KNOWLEDGE AND USE OF ORAL REHYDRATION THERAPY AMONG MOTHERS OF UNDER-FIVE CHILDREN IN ODOGBO ARMY BARRACKS, IBADAN, NIGERIA

BY

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DEDICATION

This dissertation is dedicated to the Glory of Almighty God, for His blessing and mercy upon me and my family, for his untiring effort before and during the course of the programme.

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ABSTRACT

Diarrhoeal diseases constitute a major cause of morbidity and mortality among under-five children in Nigeria. The knowledge and use of home therapies to manage diarrhoea using Oral Rehydration Therapy (ORT) with special reference to Sugar-Salt-Solution (SSS) are on the decline in recent times. However, knowledge and self-efficacy of nursing mothers in Nigerian army barracks relating to the use of ORT have not been fully studied. The study was designed to assess the knowledge of diarrhoea and ORT and identify diarrhoea management practices involving use of SSS among mothers of under-five children in Odogbo army barracks, Ibadan.

A two-stage random sampling technique was used to select 403 mothers in Odogbo army barracks. A validated semi-structured questionnaire was used for data collection. The questionnaire included an 18-point diarrhoea knowledge scale and an 11-point ORT/SSS knowledge scale. Diarrhea knowledge scores of 0-8, 9-13 and 14-18 were rated as poor, fair and good while the ORT/SSS knowledge scores of 0-4, 5-7 and 8-11 were considered poor, fair and good respectively. Data were analyzed using descriptive statistics and Chi-square with level of significance set at 0.05.

The mean age of respondents was 29.8 ± 5.5 years, most (99.3%) were married and 63.0% were Christians. The occupations of respondents included petty-trading (43.0%), full-time "housewives" (35.7%) and artisans (12.9%). Most respondents (98.0%) were aware of ORT, 95.0% correctly stated the composition of SSS and 43.9% were able to state the correct proportions of sugar, salt, and water in SSS. Respondents' sources of information about ORT included health personnel (78.7%), relatives (11.4%) and television (6.0%). The listed causes of diarrhoea included teething (51.7%) and dirty environment (29.0%). Diarrhoea was perceived by 46.0% to be a serious health condition. Respondents' mean knowledge score on diarrhoea was 13.3 ± 2.4 while the mean knowledge score on ORT/SSS was 7.6 ± 1.8. The mean knowledge score on diarrhoea among mothers aged < 25 years was 12.3 ± 2.8 while the mean score among those aged ≥ 25 years was 13.5 ± 2.3 with no significant difference. Mean knowledge

score on ORT/SSS among mothers aged <25years was 6.9 ± 2.3 while the mean score among those aged ≥25years was 7.7 ± 1.6 with no significant difference. Majority (79.9%) of respondents reported that, children had diarrhoea within the three months preceding the study and home treatment given included use of ORT (49.5%), other orthodox medicines (22.6%) and native medicine (3.7%). Seventy percent of respondents stated that they could prepare SSS, but 72.7% preferred taking children with diarrhoea to the hospital instead of using SSS. Forty-nine percent of the respondents were of the view that cleanliness of the environment was one of the preventive measures against childhood diarrhoea.

Knowledge about diarrhoea diseases and oral rehydration therapy was high among respondents, but their use of oral rehydration was low. Training, public enlightenment and social marketing strategies are needed to promote the use of oral rehydration therapy among nursing mothers.

Key words Diarrhoeal diseases, Nursing mothers, Oral rehydration therapy.

Word count: 485

CERTIFICATION

I certify that this study was carried out by Mary Oluwatoyin AGBOLADE in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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ACRONYMS

AIDS	Acquired Immuno-Deficiency Syndrome
EBF	Exclusive Breast Feeding
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IMR	Infant Mortality Ratio
NDHS	Nigerian Demographic and Health Survey
SSS	Salt Sugar Solution
ORS	Oral Rehydration Salt
ORT	Oral Rehydration Therapy
UNICEF	United Nation Children Emergency Fund
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1: Background

The oral administration of fluids in order to treat dehydration associated with diarrhoea is known as oral rehydration therapy (ORT). According to the definition of the World Health Organization (WHO) in 1993, ORT includes oral rehydration salt (ORS) solution, recommended home fluids (RHF) and breastfeeding. Diarrhoeal diseases remain the second leading cause of death among children under-five globally, nearly one in five child deaths, about 1.5million each year, it kills more young children than AIDS, malaria and measles combined. (UNICEF/WHO, 2009). On the average, children below three years of age in developing countries experience three episodes of diarrhoea each year. Eight out of ten of these deaths occur in the first two years of life. In many countries diarrhoea, including cholera is also an important cause of morbidity among older children and adults (WHO, 2005).

Although the total number of deaths globally from diarrheal diseases remains high, the overall mortality rate has steadily declined over the last few decades (Kosek, Bern and Guerant, 2003). This decline especially in developing countries is largely due to the use of early and appropriate oral rehydration therapy (ORT), as well as improved nutrition and water sanitation (Victora, Bryce, Fontaine, Monasch. 2000). The early use of ORT at home in children with diarrhoea decreases the number of patient visits and hospitalizations, and over all medical costs (Duggan, Lasche and MacCarty, 1999). In Nigeria, 66% of mothers know about ORS packets or ORS pre-packaged liquids to treat diarrhoea (NPC, 2009).

Diarrhoea diseases are some of the most prevalent diseases and most frequent causes of death in childhood around the world, especially in less developed and developing countries, including Turkey. The main cause of death in children with diarrhoea is dehydration. If dehydration is prevented, the high fatality rate of diseases with diarrhoea can be lowered. Great success has been achieved using ORT, which has been given to prevent dehydration in children with diarrhoea. Its use has increased a lot recently. It has been reported that the

deaths of approximately one million children have been prevented each year by the use of ORT in recent years (Ali, Servet and Birgül, 1998).

Diarrhoea is caused by a variety of bacterial, viral, and parasitic enteropathogens. Transmission occurs through the fecal-oral route as a result of direct person-to-person contact (such as hand-to-mouth contact) and exposure to contaminated food, water, and objects. Avoidance of contaminated water and attention to hygienic practices, such as sanitary waste disposal, correct food handling techniques, and washing one's hands, can help prevent illness. In addition, infants may derive some protection from breastfeeding, because breast milk contains specific rotavirus-neutralizing antibodies (Huttly, Morris and Pisani, 1997).

Many diarrhoeal deaths are caused by dehydration. An important development has been the discovery that dehydration from acute diarrhoea of any aetiology and at any age, except when it is severe, can be safely and effectively treated by the simple method of oral rehydration using a single fluid (UNICEF, 2009). Glucose and several salts in a mixture known as Oral Rehydration Salts (ORS) are dissolved in water to form ORS solution. ORS solution is absorbed in the small intestine even during copious diarrhoea, thus replacing the water and electrolytes lost in the faeces. ORS solution and other fluids may also be used as home treatment to prevent dehydration. After 20 years of research, an improved ORS solution has been developed. It is called reduced (low) osmolarity ORS solution, this new ORS solution reduces by 33% the need for supplemental IV fluid therapy after initial rehydration when compared to the previous standard World Health Organisation (WHO) ORS solution. The new ORS solution also reduces the incidence of vomiting by 30% and stool volume by 20%. This new reduced (low) osmolarity ORS solution, containing 75 mEq/l of sodium and 75 mmol/l of glucose, is now the ORS formulation officially recommended by WHO and United Nation International Children Emergency Fund (UNICEF, 2009).

Oral rehydration therapy (ORT) includes rehydration and maintenance fluids with oral rehydration solutions (ORS), combined with continued age-appropriate nutrition. Although ORT has been instrumental in improving health outcomes among children in developing countries, its use has lagged behind in the United States. This report provides a review of the historical background and physiologic basis for using ORT and provides recommendations for

assessing and managing children with acute diarrhoea, including those who have become dehydrated. Recent developments (PATH, 2009) in the science of gastroenteritis management have substantially altered case management. Physicians now recognize that zinc supplementation can reduce the incidence and severity of diarrhoeal disease, and an ORS of reduced osmolarity (i.e., proportionally reduced concentrations of sodium and glucose) has been developed for global use. The combination of oral rehydration and early nutritional support has proven effective throughout the world in treating acute diarrhoea (PATH, 2009).

1.2: STATEMENT OF THE PROBLEM

The high diarrhoeal mortality and poor usage rate of ORS indicates that there may be a lack of awareness and knowledge of ORS among people in spite of it wide availability. This doubt is strengthened by the WHO & UNICEF which documented the decreasing awareness of ORS among parents in some countries (WHO/UNICEF, 2004). Mothers are the main caretakers of under-five children. The awareness and knowledge of ORS among mothers is essential to reduce the avoidable morbidity and mortality, and health and psychosocial impacts associated with diarrhoeal diseases in under-five children. The low awareness and knowledge of ORS among mothers enhances the burden of diarrhoeal diseases (Lawn *et al*, 2007).

Diarrhoeal disease is very common in the developing world, where one out of every 20 children born is destined to die from diarrhoeal dehydration before reaching the age of five. Indeed, it is the major single cause of death among children, and accounts for the death of about five million children a year. In addition, repeated diarrhoeal episodes could impair the nutritional status of affected children who become increasingly susceptible to other acute infections (WHO, 2005).

Despite dramatic declines in deaths due to diarrhoeal disease among infants and children in developing countries, diarrhoea remains a significant cause of morbidity as well as mortality (Kosek, Bern and Guerrant, 2003; Keusch, Fontaine, Bhargava, Boschi-Pinto, Bhutta, Gotuzzo, Rivera, Chow, Shahid-Salles and Laxminarayan, 2006). Frequent or prolonged diarrhoea can lead to poor nutritional status, and repeated episodes of diarrhoea can also leave children susceptible to other infections (Mirza, Caulfield, Black and Macharia, 1997). Furthermore, malnutrition can increase the severity, duration, and frequency of bouts of

diarrhoea (Hirschhorn and Greenough, 1991). In developing countries, diarrhoea is a common cause of mortality among children aged <5 years, with an estimated 2 million deaths annually (King, Glass, Bresee and Duggan, 2003).

Diarrhoea leads to death through dehydration. Oral rehydration therapy (ORT) is a potentially effective treatment for dehydration due to diarrhoea that has been promoted widely throughout the developing world since the late 1970s. Victora, Bryce, Fontainne and Monasseh (2000) suggested that a large increase in the use of ORT played a central role in reducing deaths due to diarrhoea in Brazil and, moreover, that the reduction in diarrhoea deaths accounted for a large part of the substantial increase in child survival from the mid-1980s to the mid-1990s.

Diarrhoea is also a major cause of child malnutrition, in developing countries, 2.2 million people, most of them children, die every year from diseases associated with lack of access to safe drinking water, inadequate sanitation, poor hygiene and overcrowding. Undernutrition is the underlying cause of a substantial proportion of all child deaths. Infants who are fed only breast milk during the first 6 months seldom get diarrhoea. At six months, in addition to breast milk, complementary foods with increased feeding frequency and changes in food consistency, quantity, and diversity as the child ages.

More than half of all child deaths are associated with malnutrition, which weakens the body's resistance to illness. Poor diet, frequent illness, and inadequate or inattentive care of young children can lead to malnutrition. Of the 6.6 million deaths among children aged 28 days to five years: 1.7 million (26%) are caused by diarrhoea. 1 million (61%) of these deaths are due to the presence of under nutrition (UNICEF, 2009).

Diarrhoea kills more young children around the world than malaria, AIDS and TB combined. Yet a simple and inexpensive treatment can prevent many of those deaths. Twenty thousand children under age 5 die every day from easily preventable or treatable causes basic, lifesaving remedies still are not reaching millions of mothers and children in need' (Pakenham-Walsh, 2007). Eleven million child deaths every year, of which four million are deaths of newborn babies occurring in the neonatal period and 98%, are among the poor and disadvantaged in developing countries. Two-thirds could and should have been avoided by

simple, inexpensive healthcare intervention (Pakenham-Walsh, 2007). Dehydration remains a leading cause of morbidity and mortality in children. Although in developing nations the number of deaths from diarrhoea remains high, there has been a substantial decrease, mainly attributed to the use of oral rehydration therapy (ORT). Despite its efficacy, ORT is underused in many developed countries.

1.3: JUSTIFICATION OF THE STUDY

This study is significant for some reasons because, it is estimated that in the 1990s more than 1 million deaths related to diarrhoea may have been prevented each year and this is largely attributed to the promotion of oral rehydration salt (ORS) and oral rehydration therapy (ORT) adopted by UNICEF and WHO in the 1970s. Over a decade the promotion of ORT for Home management of diarrhoea has subsided and moreover diarrhoea is still the second killer of children among under-five in developing countries (NPC, 2009).

Today, however there are indications that in some countries knowledge and use of appropriate home therapies to successfully manage diarrhoea including ORT may be declining due to shifting of emphasis by public health authorities to the control of other equally communicable diseases such as malaria and upper respiratory tract infections. Some settlements like barracks favour the transmission of diarrhoea diseases among under-five. The knowledge and use of ORS by mothers of under-five in Nigerian Army barracks have not been fully studied. Hence there is need to determine the knowledge of diarrhoea, ORT and identify diarrhoea management practices involving use of Sugar-Salt-Solution among mothers of under-five in Odogbo army barracks.

One of the major causes of morbidity and mortality in developing countries is diarrhoea, especially in the case of under-five children (Kosek *et al*, 2003). Effective home management of acute childhood diarrhoea with oral rehydration salt (ORS) is the immediate and best applicable step under the local circumstances to minimize the morbidity and mortality associated with it, as prevention of diarrhoeal diseases are mostly long-term socio-economic development goals. The overall aim of the present study was to assess the knowledge and use of oral rehydration therapy among mothers of under-five children in Odogbo Army barrack,

lbadan, Nigeria. This in turn would evaluate the effectiveness of relevant national health promotion programmes in specific application to an average Nigerian society.

