross-tabulation and chi-square test: Respondents' education vs. awareness of ORS

Awareness of ORS * Educational level of caregivers: Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Whether heard about ORS	Yes	Count	80	35	115
		Expected Count	80.3	34.7	115.0
		% within Whether heard about ORS	69.6%	30.4%	100.0%
		% within Educational level of caregivers	98.8%	100.0%	99.1%
		% of Total	69.0%	30.2%	99.1%
	No	Count	1	0	1
		Expected Count	.7	.3	1.0
		% within Whether heard about ORS	100.0%	.0%	100.0%
		% within Educational level of caregivers	1.2%	.0%	.9%
		% of Total	.9%	.0%	.9%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Whether heard about ORS	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Awareness of ORS * Educational level of caregivers

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.436[a]	1	.509		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.722	1	.395		
Fisher's Exact Test				1.000	.698
Linear-by-Linear Association	.432	1	.511		
N of Valid Cases[b]	116				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .30.

b. Computed only for a 2x2 table

From the result of the Chi-Square Tests, the corrected value, which is 0.000 is associated with a significant level of 1.000 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the Sig. value needs to be 0.05 or smaller. In this case, the value of 1.000 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX K

Cross-tabulation and chi-square test: Respondents' educational level vs. use of RHFs

Use of RHFs by caregivers * Educational level of caregivers: Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Whether home-made fluid was given prior to the hospital visit	Yes	Count	16	11	27
		Expected Count	18.9	8.1	27.0
		% within Whether home-made fluid was given before hospital	59.3%	40.7%	100.0%
		% within Educational level of caregivers	19.8%	31.4%	23.3%
		% of Total	13.8%	9.5%	23.3%
	No	Count	65	24	89
		Expected Count	62.1	26.9	89.0
		% within Whether home-made fluid was given before hospital	73.0%	27.0%	100.0%
		% within Educational level of caregivers	80.2%	68.6%	76.7%
		% of Total	56.0%	20.7%	76.7%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Whether home-made fluid was given before hospital	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Use of RHFs by caregivers * Educational level of caregivers

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.866[a]	1	.172		
Continuity Correction[b]	1.269	1	.260		
Likelihood Ratio	1.799	1	.180		
Fisher's Exact Test				.231	.131
Linear-by-Linear Association	1.849	1	.174		
N of Valid Cases[b]	116				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.15.

b. Computed only for a 2x2 table

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 1.866 is associated with a significant level of 0.172 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.172 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX L

Cross-tabulation and chi-square test: Respondents' educational level vs. use of ORS

Use of ORS by caregivers * Educational level of caregivers: Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Whether ORS was given prior to the hospital visit	Yes	Count	44	20	64
		Expected Count	44.7	19.3	64.0
		% within Whether ORS was given before hospital	68.8%	31.2%	100.0%
		% within Educational level of caregivers	54.3%	57.1%	55.2%
		% of Total	37.9%	17.2%	55.2%
	No	Count	37	15	52
		Expected Count	36.3	15.7	52.0
		% within Whether ORS was given before hospital	71.2%	28.8%	100.0%
		% within Educational level of caregivers	45.7%	42.9%	44.8%
		% of Total	31.9%	12.9%	44.8%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Whether ORS was given before hospital	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Use of ORS by caregivers * Educational level of caregivers

Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.079[a]	1	.779		
Continuity Correction[b]	.006	1	.939		
Likelihood Ratio	.079	1	.779		
Fisher's Exact Test				.840	.470
Linear-by-Linear Association	.078	1	.780		
N of Valid Cases[b]	116				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.69.

b. Computed only for a 2x2 table

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 0.079 is associated with a significant level of 0.779 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.779 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX M

Cross-tabulation and chi-square test: Respondents' education vs. correct use of ORS

Knowledge in the correct use of ORS * Educational level of caregivers Cross-tabulation

			Educational level of caregivers		
			Basic or lower level of education	Secondary or higher level of education	Total
Knowledge in the correct use of ORS	adequate knowledge	Count	12	7	19
		Expected Count	13.3	5.7	19.0
		% within Knowledge in the correct use of ORS	63.2%	36.8%	100.0%
		% within Educational level of caregivers	14.8%	20.0%	16.4%
		% of Total	10.3%	6.0%	16.4%
	Some knowledge	Count	52	17	69
		Expected Count	48.2	20.8	69.0
		% within Knowledge in the correct use of ORS	75.4%	24.6%	100.0%
		% within Educational level of caregivers	64.2%	48.6%	59.5%
		% of Total	44.8%	14.7%	59.5%
	No knowledge	Count	17	11	28
		Expected Count	19.6	8.4	28.0
		% within Knowledge in the correct use of ORS	60.7%	39.3%	100.0%
		% within Educational level of caregivers	21.0%	31.4%	24.1%
		% of Total	14.7%	9.5%	24.1%
Total		Count	81	35	116
		Expected Count	81.0	35.0	116.0
		% within Knowledge in the correct use of ORS	69.8%	30.2%	100.0%
		% within Educational level of caregivers	100.0%	100.0%	100.0%
		% of Total	69.8%	30.2%	100.0%

Knowledge in the correct use of ORS * Educational level of caregivers

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.508[a]	2	.285
Likelihood Ratio	2.481	2	.289
Linear-by-Linear Association	.168	1	.682
N of Valid Cases	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.73.

Note: From the result of the Chi-Square Tests, the Pearson Chi-Square which is 2.508 is associated with a significant level of 0.285 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.285 is greater than the apha value of 0.05, so it can be concluded that the result is not significant.

APPENDIX N

Mann Whitney test: Relationship between health insurance and duration of illness

Mann-Whitney Test

Ranks

	Whether have valid health insurance	N	Mean Rank	Sum of Ranks
Duration at home before presenting at hospital	Yes	58	51.05	2961.00
	No	58	65.95	3825.00
	Total	116		

Test Statistics[a]

	Duration at home before presenting at hospital
Mann-Whitney U	1250.000
Wilcoxon W	2961.000
Z	-2.521
Asymp. Sig. (2-tailed)	.012

a. Grouping Variable: Whether have valid health insurance

Note: From the test result, the Mann-Whitney U, which is 1250.000 is associated with a significant level of 0.012 (as presented in the column labeled Asymp. Sig [2-sided]). To be significant the P-value needs to be 0.05 or smaller. In this case, the value of 0.012 is smaller than the apha value of 0.05, so it can be concluded that the result is significant.