

THE RELATIONSHIP BETWEEN RECURRENT
DIARRHOEA AND MALNUTRITION IN
CHILDREN AT THE WEANING STAGE

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<u>TABLE OF CONTENTS</u>	PAGE
LIST OF TABLES	(1)
DECLARATION	(11)
STATEMENT	(111)
DEDICATION	(iv)
ABSTRACT	(v)
ACKNOWLEDGEMENTS	(vi)
CHAPTER 1: <u>INTRODUCTION AND OPERATIONAL DEFINITIONS</u>	
1. INTRODUCTION	1
2. OPERATIONAL DEFINITIONS	4
CHAPTER 2: <u>LITERATURE REVIEW</u>	6
CHAPTER 3: <u>STATEMENT OF THE PROBLEM</u>	15
CHAPTER 4: <u>METHODOLOGY</u>	19
1. RESEARCH DESIGN	19
2. RESEARCH SETTING	20
3. SAMPLE, SELECTION AND APPROACH	21
4. PILOT STUDY	24
5. INSTRUMENT USED TO COLLECT DATA	24
6. QUESTION SEQUENCE	26
7. DATA COLLECTION	28
CHAPTER 5: <u>DATA ANALYSIS AND PRESENTATION OF FINDINGS</u>	29
CHAPTER 6: <u>DISCUSSION OF FINDINGS, NURSING IMPLICATIONS, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY</u>	41
1. DISCUSSION OF FINDINGS	41
2. NURSING IMPLICATIONS	57
3. CONCLUSIONS	59
4. RECOMMENDATIONS	59
5. LIMITATIONS OF THE STUDY	60

APPENDICES

BIBLIOGRAPHY

LIST OF TABLES

- TABLE 1: AGE DISTRIBUTION OF RESPONDENTS
- TABLE 2: EDUCATIONAL ATTAINMENT OF RESPONDENTS
- TABLE 3: RESPONDENTS' OCCUPATIONS
- TABLE 4: RESPONDENTS' LENGTH OF ABSENCE FROM HOME
- TABLE 5: RESPONDENTS' RESIDENTIAL AREAS
- TABLE 6: NUMBER OF CHILDREN IN RESPONDENTS' FAMILIES
- TABLE 7: AGE DISTRIBUTION OF RESPONDENTS' HOSPITALIZED CHILDREN
- TABLE 8: AGE AT WHICH RESPONDENTS' CHILDREN WERE WEANED
- TABLE 9: TYPES OF SEMI-SOLID FOODS WHICH RESPONDENTS GIVE TO THEIR CHILDREN
- TABLE 10: TYPES OF FOODS RESPONDENTS ADD TO THEIR CHILDREN'S PORRIDGE
- TABLE 11: FEEDING UTENSILS USED BY RESPONDENTS
- TABLE 12: RESPONDENTS' ABILITY TO PREPARE THEIR CHILDREN'S FOOD
- TABLE 13: COOKING PRACTICES AMONG RESPONDENTS' FAMILIES
- TABLE 14: PLACES WHERE RESPONDENTS STORE COOKED AND UNCOOKED FOOD
- TABLE 15: NUMBER OF TIMES RESPONDENTS FEED THEIR CHILDREN PER DAY
- TABLE 16: WHAT SUBJECTS DO WITH FOOD LEFT OVER BY THEIR CHILDREN
- TABLE 17: PERSONS WHO LOOK AFTER THE CHILDREN WHEN RESPONDENTS ARE AWAY FROM HOME
- TABLE 18: AGE DISTRIBUTION OF PERSONS WHO PREPARE FOOD FOR RESPONDENTS' CHILDREN
- TABLE 19: EDUCATIONAL ATTAINMENT OF PERSONS WHO PREPARE FOOD FOR RESPONDENTS' CHILDREN
- TABLE 20: NUMBER OF DIARRHOEAL ATTACKS RESPONDENTS' CHILDREN HAVE HAD IN THE LAST TWELVE (12) MONTHS

DECLARATION

I hereby declare that the work presented in this study has not been presented for any other degree and is not currently being submitted for any other degree.

SIGNED: *W. Kasapo*

CANDIDATE

APPROVED BY: *[Signature]*

SUPERVISING LECTURER

STATEMENT

I hereby certify that the work presented in this study is a result of my own independent work. I have acknowledged the various sources to which I am indebted in the text and in the bibliography.

SIGNED: *W. Casap*

CANDIDATE

(iv)

DEDICATION

I have dedicated this study to my mother Mrs. M. B. Kasapo
and my nephew Mutemba Mwamba.

ABSTRACT

The study was undertaken in Lusaka in the Paediatric Unit of the University Teaching Hospital in March 1986. The study sought to establish the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage. Fifty (50) mothers of children admitted to hospital with diarrhoea and malnutrition and with a history of repeated diarrhoeal episodes were included in the sample.