1.4: RESEARCH QUESTIONS

This research will provide answers to the following research questions.

1. What is the knowledge of mothers of under-five (U-5) about ORT/SSS in Odogbo Army barrack?
2. What is the knowledge of mothers of U-5 about diarrhoea in Odogbo Army barrack?
3. What is the preventive method of diarrhoea adopted by mothers of U-5 in Odogbo Army barrack?
4. To what extent have mothers used ORT during episodes of diarrhoea among their U-5 children?

1.5: BROAD OBJECTIVE

The broad objective of the study was to explore the knowledge and use of oral rehydration therapy among mothers of under-five children in Odogbo Army barracks, Ibadan, Nigeria.

1.6: SPECIFIC OBJECTIVES

The following objectives guided the implementation of the research.

1. Assess the mothers of U-5 level of knowledge about oral rehydration
2. Assess the level of knowledge of mothers of U-5 in Odogbo barracks about diarrhoea diseases.
3. Describe the diarrhoea preventive methods adopted by mothers of U-5 in the barracks
4. Determine the diarrhoea management practices among mothers of U-5 in the barracks

1.7: HYPOTHESES

1. There is no significant association between educational level of mother of under-five and knowledge of diarrhoea.
2. There is no significant association between parity of the mothers and diarrhoea management practices
3. There is no significant association between perceived seriousness of diarrhoea and diarrhoea management practices
4. There is no significant association between knowledge and use of oral rehydration therapy

1.8: DEFINITION OF TERMS

Diarrhoea: is the passage of loose or watery stools, usually at least three times in a 24 hour period.

Oral rehydration therapy: is a simple, cheap, effective treatment that can be prepared by parents at home to counteract dehydration.

CHAPTER TWO

LITERATURE REVIEW

2.1: ORT: from past to present

Since time immemorial, human beings have used oral fluids to restore perceived water losses either unconsciously or consciously as folk remedies. A 5000 years old medical science, Ayurveda (traditional Indian medicine) mentioned the management of acute fluid losses. The so called "ORT" was started by pediatricians in 1940 to treat mild dehydration due to childhood diarrhoea. In 1964, ORT was use in Philippines after this scientific observation, in 1960s, research in Dhaka, Bangladesh and Calcutta, India showed that the sodium and glucose co-transport mechanism remains intact in cholera patients, and rehydration and maintenance of hydration can be achieved through ORT (da Cunha Ferreira *et al*, 1990).

Doctor Dilip Mahalanabis, a cholera expert from Johns Hopkins centre for Medical Research and Training, Calcutta and head of refugee camps health center introduced the use of ORT to 350.000 patients. The table salt, baking soda and glucose sachets used to be packed in Calcutta for distribution along with the instructions about its preparation. The cholera fatalities came down to less than 4% in camps using ORT, compared with 20-30% in camps using intravenous rehydration therapy. This discovery significantly reduced the mortality due to diarrhoeal disease (Black *et al*, 2008). Many trials were conducted in various parts of the world which confirmed the effectiveness and safety of ORT in acute diarrhoea. In 1979, the WHO & UNICEF introduced ORT as a standard treatment of dehydration associated with diarrhoea (Victora et al, 2000).

Diarrhoea

The word "diarrhoea" originated from the Greek terms dia (through) and rhein (to flow) (Kenneth, Fine Guenter and Fordtran, 1988). Diarrhoea is the passage of loose or watery stools, usually at least three times in a 24 hour period. However, it is the consistency of the stools rather than the number that is most important. Frequent passing of formed stools is not diarrhoea. Babies fed only breast milk often pass loose, "pasty" stools; this also is not

diarrhoea. Mothers usually know when their children have diarrhoea and may provide useful working definitions in local situations (WHO 2005). It is caused by bacterial, viral, and parasitic organisms and is usually a symptom of gastro intestinal infection. Diarrhoeal disease is transmitted through the faecal oral route and is spread through contaminated food and drinking water or from person to person as a result of poor hygiene and sanitation (Keusch, Fontaine, Bhargava, Boschi-Pinto, Bhutta, Gotuzzo, Riveria, Chow, Shahid-Salles and Laximinarayan, 2006).

Diarrhoea is life-threatening because it leads to fluid loss and can cause severe dehydration. Infants who are not exclusively breastfed, young children, and adults who are malnourished or have weakened immune systems are at greatest risk (Keusch *et al*, 2006). Diarrhoeal diseases continue to be an important cause of morbidity and mortality worldwide, and despite all advances in health technology, improved management, and increased use of oral rehydration therapy (ORT) in the past decades, they remain among the five major killers of children under five years of age (Boschi-Pinto, Lanata, Mendoza, and Habte, 2006).

Syndromes of diarrhoea

There are three major diarrhoea syndromes: acute watery, persistent, and bloody

1. 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 *Escheria coli,* or *Vibrio. cholerae* (cholera).

2. Persistent diarrhoea, a less common form, is typically connected with malnutrition and is disproportionally associated with an increased risk of death.

3. Bloody diarrhoea is often related to malnutrition intestinal damage, and secondary sepsis. It is often associated with dysentery (Keusch *et al*, 2006).

2.2: Prevention

Nearly nine out of ten child deaths due to diarrhoea could be prevented by interventions existing today. There are more effective and lifesaving solutions for preventing and treating diarrhoea than any other childhood illness. Diarrhoeal disease has many different causes and infections respond differently to each intervention method, successfully combating diarrhoeal

disease requires a coordinated approach that includes both prevention and treatment methods to effectively address and treat:

Diarrhoeal disease prevention methods include;

1. Improve access to clean water and safe sanitation.
2. Exclusive breastfeeding can prevent and mitigate the effects of diarrhoea in infants under six months of age
3. Promoting hygienic education
4. Improving weaning practices and adequate complimentary feeding.
5. Keeping food and water clean
6. Washing hand with soap and water before preparing or touching food
7. Sanitary disposal of stools
8. Existing vaccines for rotavirus and solution of salts vaccines currently under developments for the bacterial causes of diarrhoea have the potential to save millions of lives (Keusch *et al*, 2006).

2.2.1: Breastfeeding

Breast-feeding, especially if this is the only source of nutrition, has been shown to protect children against the development of diarrhoea in Africa (Scott-Emuakpor and Okafor, 1986; Mock, Sellers, Abdoh and Frankin, 1995). Exclusive breastfeeding (no additional food and fluids) provides infants six months of age and younger with essential nutrients and immune factors that both protect them from diarrhoeal disease and speed diarrhoea recovery when episodes occur. During the first 6 months of life, infants should be exclusively breastfed. This means that the healthy baby should receive breast milk and no other foods or fluids, such as water, teas, juice, cereal drinks, animal milk or formula (PATHS, 2009).

Exclusively breastfed babies are much less likely to get diarrhoea or to die from it than are babies who are not breastfed or are partially breastfed. Breastfeeding also protects against the risk of allergy early in life, aids in child spacing and provides protection against infections other than diarrhoea (e.g. pneumonia). Breastfeeding should continue until at least 2 years of age. The best way to establish the practice is to put the baby to the breast immediately after birth and not to give any other fluids. The advantage of breastfeeding is that it is a complete food with adequate compositions for infants.

2.2.2: Improved feeding practices

Complementary foods should normally be started when a child is 6 months old. These may be started any time after 4 months of age, however, if the child is not growing satisfactorily. Good feeding practices involve selecting nutritious foods and using hygienic practices when preparing them. The choice of complementary foods will depend on local patterns of diet and agriculture, as well as on existing beliefs and practices. In addition to breast milk (or animal milk), soft mashed foods (e.g. cereals) should be given. When possible, eggs, meat, fish and fruit should also be given. Other foods, such as well cooked pulses and vegetables, to which some vegetable oil (5-10 ml/serving) has been added, should be given. To encourage exclusive breastfeeding and proper feeding practices, health workers should be instructed in the regular use of growth charts to monitor the weight of children. Before a child with diarrhoea leaves a health facility, his or her weight should be taken and recorded on the child's growth chart (WHO, 1993).

2.2.3: Use of safe water

The risk of diarrhoea can be reduced by using the cleanest available water and protecting it from contamination.

Families should:

1. Collect water from the cleanest available source.
2. Not allow bathing, washing, or defecation near the source. Latrines should be located more than 10 metres away and downhill.
3. Keep animals away from protected water sources.
4. Collect and store water in clean containers; empty and rinse out the containers every day;
5. Keep the storage container covered and not allow children or animals to drink from it;
6. Remove water with a long handled dipper that is kept especially for the purpose so that hands do not touch the water;
7. If fuel is available, boil water used for making food or drinks for young children. Water needs only to be brought to a rolling boil (vigorous or prolonged boiling is unnecessary and wastes fuel) (WHO, 1993).

The amount of water available to families has as much impact on the incidence of diarrhoeal diseases as the quality of water. This is because larger amounts of water facilitate improved hygiene. If two water sources are available, the highest quality water should be stored separately and used for drinking and preparing food.

2.2.4: Hand washing

All diarrhoeal disease agents can be spread by hands that have been contaminated by faecal material. The risk of diarrhoea is substantially reduced when family members practice regular hand washing. According to Limlim (2008), hand washing can reduce diarrhoea episodes by about 30% and up to 47% reduction has been achieved in some cases. Optimal hand-washing with soap can reduce diarrhoea by 45 percent. All family members should wash their hands thoroughly after defecation, after cleaning a child who has defecated, after disposing of a child' stool, before preparing food, and after. Good hand washing requires the use of soap or a local substitute, such as ashes or soil, and enough water to rinse the hands thoroughly (Curtis and Cairncross, 2003).

2.2.5: Food safety

Food can be contaminated by diarrheal agents at all stages of production and preparation, including: during the growing period (by use of human fertilizers), in public places such as markets, during preparation at home or in restaurants, and when kept without refrigeration after being prepared.

Individual food safety practices should also be emphasized. Health education for the general population should stress the following key messages concerning the preparation and consumption of food:

1. Do not eat raw food, except undamaged fruits and vegetables that are peeled and eaten immediately.
2. Wash hands thoroughly with soap after defecation and before preparing or eating food.
3. Cook food until it is hot throughout.
4. Eat food while it is still hot, or reheat it thoroughly before eating.
5. Wash and thoroughly dry all cooking and serving utensils after use.

6. Keep cooked food and clean utensils separately from uncooked food and potentially contaminated utensils.
7. Protect food from flies by means of fly screens (WHO, 2005).

2.2.6: Use of latrines and safe disposal of stools

An unsanitary environment contributes to the spread of diarrhoeal agents. Because the pathogens that cause diarrhoea are excreted in the stools of an infected person or animal, proper disposal of faeces can help to interrupt the spread of infection. Faecal matter can contaminate water where children play, where mothers wash clothes, and where they collect water for home use. Every family needs access to a clean, functioning latrine. If one is not available, the family should defecate in a designated place and bury the faeces immediately. Stools of young children are especially likely to contain diarrhoeal pathogens; they should be collected soon after defecation and disposed of in a latrine or buried (Ezzati *et al*, 2002).

2.2.7: Administration of ORT

Oral rehydration therapy (ORT) and oral rehydration solution (ORS) involve rehydrating children by replacing fluids and electrolytes lost through diarrhoea. The broader intervention method, ORT, involves rehydrating children through increased appropriate and available fluids such as breast milk or rice water mixed with salt, soups, and cereals and continued feeding to prevent and treat diarrhoea-related dehydration. According to current WHO/UNICEF guidelines, ORT should begin at home with "home fluids" or a home-prepared "sugar and salt" solution at the first sign of diarrhoea to prevent dehydration. Feeding should be continued at all times. However, once dehydrated, the regimen should be switched to official preparations of Oral Rehydration Solution (ORS) at the appropriate dosing times to ensure adequate hydration (WHO, 2005).

During the home-prepared stage, care should be taken to select the proper type of fluid to administer. The fluids given must contain both sugar and salt. Liquids without both these components must be avoided. Liquids without salt can lead to low body salt (hyponatremia) because the diarrhoeal stool contains salt and must be replenished. Additionally, sugar must be present in the administered fluid because salt absorption is coupled with sugar in the intestine via the SLGTI transporter. Appropriate drinks to administer during the home-

prepared stage include official ORS solutions, salted rice water, salted yogurt-based drinks, and vegetable or chicken soup with salt. Drinks to be avoided include clean water, unsalted drinks, soft drinks, sports drinks, and fruit drinks/juice, sweetened tea. and coconut water Drinks with a high concentration (osmolarity) of sugar can worsen diarrhoea as they draw water out of the body and into the intestine because of their hyper tonicity (WHO, 1993).

2.2.8: Availability of ORT

By definition, ORT is available anywhere that adequate nutrition is available. ORS, on the other hand, is typically packaged in pre-measured sachets that are ready to be mixed in water (generally 1L). These are available in via commercial manufacturers or supplied by local/regional governments or relief agencies such as UNICEF. In 1996 alone, UNICEF distributed 500 million sachets of ORS to over 60 developing nations (UNICEF, 1996). Among the commercial suppliers, many variations in formulations abound and there is no restriction as to what formulation can be marketed as ORS. As such, some vendors include extra sugar or other

2.2.9: Zinc supplementation

There is an additional recommendation of zinc supplementation (WHO, 2008) for the management of diarrhoeal disease in addition to ORS, particularly for paediatric patients. For children under five, zinc supplementation significantly reduces the severity and duration of diarrhoea and is strongly recommended as a supplement with ORS for dehydrated children (WHO, 2005). Preparations are available as a zinc sulfate solution for adults, (WHO, 2008) a modified solution for children and also a tablet form for children (WHO 2008).

2.3: Prevalence of diarrhoea in the developing world

Diarrhoea is among the leading causes of morbidity and mortality in infants and children in developing countries. According to Pakenham-Walsh (2007), 28,000 children under age 5 die every day from easily preventable or treatable causes as basic, lifesaving remedies still are not reaching millions of mothers and children in need. Jones, Steketee, Black, Bhutta, Morris, and Bryce *et al* (2003) reported that worldwide, it is estimated that more than two million children under the age of five die annually as a result of gastroenteritis with dehydration. Of the estimated total 10.6 million deaths among children younger than five years of age worldwide,

42 percent occur in the World Health Organization (WHO) African region (Bryce, Boschi-Pinto, Shibuya and Black, 2005).

Mortality rates among these children have declined globally from 146 per 1,000 in 1970 to 79 per 1,000 in 2003 (WHO 2005). Similarly, Kosek, Bern, and Guerrant (2003) stated that global estimates of the number of deaths due to diarrhoea have shown a steady decline, from 4.6 million in the 1980s to 3.3 million in the 1990s to 2.5 million in the year 2000. However, there is a striking difference in the situation in Africa. Compared with other regions of the world, the African region shows the smallest reductions in mortality rates and the most marked slowing down trend. According to the WHO (2005), the under-five mortality rate in the African region is seven times higher than that in the European region. The same report also showed that during the 1990s, the decline of under-five mortality rates in 29 countries of the world stagnated, and in 14 countries rates went down but then increased again. Most of these countries are from the African region. Walker, Schwartländer and Bryce (2002) opined that an underlying weakness of the implementation capacity of the health system is likely to blame for this apart from the HIV/AIDS epidemic in Africa.

In a study among rural women in Somalia, diarrhoea was the second most common symptom of disease in a longitudinal study of 431 children under 5 years of age in rural Somalia (Ibrahim, Aden, Omar, Wall and Persson, 1994). Similarly, a study among mothers/caregivers of under-five children in rural Kenya showed that majority of the respondents (87.1%) reported that their children had suffered from diarrhoea within the last 2 weeks before commencement of the study while diarrhoea was found to contribute to 48% of child mortality in the study area. According to Jones *et al* (2003), of the 6.6 million deaths among children aged 28 days to five years: 1.7 million (26%) are caused by diarrhoea.

Diarrhoeal disease is a major cause of death in children in the developing world (Jousilahti, Madkour, Lambrechts, Sherwin, 1997; Abiola, Ndaman, Idris, Jiya and Ibrahim, 2010). While diarrhoeal disease is a global killer, it disproportionally strikes those living in developing nations. In developing countries a quarter of infant and childhood mortality is related to diarrhoea. On average, children under 3 years of age in developing countries would experience three episodes of diarrhoea each year. In 1999, 15% of 10.5 million deaths among

children under-five years in developing countries were diarrhoea (WHO, 2000). Similarly, Gyimah (2003) stated that diarrhoea is a leading cause of mortality and morbidity among children in sub-Saharan Africa. Despite the advances in health and sanitation, sub-Saharan Africa continues to show a pattern of high childhood mortality mainly due to infectious and parasitic diseases, with diarrhoea as one of the leading causes (Kirkwood, 1991). According to the World Health Organization, each child in the region experiences an average of five episodes of diarrhoea per year resulting in about 800,000 annual deaths (WHO, 1993). Ngianga-Bakwin, Chen, Nigel, Saverio, and Francesco (2007) stated that recent Demographic and Health Surveys (DHS) from Sub-Saharan Africa (SSA) indicate a decline in childhood vaccination coverage but a high prevalence of childhood diarrhoea, cough, and fever.

2.4: Diarrhoea in Nigeria

At the national launch of hand washing campaign in 2008, the then acting UNICEF representative in Nigeria, Dr. Robert Limlim, stated that diarrhoea prevalence rate in Nigeria is 18.8% and is one of the worst in sub-Sahara Africa and above the average of 16%. Childhood morbidity and mortality in Nigeria remain high in recent decades due to the burden associated with highly prevalent diseases such as diarrhoea, malaria, and HIV/AIDS (Ngianga-Bakwin, Chen, Nigel, Stranges, and Francesco, 2007). Findings of the 2008 National Demographic and Health Survey showed that 10 percent of the children under five had a diarrhoeal episode in the two weeks preceding the survey and 2 percent had blood in the stool. In a spatial analysis of risk factors for childhood morbidity in Nigeria, Ngianga-Bakwin, Chen, Nigel, Saverio and Francesco (2007) reported that the North East had the highest prevalence of childhood diarrhoea at (30%), they added that on average, children from states in the South West, South South, and South East were less associated with diarrhoea than those living in the northern and central districts. A similar finding was reported in the 2008 National Demographic and Health Survey as the prevalence of diarrhoea was found to vary among the geo-political zones with children in North-East zone being more susceptible to episodes of diarrhoea (21 percent) than children in other zones. The lowest proportion of children with diarrhoea was in the South-South region (4 percent).

According to Ngianga-Bakwin, Chen, Nigel, Saverio and Francesco (2007), Sahelian drought is probably one of the most influential reasons for the higher prevalence of childhood

diarrhoea in the Northern Nigeria as it has been found to be an important, socioeconomic determinant in both northern Nigeria and neighboring countries, which have suffered from increasing pressures on the available resources due to a fluctuating rainfall regimen in the latter part of the last century. Therefore, agricultural activities have been severely affected, and the resulting food security crisis forced people to consume unfit food and polluted water, which in turn affected feeding practices. Meanwhile, the resulting poverty prevents people from accessing the free health centers and buying medication. Because of poverty, insufficient household sanitary conditions, and other related factors, mothers might not be able to feed infants with enough clean breast milk so that mixed low-quality foods or contaminated water were used instead.

Ahiadeke (2000) in a large scale study in Ghana and Nigeria found that diarrhoea was prevalent in infants aged 4–6 months from households with poor sanitary conditions unless mothers reverted to exclusive breastfeeding. According to Sanusi and Gbadamosi (2009) poor sanitary environment has been suggested as one of the reasons why diarrhoeal diseases and consequent dehydration is so common in Nigeria. Diarrhoea accounts for over 16% of child deaths in Nigeria and an estimated 150,000 deaths mainly amongst children under five occur annually due to this disease mainly caused by poor sanitation and hygiene practices (Limlim, 2008).

2.5: Knowledge and perception of diarrhoea among caregivers

Knowledge is a cognitive predisposing factor that motivates or provides a reason for a behaviour or practice (Hubley, 2004). Pakenham-Walsh (2007) stated that lack of knowledge about treatable illnesses such as pneumonia and diarrhoea kills many children every year. The issue of lack of knowledge concerns mothers the most since they are the caregivers of children and are also regarded as the primary producers of health in the family. According to the Child Health Research Project Special Report (1998), the mother or another caregiver usually provides initial management in the home. In the past, provision of health care was primarily considered the domain of health providers. However, the current trend has recognized the importance of mothers and the family in identifying, caring for and preventing children's illnesses.

Abiola *et al* (2010) in a study among mothers in Sokoto, Northern Nigeria stated that the majority (62.9%) of the mothers knew correctly that diarrhoea is said to occur when a child passes loose stool more than three times within 24hours and that majority (81.1%) also knew that diarrhoea can be caused by contaminated water and food, 32.4% were also of the view that evil eye is the cause of diarrhoea while majority of the mothers believed that ORS/SSS is the best method for home management of diarrhoea though 11.1% believed it is harmful to the child. In a study on the home management of diarrhoea among under-five children in a rural community in Kenya, (Othero, Orago, Groenewegen, Kaseje and Otengah, 2008) reported that the perceived causes of diarrhoea among mothers/care givers were: unclean water 524 (55.6%), contaminated food 508 (54.9%), bad eye 464 (50.0%), false teeth 423 (45.6%) and breast milk 331 (35.8%). Their findings also revealed that only 3.1% of the mothers new all the danger signs of diarrhoea. Knowledge of danger signs is important because it leads to early referral of very sick children as the failure to refer such children results in major complications or death. The main causes of diarrhoea are poor hygiene, lack of clean drinking water, overcrowding, and the trend towards bottle-feeding rather than breastfeeding. Infants who are fed only breastmilk seldom get diarrhoea (Al-Ghamdi *et al*, 2009).

Across cultures several patterns have been recognized which determine the use of healthcare services for diarrhoeal diseases. According to Kaljee, Pack, Pach, Nyamete and Stanton (2004), these include: Perceptions of the severity of the illness affecting caregivers' decisions to seek treatment and influencing the type of treatment used; the patient's or care-provider's beliefs about causative factors of the disease which play a role in the decision to seek healthcare in the first place and types of treatment ultimately chosen. The variables that affect individuals' healthcare-seeking behaviours are not static, but dynamic and dependent on past experiences, immediate access to resources, perceived efficacy of resources available, and beliefs about causes and treatments. Perceptions of mothers regarding causes of diarrhoea in children are a recipe to timely and proper management at home and subsequent referral for skilled care. A study by Ibrahim, Aden, Omar, Wall and Persson (1994) showed that in rural Somalia, most mothers perceived diarrhoea as a condition in which ORT and feeding were logical approaches to its management.

A study among caregivers in Taung district, a rural setting in South Africa, only 23% of the study group could identify the danger signs for severe dehydration, which include persistent vomiting, deterioration in consciousness and becoming weak and lethargic (Dippenaar, Joubert, Nel, Bantobetse, Opawole and Roshen, 2005). Mbonye (2004) in a study in Uganda stated that almost half the children who had diarrhoea were taken to a health unit. He adduced that this action was taken because diarrhoea weakens children quickly, and this is regarded as serious to the child. Therefore diarrhoea was perceived to be serious by the mothers who were the study population. A study among mothers of under-five children in Vietnam showed that half of the mothers believed that diarrhoea was not dangerous for children.

Similarly in the Nigeria Health and Demographic Health Survey (2008), twenty-nine percent of children with diarrhoea did not receive any treatment at all. Though no reason was given by the mothers/caregivers for this, one of the deductions that can be made is that some of them may not have perceived the condition as serious enough to merit being treated. Some other schools of thought believe that mothers' perception of diarrhoea differs from that of physicians. According to Paredes-Solari, De la Peña, Flores, Yeager, García (1992) to the lay population, causes of diarrhoeal diseases comprise different factors in which infectious agents are not always identified. Conditions, such as the "evil eye" or "fright disease", are considered causes of childhood diarrhoea

Since mothers are usually the caregivers of children, the ability of a mother to be able to recognize that a child has diarrhoea determines to a large extent whether the child will survive the episode. Ability to identify an episode of diarrhoea could be a function of education as being literate could help a mother to be exposed to information that would make her aware of various childhood diseases and the steps to take. Infact, education may also have a significant role to play in the prevention of diarrhoea. For example, in a study of home management of diarrhoea in Nigeria, Yoruba mothers with a higher level of education were more likely to use a combination of Western and traditional treatments, although very few mothers were inclined to use Western medicine alone (Brieger, 1990) In a study among 200 mothers in Pakistan to determine the association between maternal illiteracy and frequency of childhood diarrhoea, Rehman, Salman, Tahira and Mehmood (2009) reported that frequency and morbidity of diarrhoea was more in less educated mothers. Similarly in Sudan, illiterate mothers in rural

Sudan were more likely than literate mothers to stop breastfeeding or use incision and cautery of the gums where teeth are erupting as treatments for diarrhoea (Ahmed, Eltom, Karrar and Gibril, 1994). In another study in Bangladesh, caretakers in families with education were found to feed the children more frequently, with fresher food, and in cleaner, more protected places (Rousham, Northrop-Clewes and Lunn, 1998).

The findings of a study by Mbonye (2004) to determine the risk factors for diarrhoea and upper respiratory tract infections among children in a rural area of Uganda showed no association between education of mother and the risk of a child getting diarrhoea, URTIs, or the immunization status of a child. However, a study in Uganda, combining both rural and urban districts, demonstrated that education of a mother is negatively associated with the risk of a child getting diarrhoea and URTIs as children born to mothers with secondary education and above were less likely to suffer from diarrhoea and URTIs and are likely to receive immunization and benefit from better healthcare (Uganda Bureau of Statistics, 2001).

Ngianga-Bakwin *et al* (2007), children of educated mothers had a lower association with diarrhoea. This finding suggests that these mothers were likely to have more health-care knowledge to protect their children and to deal with these conditions more effectively. The World Bank and the 2003 NDHS reports both found that mother's education can significantly reduce childhood morbidity by improving the mother's health seeking ability. Similarly, a study in Ghana revealed that the children of less educated are the most prone to diarrhoea in the absence of piped water and toilet facilities (Gyimah, 2003). He therefore concluded that highly educated mothers protect their children against diarrhoea much better under unhygienic circumstances than their less educated counterparts.

2.6: Relationship between diarrhoea and malnutrition

There is a causal relationship between diarrhoea and malnutrition. Diarrhoea leads to malnutrition while malnutrition aggravates the cause of diarrhoea, many factors contributes to the detrimental effects of diarrhoea on nutrition, reduced intake, malabsorption, increased nutrient loss and the effects of the inflammatory response are some factors involved (Nel, 2010).

Children who survive persistent diarrhoea are likely to suffer from malnutrition, stunted growth, and learning difficulties (PATHS, 2009). According to WHO (2005), during diarrhoea, decreased food intake, decreased nutrient absorption, and increased nutrient requirements often combine to cause weight loss and failure to grow: the child's nutritional status declines and any pre-existing malnutrition is made worse. In turn, malnutrition contributes to diarrhoea which is more severe, prolonged, and possibly more frequent in malnourished children. Acute and chronic infections contribute to malnutrition by causing decreased food intake, impaired absorption, increased losses of fluid, electrolytes, protein, and iron, and by altering the normal metabolism. Similarly, Pancharuniti, Shiyalap, Dung and Wongsawass, (2004) stated that diarrhoea is a leading cause of childhood mortality in developing countries and an important cause of malnutrition.