The literature was based on the feeding practices and the living conditions that may affect the mothers' feeding practices which may lead to weanlings suffering from repeated attacks of diarrhoea and subsequent malnutrition. The literature revealed that recurrent diarrhoea and malnutrition mainly affected less developed countries. Socio-economic factors such as low educational level, low wages and salaries, overcrowding in shanty compounds and homes and poor environmental sanitation were identified as the main contributory factors to the high incidence of diarrhoea and subsequent malnutrition.

An interview schedule was used for collecting data from the subjects. Data were collected personally during the week and at the week-end in the wards; and were analysed manually and tabulated. The findings reveal that subjects were of a low socio-economic status with limited education. The results also show that the respondents lacked the knowledge on when, how and how often and what type of food to give to the weanlings. Furthermore they did not know what caused diarrhoea, consequently, they did not know what measures to take to prevent the disease. Their inability to practice what they were taught due to financial constraints and educational limitations was identified as a contributory

factor to the repeated attacks of diarrhoea and subsequent malnutrition among weanlings.

In conclusion, although the subjects were keen to learn how to prevent recurrent diarrhoea and consequential malnutrition, they are hampered by a number of factors. These include poverty and deprivation, inadequate support in the subjects' homes from public health nurses and other nurses. More public health nurses should be trained. Preventive health education should be intensified through regular home visiting so that more mothers could be educated to take simple home measures to prevent recurrent diarrhoea and subsequent malnutrition and lower morbidity and mortality among weanlings.

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CHAPTER 1

INTRODUCTION AND DEFINITIONS OF TERMS

1. INTRODUCTION

Recurrent diarrhoea and malnutrition in children at the weaning stage is a serious public health problem and a major cause of morbidity and mortality (Rowland, 1981). The disease occurs often in children between the age of six (6) months and two (2) years (Blecker, 1983). This is because at the age of weaning the infant has lost the passive immunity transmitted from the mother. And as he begins to move about he is exposed to the environment and eats contaminated food and suffers repeated attacks of diarrhoea with subsequent malnutrition.

Malnutrition associated with recurrent diarrhoea manifests itself after three (3) or four (4) episodes. Each episode, if acute, requires hospitalization. Repeated admissions to hospital of weanlings suffering from frequent diarrhoea and consequent malnutrition places a tremendous economic burden on the health services.

There are two types of recurrent diarrhoea occurring at the weaning stage, namely, recurrent dietary diarrhoea and infectious recurrent diarrhoea. Recurrent dietary diarrhoea is usually caused by giving incorrectly prepared food to the child. Recurrent dietary diarrhoea consequently leads to malnutrition because the child does not get the nutrients he needs since the food is not properly digested.

Recurrent infectious diarrhoea is caused by viruses or bacteria. This is the more common of the two types. The manifestations of recurrent diarrhoea and subsequent malnutrition include growth faltering or retarded growth due to reduced food intake (Tomkin, 1985), reduced strength and, in severe cases, possible intellectual impairment (Yohani, 1981). The child is likely to fail to reach his true intellectual potential, thus he may not be able to make his full contribution to the development of the country.

The causative factor in weanling diarrhoea and subsequent malnutrition is contamination of food and drink (Diarrhoea Dialogue, 1980). In low socio-economic communities where environmental sanitation is very poor, the food frequently becomes contaminated especially in the rain season when recurrent diarrhoea and consequent malnutrition is at a peak. Recurrent diarrhoea and subsequent malnutrition is associated with poverty and with environmental and educational conditions that accompany ^apoverty (Feachem, 1981). Linked to women's deficient education is their lack of sufficient knowledge of what, when and how to wean their children particularly among the urban poor. Some mothers may wean very early others very late but both carry the risk of repeated attacks of diarrhoea with subsequent malnutrition (Hofvander, 1981). Unfortunately the conveniently bulk gruel given to children as a weaning food is nutritionally poor and can be easily contaminated.

Lack of knowledge by the mother coupled with the rising cost of food stuffs and other essential commodities makes it difficult for the mother to prepare a balanced diet for the child. Recurrent diarrhoea and resultant malnutrition impair the body defence mechanism, thus exposing the child to more severe and longer lasting episodes of diarrhoea and subsequent malnutrition.

Inability to follow instructions on the tins contributes to the mothers' giving incorrectly diluted milk formulae to weanlings. This may lead to recurrent dietary diarrhoea with subsequent malnutrition. It is generally feasible to prepare weaning food with proper combinations of local foods consumed by older children and adults (Kepakepa, 1981), although it requires considerable knowledge to select the right ingredients and the right amounts. Mothers should be advised by public health nurses and other nurses to use locally available and affordable weaning foods to reduce the high incidence of diarrhoea and subsequent malnutrition.