Briend (1990) stated that diarrhoea is not the only direct cause of death, but it also causes malnutrition, especially in infants and children under five years old. Dehydration caused by diarrhoea is a major cause of death among children. Of the 6.6 million deaths among children aged 28 days to five years: 1.7 million (26%) are caused by diarrhoea, one million (61%) of these deaths are due to the presence of under-nutrition (Jones *et al*, 2003). Millions who survive only face diminished futures, unable to develop to their full potential. According to Briend (1990) chronic malnutrition may be a risk factor for diarrhoea. Diarrhoea has both short-term and long-lasting effects, ranging from severe dehydration to malnutrition, which in turn can weaken its victims' immune systems and make them more susceptible to future diarrhoea episodes as well as other illnesses. Children who are malnourished are also more susceptible to the consequences of diarrhoea. In fact, many children dying of diarrhoea would likely survive if they were adequately nourished (Black, Allen, Bhutta, Caulfield, de Onis, Ezzat, Mathers and Rivera, 2008).

During diarrhoea, the body loses water and electrolytes in the form of liquid stool. Fluids can also be lost through vomit, sweat, urine and breathing. Dehydration occurs when these losses are not adequately replaced. Diarrhoea may result in a decrease in food intake or nutrient absorption and an increase in nutrient requirements which often combine to cause weight loss and retarded growth. Repeated attacks of diarrhoea contribute to malnutrition, and diarrhoeal diseases are more likely to cause death in children who are malnourished (WH0, 2005).

According to the Jones *et al* (2003), when a child's nutritional status declines, any pre-existing malnutrition becomes worse. In turn, a child with malnutrition can experience diarrhoea that is more severe, more prolonged and more frequent than a non-malnourished child. According to Al-Ghamdi *et al* (2009), diarrhoea is also a major cause of child malnutrition. Furthermore, a child with malnutrition can experience diarrhoea that is more severe, more prolonged and more frequent than a non-malnourished child (Jones *et al*, 2003).

2.7: Environmental factors and diarrhoea

The relationship between environmental sanitation and the occurrence of diarrhoea has been examined by some studies. Divergent views have however been expressed as regards the association. Although the majority of diarrhoea in children is caused by an infectious agent, the web of determinants for diarrhoea in children is complex and the relative contribution of each factor varies as a function of complex interactions between the different aetiological agents and several other factors. These factors could be grouped as socioeconomic (Fuchs and Victora, 2002), environmental (those that facilitate faecal-oral transmission of infectious agents (Rego, Moraes, Dourado, 2005; Miroes, Cancio, Cairncross and Huttly, 2003), related to contacts (those that increase the chance of contact and persons-to-person transmission of infection, such as crowding or high density of housing and associated with microbiological contamination of food (such as inadequate cooking or time temperature abuse) (Strina, Cairncross, Barreto, Larrea and Prado, 2003).

A study by Omokhodion, Oyemade, Sridhar, Olaseha and Olawuyi (1998) showed that there was no significant difference in the occurrence of diarrhoea between children of market women in a clean market and an unhygienic market. They therefore concluded that environmental sanitation may not be a major determinant of diarrhoea among children of the two groups of market women. Similarly, a report by the WHO (2000) indicated that improvements in sanitation and in food and water quality have failed to alter the incidence of rotavirus infection in many countries. These however do not mean that environmental conditions do not have a causal relationship with diarrhoea. Most poorly educated women engage in trading in order to generate income for their families (Ene-Obong, Uwaegbute and Iroegbu, 2000). They also were of the view that the market environment in Nigeria, with its

prevailing unsanitary conditions and overcrowding, is also a source of potential risk factors for children.

Gyimah (2003) opined that diarrhoeal diseases poses a major threat to child health and survival in sub-Saharan Africa and not surprisingly, there have been considerable policy and research interests in understanding the etiology and preventive measures. It is, for instance, widely recognized that exposure to the diarrhoeal pathogen is conditioned by a variety of household environmental factors, particularly water and toilet facilities (Ahiadeke, 2000; Root, 2001; Woldemicael, 2001). A study by Al-Ghamdi, Bentham and Hunter (2009) among male school children in Jeddah city, Saudi Arabia reveals that the main risk factors were; the number of children under five years living in the same house, reporting sewage spillage near home, eating out after school hours, not drying hands after washing them and using reusable cloths to dry dishes. In 2000, for instance, about 1.3 million children in developing countries were estimated to have died from diarrhoeal diseases as a result of unsafe water, sanitation and hygiene (WHO/UNICEF, 2002).

Though it has been discovered that treats are found in households without toilets and piped water facilities. According to Mbonye (2004) identification of personal hygiene practices, environmental factors, and the immunization status of a child as risk factors for diarrhoea and Upper Respiratory Tracts Infections have implications in designing appropriate prevention strategies directed at three levels: interventions for improving personal hygiene, especially when feeding children; interventions for improving infant nutrition, especially exclusive breast-feeding for four months as recommended in the Ministry of Health policy guidelines; and interventions directed at improving environmental hygiene, especially disposal of faeces and garbage's.

2.8: Management of diarrhoea among mothers/caregivers

Diarrhoea starts at home, so early and appropriate treatment by caregivers before the child is brought to hospital will greatly contribute towards reducing the morbidity and mortality. Families and communities are the key to achieving the goals set for managing diarrhoea. Good home management consists of both prompt and correct use of oral rehydration therapy (ORT) solution and avoidance of inappropriate use antibiotics and other drug preparations.

ORT is well established worldwide as the mainstay of national diarrhoea control programme (Black, Morris and Bryce, 2003).

Maternal health beliefs toward diarrhoeal disease in children play a crucial role in their home management of the acute diarrhoea. Maternal home practices on management of acute diarrhoea in children under 5 years old are important and are defined under WHO recommended guidelines as giving extra fluids intake especially Oral Rehydration Salt Solution (ORS) to children, continuation on child feeding, recognizing of dangerous signs of acute diarrhoea (fever, repeatedly vomiting, bloody stool, not able to drink or breast-fed adequately), and bring the child to the health worker for check up on its severity. Women are the principal providers of family healthcare. Therefore, a lot depends on them as they are considered to be the primary producers of health in the family. The management by mothers/caregivers is very crucial. Many children die because their parents do not recognize warning signs that indicate the children suffering from one or more of the above illness. According to treatment guidelines issued by WHO (2005), most cases of childhood diarrhoea can be treated at home by continuing feeding and increasing fluid intake.

When a child has diarrhoea, mothers are encouraged to continue feeding their child the same amount of food as normal and to increase the child's fluid intake. These practices help to reduce dehydration and minimize the adverse consequences of diarrhoea on the child's nutritional status. Some studies have however found out wrong management practices in the treatment of diarrhoea among mothers and care givers. In a study among mothers/caregivers of under-five children in Kenya, it was found out that more than 70% of mother's decreased fluid intake during diarrhooea episodes. The mothers perceived wheat flour, rice water and selected herbs as anti-diarrhoeal agents. During illness, 239 (27.8%) of the children were reported not to have drunk any fluids at all, 487 (52.5%) drunk much less and only 93 (10.0%) were reported to have drunk more than usual. A significant 831 (89.6%) withheld milk including breast milk with the notion that it enhanced diarrhoea (Othero, Orago, Groenewegen, Kaseje and Otengah, 2008). In the 2008 Nigeria Demographic and Health Survey, only 6 percent of children who had diarrhoea had increased fluid intake and continued feeding during the diarrhoea episode while twenty-five percent of children were given ORT, increased fluids, and continued feeding. In addition, 32 percent of the children were given

somewhat less to drink than usual, and 22 percent were given much less to drink during the diarrhoea episode while four percent of children were not given any food during the diarrhoea episode.

In Nigeria, diarrhoeal diseases are accountable for 27% and 19% of all infants and under-five mortality respectively (NPC, 1999). Fifty percent of all diarrhoea deaths among children are either due to lack of access to oral rehydration solutions and or health facilities or as a result of incorrect case management (at home or in the health facility) (WHO/UNICEF, 2002). Cultural factors are particularly important determinants of the management of diarrhoea. Withholding of food by caregiver and failure to compensate for decreased food intake during illness by increasing feeding during convalescence are major contributors to the adverse nutritional outcomes of diarrhoea. The belief of resting the gut during diarrhoea is based on the idea that feeding could enhance the passage of frequent watery stools, thus increasing and prolonged the duration of diarrhoea. In addition to folk belief, medical advice often supports the withholding of particular foods during and after diarrhoea (Dialogue on Diarrhoea, 2004). However, the WHO has strongly recommended that breast feeding and any kind of usual feeding be continued during diarrhoea (WHO/UNICEF, 2002).

In a study to determine the fluid intake and feeding practices among under five year old children in Odukpani, Nigeria during episodes of diarrhoea, Edet (1996) found out that fluid intake was low. The average amount of salt-sugar solution (SSS) and WHO/UNICEF recommended oral rehydration solution (ORS) formula drank within the preceding 24 hours of diarrhoea was 368 mls and 274 mls respectively. However in the study, only 54.0% and 43.3% of children received same or more food and fluid respectively as compared with before the diarrhoea. Findings from a study on diarrhoeal disease morbidity and home treatment practices in Egypt showed that only 2 of the 36 children with blood in the stool had received an antibiotic or an antiparasitic drug while just 21.9% had received oral rehydration solution (ORS) (Jousilahti, Madkour, Lambrechts and Sherwin, 1997). Similarly, Wadhwani (2005) stated that four in ten mothers in Maharashtra state, India, believed they should withhold fluids if their baby develops diarrhoea. Lawn, Costello, Mwansambo and Osrin (2007) reported that more than two thirds of children in Africa and South Asia do not receive the correct home management for diarrhoea.

Olawuyi, Egbewale, Anifalaye and Okochi (2004), in a study in south west of Irepodun LGA of Kwara state among 4061 children who were 5 years or below, the rate of use of salt sugar solution was 16% while that of oral rehydration salt was 6%. Seventy three percent of mothers interviewed did nothing for the treatment of diarrhoea, nor understood what to do, 16% used various drugs, 69% of the health facilities in these rural districts used antibiotics as their first line anti- diarrhoea treatment.

Jinadu, Odebiyi, and Fayewonyom (1996) reported that sixty per cent of mothers' in rural Yoruba communities in Osun State, Southwest Nigeria would reduce the intake of fluids for the most common types of diarrhoea. Abiola *et al* (2010) in a study on the home management of childhood diarrhoea among mothers in Sokoto, Northwest Nigeria reported that a great proportion of those who had attempted to manage diarrhoea at home reported that the child's condition improved. Also, a study among mothers of under-five children in Vietnam showed that when children had diarrhea, about 50% of them would feed their children with more fluid, 65.6% continue feeding, 54.8% didn't use any drugs, 55.2% recognized dangerous signs of acute diarrhea, and 67.4% had good hygiene practice in washing hands to avoid food contamination. The results of the NPC 2009 also showed that thirty-seven percent of children with diarrhoea were treated with oral rehydration therapy (ORT) or increased fluids.

Ene-Obong, Uwaegbute and Iroegbu (2000) in a study on the management of childhood diarrhoea by two groups of market women-those who took their children to the market and those who left theirs at home found out that only 23% and 9%, respectively used SSS alone. Most of them used drugs, Ene-Obong et al (2000), adduced this to the fact that in the case of market women, the use of drugs may prove to be more convenient since it will save them time for preparation of SSS and ostensibly reduce their time away from market activities. The use of drugs for the treatment of diarrhoea is recommended for only a small proportion of diarrhoeal cases. According to Jousilahti *et al* (1997), the high proportion of cases treated with drugs, other than ORS, is the major problem in diarrhoeal home case management in Egypt. In a study they conducted among caregivers, they discovered that the majority of the caregivers knew of Oral Rehydration Salts (ORS), only 22% of cases with diarrhoea in the last 24 hours received ORS.

Another study revealed a worrisome trend where mothers do not recognize the need to seek medical care when it was necessary and sought medical care when it was unnecessary. Pérez-Cuevas, Guiscafré, Romero, Rodríguez and Gutiérrez (1996) in a study to determine mothers' health-seeking behaviour in acute diarrhoea in Mexico stated that 34.1% of the mothers did not seek medical care, even when their children needed attention and that many mothers took their children to the health facility even when this was not necessary. This finding stresses that mothers do not have enough knowledge to recognize the need to seek medical care and act accordingly it also highlights the importance of educating mothers on when to seek medical care for their children. Apart from the inability to recognize when medical attention is needed or not for the child suffering from diarrhoea, there has also been the issue of improper management practices among mothers/caregivers. A study among 747 mothers in Mexico revealed that the use of herbal teas to stop diarrhoea constituted 52.3% of household treatments. Apart from the issue of being able to recognize the signs and symptoms of diarrhoea, the position of the woman in the household as well the decision-making power also plays a role. An observational study in Somalia by Ibrahim *et al* (1994) suggested that the use of ORS is associated with a mother's ability to allocate time to health care and her general position in the household since mothers-in-law and husbands also made decisions on the management of sick children at home.

2.9: Knowledge and use of ORT in the management of diarrhoea

Diarrhoea deaths can be avoided using effective and cheap management methodologies. A major advance in the treatment of diarrhoea was the development of oral rehydration therapy (ORT). ORT has been described as "potentially the most important medical advance of this century. ORT and ORS were critical in preventing more than one million diarrhoeal disease deaths annually by the 1990s. However, despite these successes, ORT and ORS use has stagnated in some countries and declined in others (PATH, 2009). In a study by Amy, Peter, Zana, Kat and Eric (2007), in the home management of childhood diarrhoea in Southern Mali, nearly all parents in the study group knew oral rehydration solution could replace lost fluids, its inability to stop diarrhoea caused parents to seek antibiotics from local markets, traditional medicines or anti- malarial to cure the illness.

Meyers, Rumenapf, Tautz (1991) stated that the appropriate and timely use of ORT could prevent most of the mortality associated with diarrhoea dehydration. Oral rehydration therapy (ORT) is the best treatment for rehydrating patients with acute infectious diarrhoea and its use has reduced childhood mortality worldwide (Kosek, Bern and Guerrant, 2003). Despite this, ORT is not being used as it should. Although ORT is a simple and cheap lifesaver, it is not used optimally (Dippenaar, Joubert, Nel, Bantobetse, Opawole and Roshen, 2005). Similarly, (Murray and Lopez, 1998) indicated that despite the efforts of international health agencies to promote the home use of ORS, this intervention still remains an underutilized treatment in many areas of the developing world. Nathan (2004) stated that mortality from diarrhoea is often due to dehydration, which needs to be properly managed to reduce high mortality rates. Education on the use of oral rehydration solution (ORS) for the treatment of diarrhoea in the home is encouraged.

Surveys of caregivers in Sub-Saharan Africa have found wide differences in the awareness and utilization of ORS for treatment of childhood diarrhoea. According to Santosham *et al* (1996), up to 95% of two million children under the age of five who die annually as a result of gastroenteritis with dehydration can be treated successfully with oral rehydration therapy. There is more than enough evidence to show that an awareness and knowledge of the guidelines improve the use of ORT, as has been demonstrated by ORT programmes in America and Africa (Ozuah, Avner and Stein, 2002). In England, a study among paediatric nurses in acute admitting paediatric inpatient facilities revealed that only 74% of them were aware that ORT is the ideal choice of fluid for oral rehydration in moderate dehydration caused by diarrheal illness and only 54% identified ORT as the actual first-line fluid used (Messahel, 2008). The study conducted among mothers of under-five children showed that while only one-third of all respondents resorted to home-treatment of diarrhoea with ORS, more than 80% of them knew the components and composition of ORS solution (Omokhodion *et al*, 1998).

A study involving rural and urban residents drawn from Kanuri and Bura settlements in Northeastern Nigeria showed that awareness of oral rehydration therapy (ORT) was universal among participants, but knowledge of its function and the preparation of the sugar salt solution (SSS) were markedly deficient among the Kanuris, especially in rural areas. A similar study in

two states in Nigeria found that only 12.7% of people interviewed were able to correctly describe how SSS is prepared although almost all of them were aware of ORT (Ikpatt and Young, 1992). The findings of Jousilahti, Madkour, Lambrechts and Sherwin (1997) in a study among caregivers of under-five children in Egypt showed that 77.1% of them prepared ORS correctly. They however found that mean quantity of ORS which was 351 ml/child was probably too little for effective rehydration.

In a study in Nigeria however, Abiola, Ndaman, Idris, Jiya,and Ibrahim (2010) reported a high level of knowledge of home management of childhood diarrhoea using ORS/SSS among the study subjects. Similarly, in a study among mothers in Ibadan, South-west Nigeria, findings from the study revealed that 77.9% had adequate knowledge of ORT across all age groups of mothers and 78.3% rate of utilization. In the 2009 NPC, women are asked whether they knew about ORS packets in order to ascertain their knowledge of ORS. Overall, 66 percent of women know about ORS packets and knowledge was higher in urban areas (79 percent) compared with rural areas (60 percent). Also, among the geo-political zones, knowledge was highest among women in South-East (79 percent) and lowest in North Central (58 percent). The report also showed that mothers in the 35-49 age group (70 percent) had more knowledge about ORS than women in other age groups; and women age 15-19 were least knowledgeable (48 percent).

In a community based study, conducted on the understanding and knowledge of childhood diarrhoea and use of oral rehydration therapy (ORT) in Malaysia, Shaw, Jacobsen, Konare and Isa, (1990) reported that forty percent of care-givers had heard of the locally available ORT and 30% had actually used ORT. Of those who had heard of or used ORT, 10% had good knowledge of what it was and what it was used for. In a study to evaluate caregivers' knowledge of, attitudes to and use of homemade sugar and salt solution in South Africa, Dippenaar *et al* (2005) found out that 92.5% caregivers reported that they had been taught about sugar and salt solution (SSS). However, only 27% could recall the recommended method of eight teaspoons of sugar, half a teaspoon of salt and one liter of clean water. It is important to use the correct oral rehydration solution in order to rehydrate the child and to prevent hypernatremia, hyponatremia or osmotic diarrhoea.

A similar finding was reported in a study performed in Zimbabwe, where 72% of mothers had been taught about ORT, but only 21% could recall the correct recipe (Dippenaar *et al*, 2005). In Pakistan, a study among caregivers showed that knowledge of oral hydration salt (ORS) was low among uneducated mothers (Rehman, Ali, Khanum and Mehmood, 2009). This could mean education has a role to play in the treatment/management of diarrhoea. Pancharuniti *et al* (2004) found that most mothers who were interviewed in a survey among mothers of under-five children in Vietnam used ORS with their diarrhoeal children. They also practiced correctly in ORS preparation and preservation, in addition to preparation of well and easily digested children food. According to the results of the 2009 NPC, children with mothers who have more than a secondary education are most likely to receive some kind of ORT

2.10: Use of ORT among mothers/caregivers in treating diarrhoea

Though findings of some of the studies reviewed show a fairly high awareness of ORT, there is a deficit in the actual knowledge of its composition in most cases. Again, knowledge does not automatically translate into practice in most cases as there could be inhibiting factors which hinders the putting into practice of what is known. Hence, the needs to consider studies that have looked into the use of ORT in managing diarrhoea particularly among mothers/caregivers. In a study among mothers in Ibadan, South-west, Nigeria to find out whether their knowledge and practice of child survival strategies affect the nutritional status of their children, 78.3% stated they use oral rehydration therapy. In Mexico, findings from a study to determine mothers' health-seeking behaviour in acute diarrhoea showed that ORS was given only to 14.1% of the cases, and this therapy was more frequently used when the child showed signs of dehydration. Other surveys carried out in Brazil and Mexico has shown up to an ORS use of 6.8% and 45% respectively (Pérez-Cuevas, Guiscafré, Romero, Rodríguez, and Gutiérrez, 1998).

Low knowledge of mixing oral rehydration salts was identified as a risk factor for diarrhoea in a study in a rural area of Uganda. Rates of correct preparation of ORS and SSS in the home vary widely. In Nam Dinh City, Vietnam, half of the mothers of under-five children who were studied felt that ORS preparation was difficult and felt shameful to ask for any advice on diarrhoea treatment from health personnel. Pancharuniti *et al* (2004) now opined that if the

mothers would prepare ORS for their diarrhoea children correctly with inappropriate perceptions like these, it might lead or cause some opportunities for them to misuse ORS or use it with anti-biotic drugs and anti-diarrhoea drugs. This might lead them to have the appropriate but unsustainable correct practices.

There have been reports of the reluctance of health workers, people who are assumed to be knowledge enough, to use ORT in treating diarrhoea. Studies have shown that parents, physicians, and health workers are reluctant to use ORT in the management of acute diarrhoea in children (Gani, 1991; Ojuawo and Oyaniyi, 1993). One of the reasons for this low use rate could be attributed to the fact that ORT does not in actual fact stop diarrhoea. According to Ene-Obong, Uwaegbute and Iroegbu (2000) the management of diarrhoea diseases, particularly watery diarrhoea, with drugs continues among caretakers and health providers. Reasons given for not using ORT were that it was felt to be unpalatable or that it could not be used as it had to be ordered from the pharmacy first (Messahel, 2008). According to the (Murray and Lopez, 1998), health workers frequently fail to provide ORT or to advise caretakers to administer it at home and when ORS use is advised, there is often a greater emphasis on how to prepare ORS at home than on how much should be given, how long ORT should be continued, how to recognize severe dehydration, or the importance of continuing feeding during the diarrhoea episode.

Most authors observe that reasons for this difference include poor awareness amongst healthcare providers regarding ORT efficacy, easily available parenteral fluids, perceived lack of convenience in administering ORT and career expectations. Pérez-Cuevas *et al* (1996) in a study to determine mothers' health-seeking behaviour in acute diarrhoea in Mexico found out that the prevailing household treatment for diarrhoea is a combination of folk practices and cosmopolitan medicine. They concluded that this combination could be due to the influence that physicians and health providers have on the mothers. They added that the usual physicians' prescribing behaviour, hardly ever adequate to treat diarrhoea misleads people and motivates them to use potentially dangerous drugs, such as antibiotics that are usually not indicated. According to Jousilahti *et al* (1997), the message of ORS has penetrated into the general population well, but the practices of health professionals have not changed.

2.11: Risk factors associated with diarrhoea

Ekanem, Adedeji and Akitoye (1994) in a study on the environmental and behavioral risk factors for prolonged diarrhoea in Nigerian children documented that food bought from street vendors was associated with prolonged diarrhoea. Also, the age of a child, quality of water, environmental sanitation, parental education, household size, and birth interval have been identified as risk factors for children in a rural area of Zaire (Manun'ebo, Haggerty, Kalengaie, Ashworth and Kirkwod, 1994). Similarly, in Burkina Faso, West Africa faecal disposal was associated with diarrhoea or dysentery among children. A study by Mbonye (2004) among children in a rural area of Uganda showed that the following were strongly associated with diarrhoea. They include the immunization status of a child, knowledge of a mother on how to mix ORS, a child having had a previous episode of URTI, absence of latrine in the house, garbage thrown anywhere in the compound, not washing hands before preparing food, source of drinking-water obtained from water/river streams and water obtained from stagnant water in ponds and wells.

The findings of the 2008 Nigeria Demographic Health Survey showed that diarrhoea was more prevalent among children whose households do not have an improved source of drinking water (12 percent), compared with households that have an improved source of drinking water (8 percent). According to PATHS (2009), children at greatest risk are those who may be malnourished and lack access to clean water, proper sanitation, and urgent medical care. A WHO report on global water supply provides worrisome figures of current and future scenarios for Africa (WHO 2000). Of all the regions in the world, the African region was the only one showing a decline in the proportion of the population that had access to sanitation between 1990 and the year 2000. Approximately 50 percent (300 million individuals) of the African population have no access to safe water, and 66 percent (400 million individuals) lack access to hygienic sanitation. It is expected that by the year 2020 these figures will rise to 400 million and 500 million, respectively (Boschi-Pinto *et al*, 2006). A report by PATHS (2009) stated that deaths from diarrhoea disproportionately target the poor due to: poor environmental sanitation, inadequate water supply, poverty and limited education.

Studies conducted in Burkina Faso and some other West African countries identified source of drinking-water, personal hygiene, disposal of garbages, and absence of latrine as risk factors for diarrhoea among children (Traore, Cousens, Curtis, Martens, Tall and Traore, 1994; Getaneh, Assefa and Tadesse 1997; Sodemann, Jakobsen, Molbak, Martins and Aaby 1999). Similarly, a study in southwestern Ethiopia identified immunization status of a child, father's ethnicity, family income, and availability of latrine as risk factors for diarrhoea among children aged 6-59 months (Teklemariam, Getaneh and Bekele 2000).

According to Pérez-Cuevas *et al* (1996) regarding acute diarrhoea, the reported risk factors for an adverse outcome include the following: lack of information to identify complications, such as dehydration; limited use of oral rehydration solutions; inadequate maternal health-seeking behaviour and dietary modifications, such as restricting certain foods or breastfeeding. Zodpey, Deshpande, Ughade, Hinge and Shirikhande (1998) identified 12 risk factors for the development of moderate or severe dehydration in children with acute watery diarrhoea in India. These factors included: age under 12 months, Muslim religion, severe under-nutrition, non-washing of hands by the mother before food preparation, more than 8 stools per day, more than 2 vomiting episodes per day, a history of measles in the previous 6 months, withdrawal of breast-feeding during diarrhoea, withdrawal of fluids during diarrhoea, not giving home-available fluids during diarrhoea, not giving oral rehydration solution (ORS) during diarrhoea, and not giving both home-available fluids and ORS during diarrhoea. Similarly, a study in India identified the withdrawal of fluids not giving ORS or both during diarrhoea in the outcome of development of moderate or severe dehydration.

A study in Uganda, combining both rural and urban districts, has demonstrated that education of a mother is negatively associated with the risk of a child getting diarrhoea and URTIs. Children born to mothers with secondary education and above are less likely to suffer from diarrhoea and URTIs and are likely to receive immunization and benefit from better healthcare (Uganda Bureau of Statistics, 2001). Similarly, in Nigeria, lower diarrhoea prevalence was associated with children of mothers with higher levels of education and those living in households in the highest wealth quintile (each 5 percent) (NPC, 2009). Some studies have also identified a few family characteristics as protective factors. These are monogamy of the father, defined residential area (Vaahtera, Kulmala, Maleta, Culliman, Salin

and Ashorn, 2000), having a private kitchen, and being cared for by the mother (Oni, Schumann and Oke 1991).

2.12: Conceptual Framework

Health Belief Model (HBM)

The Health Belief Model (HBM) was one of the first theories of health behavior, and remains one of the most widely recognized in the field. It was developed in the 1950s by a group of United State Public Health Service social psychologists who wanted to explain why so few people were participating in programs to prevent and detect disease.

They theorized that people's beliefs about whether they were or not susceptible to disease, and their perceptions of the benefits of trying to avoid it, influenced their readiness to act. A heavy component of the behaving individual's perceptional world and motivation was incorporated into the Health Belief Model by its developers. The model is interactive as each step influences the others, and is based on three primary dimensions. In ensuring years, researchers expanded upon this theory, eventually concluding that six main constructs influence people's decisions about whether to take action to prevent screen for, and control illness.

They argued that people are ready to act if they:

1. Believe they are susceptible to the condition (perceived susceptibility)
2. Believe the condition has serious consequences (perceived severity)
3. Believe taking action would reduce their susceptibility to the condition or its severity (perceived benefits)
4. Believe costs of taking action (perceived barriers) are outweighed by the benefits
5. Are exposed to factors that prompt action (e.g., a television advertisement) (cues to action)
6. Are they confident in their ability to successfully perform an action (self-efficacy)

Since health motivation is its central focus, the HBM is a good fit for addressing problem behaviors that evoke health concerns (e.g., high-risk sexual behavior and the possibility of contracting HIV).

2.12.1: Application of the Health Belief Model on nursing mother's knowledge and capacity to manage diarrhoea using ORT

Perceived susceptibility: The belief that diarrhoea exists; that U-5 children are at risk of diarrhoea infection; belief that they can be infected with diarrhoea through dirty surrounding and dirty eating habit; belief that U-5 children are perceived to be susceptible to diarrhoea because their immune system is not fully developed.

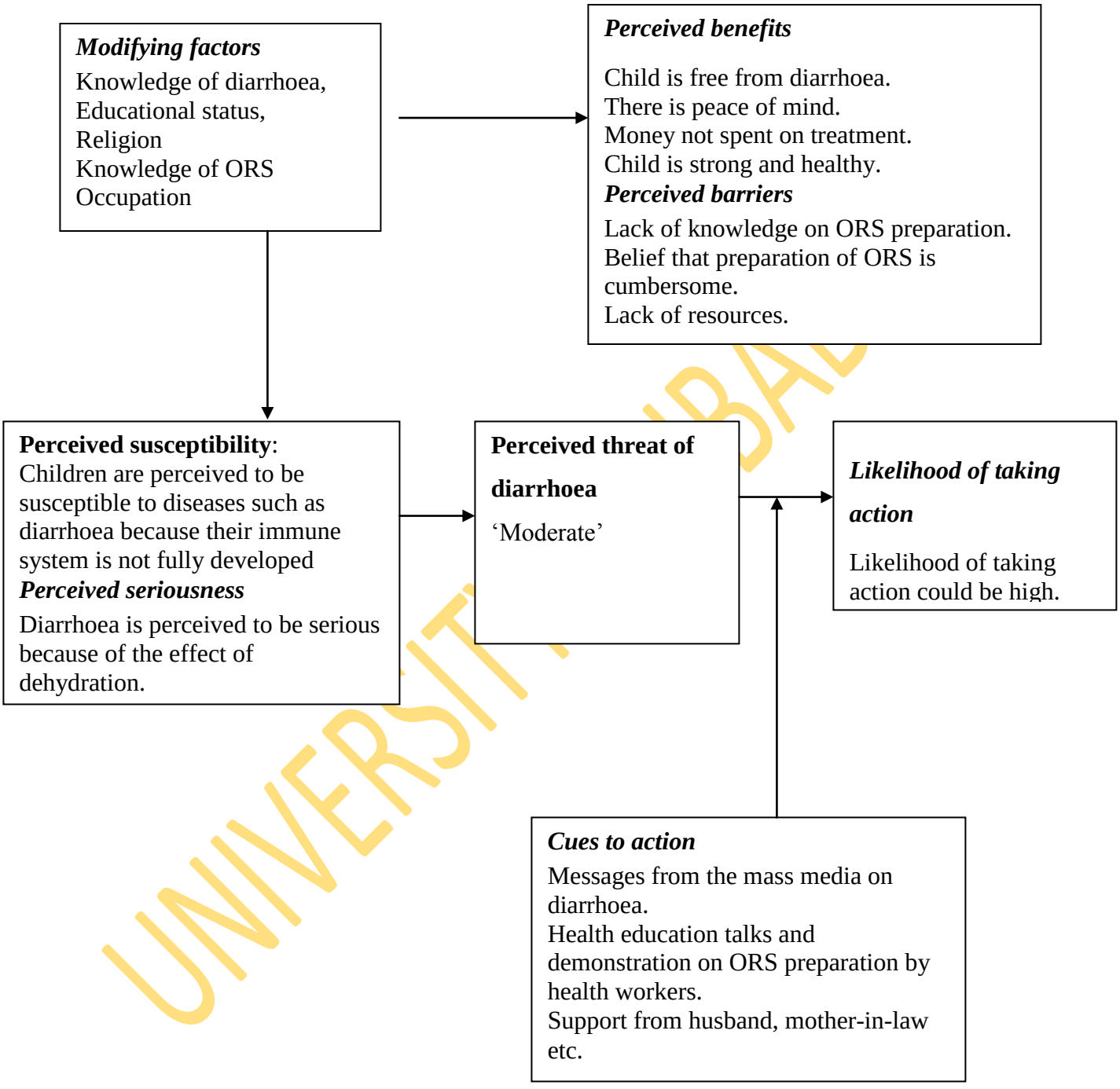
Perceived severity: Belief that diarrhoea disease is a serious disease that causes other diseases and death. Belief that not knowing the symptom of diarrhoea can cause serious consequences and death of U-5 children. There already exists the belief that diarrhoea is a killer disease among children.

Perceived benefits: Belief that taking action would reduce their susceptibility to the condition or its severity. If nursing mothers belief that going to health facilities or using ORS preparation would help them reduce severity of the disease and children to be free of diarrhoea. Nursing mothers are likely to have positive attitude towards ORS usage.

Perceived barriers: Belief about the maternal and psychological cost of taking actions. The perceived barriers could be that preparation of ORS is cumbersome and lack of knowledge on ORS preparation. If these perceived barriers outweigh the benefits, they could influence the negative use of ORS by nursing mothers.

Cue to action: Factors that can prompt positive use of ORT and action could be health education talks and demonstration on ORS preparation by health workers, messages in the mass media on diarrhoea and support from husband and mother-in-law.

Figure 2.1: The Health Belief Model as applied to the nursing mothers' knowledge and capacity to manage diarrhoea using ORT



CHAPTER THREE

METHODOLOGY

3.1: Study design

The study was a cross sectional survey. The study assessed the knowledge on diarrhoea, oral rehydration therapy, preventive method of diarrhoea and home management of diarrhoea among mothers of U-5 children.

3.2: Study area

The study was carried out at Odogbo Military barracks in Akinyele Local Government area Ibadan, Oyo State, Nigeria. The barrack was founded in 1972 named Adekunle Fajuyi Military cantonment Odogbo, Ibadan. The barrack is the second largest barrack in Nigeria with 23 units namely; 2 Div garrison units, Medical, Supply and transport, Ordinances services, Equipment support, Central ordinate (Mechanical & Technical), Intelligent group, Provost group, Education, Finance, Physical training, Cantonment maintenance, Legal services, Patrol oil lubricant (POL) reserve, Printing press, 2Div Hospital and Band.

Adekunle Fajuyi has two secondary schools namely Command Secondary School and Command day Secondary School. There are two churches in the cantonment the Roman Catholic with a chaplain as the head and the Protestant. The Islamic affairs also exist in the barrack.

The Garrison unit is the residing area of the barrack and is headed by a commandant, it was divided into three unit namely; 48 soldiers blocks, each block contains 30 rooms, making a total of 1440 rooms, 214 senior non commission blocks and 107 officers block.

The total population of people working in the barrack is about 3000 (records department, Odogbo Army barrack, 2009) but some of them reside in Mokola barrack while some stay off the barrack.

3.3: Study population

The study population consisted of mothers of under-five children residing in the barrack because knowledge of mothers in the Nigerian army barracks relating to the use of ORT have not been fully studied. Mothers of under-five children on a visit to Odogbo Army barrack were excluded from the study.

3.4: Sample size determination

The sample size was determined using EPI INFO statistical package 6.04, the following parameters were utilized for the calculation.

Formula: Sample size = n/(1-(n/population))

n= Z*Z (P(1-P))/(D*D)

n = Size of the population 3000

D = Desired precision 0.5

P = National prevalence of ORT 0.23(according to NPC, 2009)

Design effect 1.0

Z = Confidence Level 99%

Sample size 403

3.5: Sampling Technique

A two stage sampling technique was used for this study. It involved the following stages.

Stage 1: Using stratified random sampling, the barrack residents were stratified into soldiers quarters, Non commission quarters and Officers quarters.

Stage 2: Using a systematic random sampling a total of 403 mothers of under-five years were selected from all the 48 soldiers blocks (1440 rooms), 216 non commission blocks and 107 officers blocks every fourth rooms were selected from the soldiers' quarters' stratum while fourth building were selected from the Non commission blocks and Officer block strata respectively. Soldiers quarter (299 mothers.) Non commission block (71 mothers) and Officers block (33 mothers). In each selected household the questionnaire was administered to a consenting mother of under-five who met the criteria for the study.

3.6: Pretest of the instrument

The questionnaires were pretested in Mokola Military barrack Ibadan in the month of May 2009. Mokola barrack was chosen as the pretest site due to the similarity it shares with the study site in terms of socio-economic, religious and other characteristics. Just as it is with the study site, residents in the pretest site are also segregated along the Soldiers, Non Commission and Officers wives strata. During the pretest, 40 participants voluntarily participated in the study, more participants were recruited in the evenings and weekends than at other periods.

The pretest helped the researcher to determine the trend in the response of participants and the amount of time it took to administer the questionnaire. The level of comprehension of the items by the participants was also determined. At the end of the exercise, items that were not easily understood were reframed, those that were found to be irrelevant were removed, adequate spaces were provided for responses, and some questions were added while the items were rearranged to follow logical sequence. The pretest questions were then analyzed using the SPSS version 15.

3.7: Procedure for data collection

Instruments were modified and standardized after which two research assistants were trained for data collection. The research assistants were trained in the following areas; the objectives of the study, basic facts on sampling procedure as well as a review of the instruments item by item in order to ensure adequate understanding of the instruments, appropriate recording of responses and seeking clarification in case of unclear responses, communication skills. In addition, ethical issues such as obtaining informed consent, respect for privacy and confidentiality of information were explained to the research assistants.

The research assistants with the researcher were involved in the collection of the data. Data collection took place in the month of June 2009 mostly in the evenings on week days and in the mornings and evenings of weekend days when it was easier to get the participants. The filled questionnaires were submitted to the researcher at the end of each day of the period of data collection and were screened before the research assistants left. Short debriefing sessions were also held at the end of each day where the day's work was reviewed and the next plan of action disseminated to the research assistants.

3.8: Validity

Validity, which is the ability of a test or an instrument to measure what the investigator wants to measure, was ensured by the following steps:

1. A draft of the questionnaire was constructed by consulting relevant literature
2. The draft instrument underwent an independent review from peers and experts in the field of public health.
3. Supervisor's review was used in fine-tuning the instrument.

3.9: Reliability

Reliability describes the accuracy or precision of a research-measuring instrument. Special care was taken to monitor the quality of data collected through supervision during collection of data. The questionnaires were reviewed for quality and consistency. It was pre-tested on the mothers of under-five residing at Mokola barrack to ensure reliability of results that will be obtained from the study. The reliability of questionnaire was tested using the Alpha Cronbach's reliability test and the result was 0.8 which was interpreted as reliable.

3.10: Inclusion Criteria

The main criteria for inclusion in the study are that respondents must be mothers of under-five and resident in the barrack.

3.11: Data collection method

In this study, quantitative method of data collection was adopted using interviewer-administered questionnaires to ensure good quality of data.

The pre-test findings were used in modifying some aspects of the questionnaire in order to make it more encompassing in addressing the study objectives. The semi-structured questionnaire, which was interviewer-administered, was divided into five (5) sections namely: demographic characteristics, knowledge of diarrhoea and prevention, knowledge of oral rehydration therapy and home management of diarrhoea. The modified questionnaire was then administered to the selected participants.

3.12: Data processing

The Questionnaires were sorted to identify incorrectly filled questionnaire and same were removed. After the sorting, 403 questionnaires were serially numbered and used to develop

the coding guide; responses were coded and used in the development of a data dictionary. The data were entered into the computer through the Statistical Package for Social Sciences (SPSS) for analysis.

The filled questionnaires were serially numbered for easy identification and sorted out. An appropriate coding guide was prepared and the questionnaires were coded using this coding guide while some of the items of the questionnaires were scored. The data were then entered into the computer for cleaning and statistical analysis. The SPSS version 15 was used in analyzing the data. Frequencies were generated for all the variables while some items were cross tabulated with other variables to determine the strength of their relationship. The Chi-square and descriptive statistics were used in the analysis of the data. The results were presented in tables.

Knowledge variables were scored: From a total maximum knowledge score (on preventive of diarrhoea) of 20 points, each correct answer had a score of 2, an incorrect answer or no response had a score of 0. The scores were then summed up to give a composite knowledge score for each respondent. Knowledge of respondents was categorized into poor (0-8 points), fair (9-13 points) and good (14-20 points) grades. From a total maximum of knowledge score (about Oral Rehydration Therapy) of 16 points, each correct answer had a score of 2 and an incorrect answer or no response had a score of 0. The scores were then summed up to give a composite knowledge score for each respondent. The maximum obtainable score is one. Knowledge score was categorized into poor (0-5 points), fair (6-10 points) and good (11-16 points) grades.

Data storage: all the questionnaires were packed in bundles according to the serial numbers and kept in a safe cabinet to ensure safety and maintain confidentiality. More so there may be need to refer to them in the course of the research process.

3.13: Ethical considerations

A letter introducing the researcher and the purpose of her research work was obtained from the Department of Health Promotion and Education, for all official contacts throughout the period of fieldwork. The officers in charge of the barrack were met and verbal approval obtained before proceeding for any interview at the study and pre-test sites. The purpose of

this study was duly explained to the participants in the language they understood and informed verbal consent obtained before interview. Participation was voluntary and no form of coercion was used. There was no undue influence on the participants. Participants were assured of the confidentiality of all information obtained from them and respondents' names were not written on the questionnaire in order to ensure anonymity.

CHAPTER FOUR

RESULTS

The results of the quantitative data from the study are presented in this chapter. It consists of socio-demographic characteristics, knowledge about diarrhoea diseases, prevention of diarrhoea, knowledge about oral rehydration therapy and home management of diarrhoea.

4.1: Socio-Demographic Characteristics

The ages of respondents ranged from 17 to 47 years with a mean of 29.8±5.5 years. Almost half of the respondents (47.1%) were in the 20 and 29 years age group. Majority (62.3%) had secondary education while 22.1% had primary education. Forty-three percent were petty traders, 35.9% were full house-wives and 12.9% were artisans (Table 4.1).

Table 4.1: Socio-demographic profile of the respondents (N=403)

Demographic Information	Frequency	Percentage
Age		
10-19years	5	1.2
20– 29 years	190	47.1
30– 39 years	184	45.7
40 – 49 years	24	6.0
Religion		
Christianity	254	63.1
Islam	142	35.2
Traditional	7	1.7
Marital Status		
Married	400	99.3
Divorced	2	0.5
Widow	1	0.2
Occupation		
Petty trading	172	42.7
Housewives	144	35.7
Artisan	52	12.9
Civil Service	13	3.2
Teaching	7	1.7
Farming	6	1.5
Others(auxiliary nurse, Students)	9	2.2
Ethnicity		
Hausa	159	39.5
Igbo	123	30.5
Yoruba	117	29.0
Others	4	1.0
Educational Level		
No formal education	24	6.0
Primary education	89	22.1
Secondary education	251	62.2
Tertiary education	39	9.7
Number of Children		
One child	77	19.1
Two children	128	31.8
Three childrenl	99	24.6
Four children	65	16.1.
Five children	19	4.7
Six children	14	3.5
Seven children	1	0.2

4.2: Knowledge of diarrhoea among respondents

The entire respondents (100.0%) have heard about diarrhoea diseases. Sixty-Six percent of the respondents heard information about diarrhoea from health personnel (Table 4.2). At what stage is the child most likely to develop diarrhoea, 56.6% specified teething period (Table 4.3). Sixty percent of the respondents were able to identify gonorrhea diarrhoea as incorrect type of diarrhoea, 6.7% bloody diarrhoea, 5.2% persistent diarrhoea while 3.0% indicated acute watery diarrhoea. Eighty-three percent of the respondents were able to identify cough as incorrect symptoms of diarrhoea, 2.0% specified noise in the stomach 1.7% stated high temperature and loss of appetite respectively while 1.5% indicated stooling.

Table 4.2: Sources of Information about diarrhoea by respondents

Sources of lnformation	**Frequency**	**Percentage**
Health personnel	266	66.0
Relatives	54	13.4
Neighbour	23	5.7
Personal Experience	22	5.5
Television	19	4.7
Radio	11	2.7
School	8	2.0
Total	**403**	100

Table 4.3: Respondents opinions of occurrence diarrhoea at different stages of development

*Stages	Frequency	Percentage
Teething	228	56.6
Any stage	57	14.1
Sitting	43	10.7
Walking	39	9.7
Crawling stage	6	1.5
Schooling age	4	1.0
Don't know	26	6.5
Total	**403**	100

*Multiple response question

Knowledge about causes of diarrhoea and its seriousness

Majority of the respondents (51.6%) stated that teething is a cause of diarrhoea and 38.2% associated dirty environment as a cause (Table 4.4). Almost half of the respondents (46.4%) agreed that diarrhoea is a very serious disease, (40.9%) indicated serious while (9.4%) stated not serious 3.2% had no idea.

Table 4.4: Causes of Diarrhoea (N=403)

Causes	Frequency	Percentage
Teething	208	51.6
Dirty environment	154	38.2
Contaminated food	69	17.2
Contaminated water	48	11.9
Lack of personal hygiene	17	4.2
Sugary or sweet food	17	4.2
Flies	8	1.9
Undigested food	3	0.7
Dirty feeding bottle	2	0.4
No idea	47	11.6

**Multiple responses included*

4.3: Prevention of diarrhoea

Majority (77.2%) of the respondents disagreed with washing hand without soap while preparing food for the child while 21.3% agreed. Almost Ninety-seven percent agreed with ensuring water is clean before giving the child while 3.2% disagreed. More than half 64.5% agreed with early treatment of the child can help prevent diarrhoea complications. (see table 4.5). The mean knowledge score of respondent for the prevention of diarrhoea was 13±2.4.

Table 4.5: Knowledge of prevention of diarrhoea

Statements	True (%)	False (%)	Don't know (%)
Washing of hands without soap while preparing food for the child * *	86(21.3)	311(77.2)	6(1.5)
Using plate which has been used by other person without washing can prevent diarrhea**	66(16.4)	334(82.9)	3(0.7)
Mother should always change her cloth on daily basis to avoid diarrhoea *	373(92.5)	25(6.2)	5(1.2)
Ensuring that the water is clean before giving the child *	390(96.8)	13(3.2)	-
Exclusive breast feeding of the child prevent diarrhoea *	285(70.7)	87(20.1)	37(9.2)
Cooking child's food where uncovered refuse is close **	55(13.4)	340(84.4)	8(2.0)
Early treatment of the child can help prevent diarrhoea complication *	260(64.5)	89(22.1)	54(13.4)
Eating of sand while crawling**	39(9.7)	254(63.0)	110(27.3)
Disposal of faeces including those of infants around the House **	48(11.9)	348(85.6)	10(2.5)
Using unclean infant feeding bottles **	45(11.2)	351 (87.1)	7(1.7)

Correct response*

Incorrect response **

4.4: Respondents' knowledge of Oral Rehydration Therapy

A large percentage of the respondents (98.3%) heard about Oral Rehydration Therapy (ORT). Ninety-three percent of the respondents agreed with the statement that ORT is used for the home management of diarrhoea, while 1.5% disagreed. Most of the respondents (80.1%) heard of ORS from Health personnel (Table 4.6). Majority of the respondents (87.3%) stated that ORT consists of Sugar, Salt and Water (see table 4.7). Twenty-seven percent of the respondents had good knowledge of ORT, 63.3% of the respondents had fair knowledge while 9.9% of the respondents had poor knowledge of ORT. The mean knowledge score of respondents for oral rehydration therapy was 7.61±1.76.

The best option for giving Oral Rehydration Solution (ORS) to a child who has diarrhoea, 82.9% indicated cup and spoon, 7.7% feeding bottle while 8.9% had no idea. Majority of the respondents (65.3%) knew when the unused prepared solution of ORS should be thrown away that is within twenty four hours. Eighty-six percent agreed that ORS should be given with other food while 6.2% disagree and 7.2% did not know.

Table 4.6 Sources of ORS Information (N=396)

*Sources	Frequency	Percentage
Health personnel	317	80.1
Relatives	46	11.6
Television	24	6.1
Radio	5	1.2
School	4	1.0
Total	**396**	100

*Multiple response question

Table 4.7: Respondents' knowledge about Oral Rehydration Therapy (ORT)

(N=396)

Variable	Frequency	Percentage
Oral rehydration is used for the home management of diarrhoea		
True*	370	93.4
False	6	1.5
Don't know	20	5.1
The content of ORT		
Salt, Sugar and Oil	7	1.7
Salt, Sugar and Water*	346	87.3
Salt, Sugar and Palm wine	37	9.4
Don't know	6	1.5
Amount of sugar to salt		
5cubes of sugar to1Lteaspoon salt*	177	44.7
4:2	42	10.6
8:5	25	6.3
WHO prepared sachet	12	3.0
6:3	11	2.7
10:4	9	2.3
5:5	3	0.8
Don't know	116	29.3
Quantity of water		
One beer bottle*	251	63.4
One fanta bottle	84	21.2
One 75cl eva water	19	4.8
One litre water	15	3.7
One glass cup	3	0.7
One bowl of water	2	0.5
Don't know	24	6.1
Other things that can be used as ORT		
Pap water	26	6.5
Coconut water	19	4.8
Gari water*	14	3.5
Native medicine	10	2.5
Raw fufu	4	1.0
Rice water	3	0.7
Juice	2	0.5
Saline and gripe water	1	0.2
Don't know	315	79.9

Key * = correct answers

4.5: Home management of diarrhoea

This section provides the results of respondents' home management of diarrhoea. Majority (79.9%) of the respondents agreed that their child had diarrhoea and 21.1% said the child has never had diarrhoea. Sixty-six percent had teething diarrhoea while 30.1% had watery diarrhoea (Table 4.8). Majority (61.8%) of the respondents gave ORS as first home treatment while 4.6% gave native medicine (Table 4.9). Respondents' response to the last time they prepare ORS 35.4% said 1-11months (Table 4.10). Majority (79.6%) took their children to the military hospital within the barracks, 16.1% private hospital, 1.7% traditional healer, 1.4% chemist while 1.1% said UCH.

Table 4.8: Types of diarrhoea mentioned by respondents

Types of diarrhoea	Frequency	Percentage
Teething	211	65.5
Watery	97	30.1
Dysentery	14	4.4
Total	**322**	100

Table 4.9: Types of Home treatment given by respondents

*Type of home treatment	Frequency	Percentage
ORS/Salt Sugar Solution	199	61.8
Orthodox medicine	91	28.3
Nothing	16	4.9
Native medicine	15	4.6
Gari water	1	0.3
Total	**322**	100

*Multiple response question

Table 4.10: When was the last time respondent's prepared ORS (N=280)

Last prepared ORS	Frequency	Percentage
1-11 months	99	35.4
12-23 months	89	31.8
24 months and above	92	32.8
Total	**280**	100

The respondents were asked in case their child had diarrhoea, how could they manage it, majority (72.7%) stated that they will take the child to the hospital while 18.4% said they will give ORS (Table 4.11). Reasons given for choosing the treatment options 52.1% stated for proper treatment while 2.2% of the respondents stated that traditional medicine is more effective (see table 4.12).

Table 4.11: Reported intention on how diarrhoea will be managed

***Management of diarrhoea**	**Frequency**	**Percentage**
Taking the child to Hospital	293	72.7
Giving ORS	74	18.4
Giving orthodox medicine	22	5.5
Giving traditional	12	3.0
Giving breast milk exclusively for six months	2	0.3
Total	**403**	100

*Multiple response question

Table 4.12: Reasons for choosing the treatment options

*Reasons	Frequency	Percentage
For proper treatment	210	52.1
To prevent weakness/dehydration	52	12.9
Orthodox medicine works faster	31	7.6
Traditional medicine is more effective	9	2.2
ORS is the best and very effective	14	3.4
Doctors knows the best	58	14.4
Self treatment is not good	28	6.9
Breast milk prevents diarrhoea	2	0.5
Total	**403**	100

*Multiple reason question

4.6: Respondents' suggestions for preventing diarrhoea among under-five children

Respondents' suggested measures for preventing diarrhoea are shown in Table 4.13. About 66.0% percent of the respondents suggested environment should always be clean, 6.9% of the respondents suggested breastfeeding of the child, 4.4% proper washing of the breast.

Table 4.13: Suggestions for the preventing diarrhoea among children 0-5 years

(N=403)

Suggestions	**Frequency**	**Percentage**
Environment should always be cleaned	266	66.0
Mothers should be neat with feeding utensils	100	24.9
Mother should give adequate diet	55	13.6
Avoid contaminated food	51	12.6
Washing of hands before and after toileting	41	10.1
Breastfeeding of the child	28	6.9
Proper washing of the breast	18	4.4
Children should not eat sugary or sweet things	14	3.5
Hand washing after playing	10	2.4
Water must be cleaned	6	1.5
No suggestion	153	38.0

**Include multiple responses*

4.7: Test of hypothesis

Hypothesis One

Educational level of the respondents and knowledge of diarrhoea were cross tabulated to determine if Educational level had an influence on diarrhoea knowledge. Table 4.14 shows that there was no significant association between Educational level of respondents and knowledge of diarrhoea ($p<0.05$).

The hypothesis that stated that there is no significant association between education level of participants and their knowledge of diarrhoea was rejected.

Hypothesis Two

The second null hypothesis which stated that there is no significant association between parity of the mothers and diarrhoea management practices among respondents. Table 4.15 shows the cross tabulation of parity of the mothers and diarrhoea management practices among respondents.

There was a significant association between parity of the mothers and diarrhoea management practices; therefore the null hypothesis was not rejected.

Hypothesis Three

Perceived seriousness of diarrhoea and diarrhoea management practices among respondents were cross-tabulated to determine if perceived seriousness had an influence on diarrhoea management. Table 4.16 shows that there was a significant association between perceived seriousness of diarrhoea and diarrhoea management practices ($p<0.05$). Perceived seriousness has a role to play in diarrhoea management.

The hypothesis that stated that there is no significant association between perceived seriousness of diarrhoea management practices was not rejected.

Hypothesis Four

Knowledge and use of oral rehydration therapy among respondents were cross-tabulated to determine if knowledge had an influence on the use of oral rehydration therapy. Table 4.17 shows that there was a significant association between knowledge and use of oral rehydration therapy.

There is no significant association between knowledge and use of oral rehydration therapy, therefore the null hypothesis was rejected.

Table 4.14: Association between educational level and knowledge of diarrhoea

Educational attainment	**Knowledge of diarrhoea**			
	Poor	**Fair**	**Good**	**Total**
No formal	12	6	6	24
Primary	11	53	25	89
Secondary	25	165	61	251
Tertiary	2	21	16	39
Total	50	245	108	403

$\chi 2 = 6.138$

df= 6

P-value=0.408

Table 4.15: Association between parity of the mothers and practices of diarrhoea management

Parity	Practices of diarrhoea management		
	Used ORS/SSS	**Used other methods**	**Total**
One child	30	47	77
2-4 children	152	140	292
>5	17	17	34
Total	199	204	403

$\chi 2 = 26.18$

df= 10

P-value=0.003

Table 4.16: Association between perceived level of seriousness and ORS/SSS used.

	Used ORS/SSS	**Used other methods**	
Serious	70	95	165
Very serious	114	71	185
Not serious	12	25	40
Don't know	3	10	13
Total	199	201	403

$\chi 2=22.11$

df=3

P-value=0.000

Table 4.17: Association between knowledge and use of Oral Rehydration Therapy

	Used ORS/SSS	**Used other methods**	
Good	47	39	86
Fair	136	137	273
Poor	16	28	44
Total	199	204	403

X^2 =4.178

df=3

P-value=0.243

CHAPTER FIVE

DISCUSSION

5.1: Socio-demographic characteristics

Majority of the respondents were in the 20 and 29 years age group. The minimum and maximum ages are 17 and 49 years with a mean age (SD) of 29.8±5.5 years. The participants are within the reproductive age (NPC, 2009). The religious affiliation of the respondents revealed that there were more Christians than Moslems in the study population. Less than half of the study population was Hausa followed by Igbo and this could be explained because the study population is in an army barrack where different tribes reside. A good number were traders. This is similar to the characteristics of the study population by Abiola, Ndaman, Idris, Jiya and Ibrahim (2010) study which stated that majority of the study population were traders and engaged in home based industries like trading in neighborhoods markets and shops. The greater percentage of the respondents were petty traders this may be due to the fact very few of them had tertiary education. Hence they do not qualify for white collar jobs.

5.2: Knowledge of Respondents on diarrhoea diseases

All the respondents have heard about diarrhoea disease and Health personnel were their major source of information. This is similar to the characteristics of the study population by Abiola *et al* (2010), study which stated that two-thirds of the study population knew correctly what diarrhoea is. This implies that respondents got information about diarrhoea disease from Health personnel. This prepared them to be able to give first aid treatment to their under-five children.

More than half of the respondents believed that teething causes diarrhoea. This is similar to the characteristics of the study population by Othero et al (2008), study which observed that less than half of the study population believed that false teeth causes diarrhoea. This implies that most mothers and caregiver still believed that it is a must for a child to have diarrhoea during teething or false teeth; this is their belief for the past decades.

An appropriate channel of communication also plays a crucial role in enhancing acquisition of knowledge. Health personnel were observed to be respondents' major source of information on diarrhoea. Concerning the educational level of respondents, it was found that few of them had tertiary education. This low percentage of tertiary education could be explained by the lack of white collar jobs.

5.3: Knowledge of Respondents on Oral rehydration therapy

Majority of respondents agreed that oral rehydration is used for home management of diarrhoea. This is similar to the characteristics of the study population by Kosek *et al* (2003), study which observed that ORT is the best treatment for rehydrating patients with acute infectious diarrhoea. ORT is a simple lifesaver, this suggests that mothers were likely to have more health care knowledge to protect their children and deal with these conditions more effectively. Majority of respondents knew the content of ORT as salt, sugar and water and can prepare it. This is contrary to Dippenaar *et al* (2005), study which observed that only few people of the study population were able to describe how SSS is prepared although almost all of them were aware of ORT. The current finding may be the result of emphasis on the issue over time.

The mean knowledge score of respondents for oral rehydration therapy was fair (7.6±1.8). This is similar to the characteristics of the study population by Ozuah *et al* (2002), study which observed that an awareness and knowledge of guideline improves the use of ORT. Ability to identify an episode of diarrhoea could be function of education, as being literate could help a mother to be exposed to information that would make her aware of various childhood diseases and steps to take.

It was encouraging to discern the positive influence that maternal education status played on diarrhoea. Other studies have shown that maternal education plays a role in the decision to manage diarrhoea. Majority of the respondents heard about ORT. A study by Rehman Inayat Shukr, Salman Ali Tahira Khanum,Tahir Mehmood (2009), observed that knowledge of oral hydration was low among uneducated mothers. These mean that education has a role to play in the treatment and management of diarrhoea. Education has a role to play in the treatment and management of diarrhoea. According to the results of the 2009 NPC, children with

mothers who have more than a secondary education are most likely to give or receive some kind of ORT.

5.4: Preventive methods of diarrhoea adopted by mothers

Majority of the respondents were in support that disposal of faeces including those of infants around the house can cause diarrhoea. This implies that their knowledge on faeces disposal and the harm it can cause to children is known to most of the respondents. This is in line with Sanusi and Gbadamosi (2009); Limlim (2008), studies which observed that poor sanitary environment has been suggested as one of the reasons why diarrhoeal disease and consequently dehydration is so common in Nigeria.

Majority of the respondents agreed that "ensuring that water is clean before giving the child". This is similar to the characteristics of the study population by Root (2001), study which observed that exposure to diarrhoeal pathogen is conditioned by a variety of household environmental factors particularly water and toilet facilities. Identification of personal hygiene practice, environmental factors and immunization status of a child as risk factors for diarrhoea implication in designing appropriate prevention strategies.

The mean knowledge score of respondents for prevention of diarrhoea was high. Knowledge does not automatically translate into practice (prevention) in most cases as there could be inhibiting factors which hinders the practice of what is known. In the time past, provision of health care was primarily considered the domain of health providers. However the current trend has recognized the importance of mothers and the family in identifying, caring for and preventing children's illness.

5.5: Diarrhoea management practices

More than half of the respondents gave ORS/salt solution for home treatment management. This is similar to the characteristics of the study population by Messahel, 2008; Omokhodion, 1998, studies which observed that almost all the study population were aware that ORT/salt solution is the ideal choice of fluid for oral rehydration. In the past, provision of health care was primarily considered the domain of health providers. However the current trend has recognized the importance of mothers and the family in identifying, caring for and preventing children's illness.

More than half of the respondents used ORT/salt for home management of diarrhoea. This implies that the respondents believed so much in ORT and salt solution because it is effective and safe. This is contrary to Amy *et al* (2007), study in Southern Mali which observed that nearly all parents in the study group knew ORT/salt could replace lost fluids, its inability to stop diarrhoea caused parents to seek antibiotics from local markets and traditional treatment of diarrhoea. One of the reasons for this low rate could be attributed to the fact that ORT/salt does not in actual fact stop diarrhoea.

Two-thirds of the respondents know the correct treatment for the home management of diarrhoea. This is similar to the characteristics of the study population by Abiola *et al* (2010), study which observed that a great proportion of those who managed diarrhoea at home know that the child health condition improved after the treatment of ORT/SSS. Apart from the issue of being able to recognize the signs and symptoms of diarrhoea, the position of the woman in the household, as well as the decision making power also plays a role. The use of ORT is associated with a mother's ability to allocate time to health care and her general position in the household since mothers' in-law and husband also made decisions on the management of sick children at home.

5.6: Implications of the finding for Health Promotion and Education

The findings of this study have several implications for planning, developments and implementation of diarrhoea prevention programmes in Odogbo army barrack and other army barracks in Nigeria at large. The responsibility of Health Education focuses on the modification of people's behaviour and behavioural antecedents. Health Education is concerned with helping people develop practices that ensure their best possible well-being (WHO, 1988). It is concerned with reinforcing and changing knowledge attitude and behaviour of people through effective communication of factual information with the aim of helping them to ensure an optimum well-being. Health Education can therefore be used to bridge the gap between health information and health practices within the context of diarrhoeal. Health education principles and strategies can be used to address the challenges identified in this study.

The findings in this survey provide a justification for intensifying peer-oriented programmes for mothers in the fight against diarrhoea. Volunteers' mothers/caregivers should be recruited trained and spread across all the barrack. Their training should include skills required for assertive and negotiation for preparation of ORT. Also more educational material like posters and billboard messages should be pasted at strategic places in the barrack to serve as a reminder each time they read it.

It was noted that as much as most respondents want to protect their children against contacting the disease, most children still experience episodes of diarrhoeal. It is needful then to train peer educators and concerned authorities in the barrack in the fight against the disease by teaching them hygienic sanitation and how to prepare ORT.

5.7: Conclusion

In conclusion, the findings of this study show that a good hygienic environment is helpful in preventing diarrhoeal disease among under-five children. This help to reduce infant mortality and morbidity. Children are mostly taken to health centre for prompt treatment. ORS/Salt sugar solution is often use by mothers for home management of diarrhoea, not every mother knows how to prepare salt sugar solution.

More than half of the respondents believed that teething caused diarrhoea, followed by dirty environment and the type of diarrhoea known by most of the respondents is watery diarrhoea. Less than half of the respondents took the diarrhoea disease to be very serious. More than half of the respondent uses ORS/salt sugar solution for home management treatment.

5.8: Recommendations

Based on the findings from the study, the following recommendations are hereby made;

1. Since health personnel were implicated as source of information, it is necessary to provide in-service training on the benefits of ORS/SSS and to ensure that the basic curriculum of front line health staff gives full emphasis to both the value of ORS/SSS and the process by which health workers can promote its usage. Health personnel themselves, either in their roles as mothers or fathers, upon giving ORS/SSS to their children could serve as role models to others in the community.

2. There is need to have diarrhoea information communication, education materials at each block of residence to increase the awareness and also to serve as a reminder for both mothers and caregivers. Media for diarrhoea information that aimed at male audience should include those that will have long lasting impact, like drama, posters and hand bills.
3. Environment should always be clean to avoid the spread of the disease. An environment cleaning committee should be inaugurated in the barrack.

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QUESTIONNAIRE

ASSESSMENT OF KNOWLEDGE OF CAUSES AND CAPACITY TO MANAGE DIARRHOEA USING ORAL REHYDRATION THERAPY AMONG MOTHERS OF UNDER-FIVE IN ODOGBO MILITARY BARRACK

Serial Number_____

Dear Respondent,

I am Agbolade M.O., a postgraduate student in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. I am carrying out a research that seeks to assess the knowledge of mothers of under-five on diarrhea and the management practices using oral rehydration therapy. I will be grateful if you kindly volunteer and answer every question honestly. Please be assured that all your responses will not be known to anyone and your name will not be written on this questionnaire. The information obtained from you will be used in designing better strategies for intervention measures later on in the nearest future.

Would you want to participate in the study? 1. Yes ( ) 2. No ( )

Thanks you.

Name of Interviewer_____
Date_____
Time the interview started_____ **Time ended** _____

SECTION A: SOCIO -DEMOGRAPHIC INFORMATION

1. Age_____

2. Occupation 1. Trading 2. Artisan 3. Teaching 4. Civil Service
   5. Farming 6. Housewife 7 Others (Specify)_____

3. What is your religion?1. Christianity 2. Islam 3. Traditional4.Others _____

4. Educational level 1. None 2. Primary 3. Secondary 4. Tertiary

5. What is your marital status? 1. Single 2. Married 3. Divorced
   4. Others (specify)

6. Ethnicity 1. Yoruba 2. Hausa 3. Igbo 4. Other specify_____

7 How many children do you have? _____

SECTION B: KNOWLEDGE ABOUT DIARRHOEA DISEASES

8. Have you ever heard about diarrhoea disease 1. Yes 2.No

9 If Yes to Question 8, from where did you get the information about the disease?

_____

10. From the list of types of diarrhea, please tick the **incorrec**t answer? 1. Acute watery diarrhoea 2 Bloody diarrhoea 3 Persistent diarrhea 4 Gonorrhoea

11. Give two causes of diarrhoea diseases? _____

12. From the list of symptoms of diarrhea, please tick the **incorrect** answer? 1. Stooling 2. Weakness 3. Loss of appetite 4. High Temperature 5. Noise in the stomach 6. Cough

13. At what stage is the child most likely to develop diarrhea? 1. Teething 2. Walking 3. Schooling Age 4. Sitting

14 How serious is diarrheoa disease? 1Serious 2Very Serious 3 Not Serious

SECTION C PREVENTION OF DIARRHOEA

The following measures can be taken to prevent diarrhea.

Tick (✓) the appropriate answer.

15.	Washing of hands without soap while preparing food for the child	True	. False	Don'tknow
16.	Using plate which has been used by other person without washing can prevent diarhoea			
17.	Mother should always change her cloth on daily basis to avoid diarrhoea			
18.	Ensuring that the water is clean before giving the child			
19.	Exclusive breast feeding of the child prevent diarrhoea			
20.	Cooking child's food where uncover refuse is close			
21.	Early treatment of the child can help prevent diarrhoea complication			
22.	Eating of sand while crawling			
23.	Disposal of faeces including those of infants around the House			
24.	Using unclean infant feeding bottles			

SECTION C: KNOWLEDGE ABOUT ORAL REHYDRATION SOLUTION(ORS)

Tick (✓) the appropriate answer from the following

25. Have you ever heard about ORS? 1. Yes 2. No

26 Where did you get the information about ORS?

27. Oral Rehydration Solution is used for the management of diarrhea. 1. True 2. False 3. Don't know

28 What are the contents of the ORS solution? 1. Salt, sugar and oil 2. Salt, sugar and water 3. Palmwine, sugar and salt 4. Don't Know

29. What is the ratio of sugar to salt? 1. 10:1 2. 4:2 3. 8:5 4. 6:3

30. What is the quantity of water? 1. One Fanta bottle 2. One beer bottle 3. One glass cup 4. One bowl of water

31 From the list,**Tick** 3 other things that can be used as ORS 1. Gari Water 2. Raw fufu 3 Rice water 4 Coconut water 5 Juice

32**.** Which of the following options is best used to give ORS to a child who has diarrhea? 1 Feeding bottle 2 Cup and Spoon 3 Don't know

33 When should you throw away unused prepared solution of ORS _____

34 ORS should be given with other food /breast milk 1. Yes 2. No

SECTION E: HOME MANAGEMENT OF DIARRHOEA

35 Has any of your children ever had diarrhoea? 1. Yes 2. No (If No skip to Question 42)

36. If Yes to Question 35, What type of diarrhoea did your child had then? 1. Dysentery 2. Watery stool 3. Teething stool 4. Bloody stool 5. Others (Specify)_____

37. What kind of home treatment did you give your child? 1. Gari water 2. Native Medicine 3. ORS /Salt sugar solution 4.Orthodox medicine 5. Other (Specify_____

38 Have you ever prepared ORS for any of your children/someone? 1 Yes 2 No

39 If Yes to Q 37, When last did you do so? _____

a)0-11 months (b)12-23 months (c)24-36 months

40. Did you take the child outside the home for treatment? 1. Yes 2. No

41. If Yes to Q39 Where was the child taken to? 1 Private Hospital 2. Health Center 3.Traditional Healers 4. Chemist 5. Others (specify)

42. In case, you have a child with diarrhea, how will you manage it? 1. Taking the Child to the Hospital 2. Giving ORS 3. Giving traditional medicine 4. Giving self medication at home

43 . Why did you choose the option?_____

44 What is your suggestion for preventing diarrheoa among children of 0-5 years?