Spoilage of food occurs often in poor communities due to lack of storage facilities and lack of knowledge on how to store the food. Weaning foods have to be stored in a manner that will keep them away from contamination (Kombe, 1981). Non availability of electricity and fridges in the homes makes it difficult for mothers to store food at cold temperatures thus exposing it to heat which encourages multiplication of micro-organisms. Such food, if given to weanlings would cause recurrent diarrhoea and consequently malnutrition. Mothers should be advised by the health workers to prepare food which can be eaten in one meal and to re-heat the food thoroughly before it is given to children in order to reduce the high incidence of diarrhoea and subsequent malnutrition.

Recurrent diarrhoea and subsequent malnutrition is common during the weaning period because of lack of clean and wholesome water, poor sanitation and general standards of personal and domestic hygiene. This coupled with financial limitation makes it difficult for the mother to practice what she is taught. But the disease can be reduced in the short term by improving the water supply, provision and effective use of affordable and appropriate latrines and hygiene.

This requires concerted effort of those concerned with educating mothers how to prevent recurrent diarrhoea and consequent malnutrition. Preventive health education, regular home visiting and follow up home visiting during which individual teaching can be done are essential if recurrent diarrhoea with subsequent malnutrition is to be reduced. Integrated approach involving various sectors of the community will help to reduce the high incidence of diarrhoea and subsequent malnutrition, and thus, lower infant and child mortality due to this disease. The community should take advantage of the International Drinking Water Supply and Sanitation Decade and improve the water supplies and sanitation for the health of the children.

2. OPERATIONAL DEFINITIONS

For the purpose of this study, the following terms are used as follows:

FOOD HYGIENE:

All measures necessary for ensuring the safety of food at all stages from growth, production until its final consumption.

HIGH DENSITY AREA:

Refers to an area where a large number of persons reside and in which houses are constructed close to one another as compared to an area of similar size elsewhere.

LOW DENSITY AREA:

An area where a small number of persons reside and houses are adequately spaced as compared to another area of similar size that has more people and more houses.

NURSE:

Any person that has undergone a two (2) or three (3) year training programme and is licensed to practice.

WEANING:

Process by which an infant gradually becomes accustomed to full adult diet.

WEANLING:

A young individual aged between four (4) months and two and half (2½) years who is in the weaning process.

WEANING FOOD

All substances whether in natural stage or a prepared form which is part of the weaning diet.

CHAPTER 2

LITERATURE REVIEW

In Zambia very little research has been done to determine the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage. Recurrent diarrhoea and malnutrition in this age group is a major public health problem in most, if not all developing countries.

The Government of Zambia is particularly concerned about this serious health problem which has caused many deaths in children. The prevention of recurrent diarrhoea which leads to malnutrition in children during the weaning period has, therefore, become one of the national health priorities as demonstrated by the implementation of the Control of Diarrhoeal Diseases Programme (CDDP) which is an important programme in Zambia (UNICEF/WHO/Ministry of Health Report, 1984 p. 45). Jarrett (1983) states that recurrent diarrhoea with subsequent malnutrition is a common and well recognized hazard of the weaning period as indicated by the phrase "weanling diarrhoea".

A child who gets several episodes of diarrhoea during the weaning period is susceptible to malnutrition. The negative effects may show sooner or later; his growth and development may be affected. Yohani (1981) states that even if the child survives it may be with stunted growth, reduced strength and possible intellectual impairment. Such a child may emerge as an adult with minor or severe disabilities. He may not grow to his fullest potential as an adult, thus, may not be able to contribute to the development of the country.

There are two types of recurrent diarrhoea occurring during the weaning period, namely, dietary and infectious. Recurrent dietary diarrhoea may be due to irritation of the gut by new and unaccustomed foods. The food may be unsuitable, indigestible or ill cooked. For example, King et al (1982) state that certain foods such as whole cooked beans and groundnuts which are not well pounded cause diarrhoea. The above statement does not apply to the method of preparing beans and groundnuts for weanlings in Zambia where cooked beans is well mashed and groundnuts are finely pounded before adding to the porridge. If mothers do not mash the mixtures well, the children may get recurrent diarrhoea and subsequent malnutrition. Duharriel (1985) adds that milk formulae prepared with too much sugar will cause recurrent diarrhoea and consequently malnutrition.

However, observation and experience have shown that infectious diarrhoea is more common than dietary diarrhoea because of the many factors involved. These include, lack of knowledge by mothers or other care agents on when to start weaning, how to wean the child and how often to feed the child coupled with lack of knowledge on good hygiene habits. Although it is generally accepted that weaning should start at four (4) or six (6) months, individual mothers may start earlier than four (4) months and later than six (6) months depending on the amount of breast milk being produced. How and how often the mother feeds her weanling may depend on her knowledge and intelligence to choose the right food and on the availability of water, food and local fuel to enable her to prepare frequent meals.

Furthermore, early weaning seems to be more common than late weaning among women. Wirfelt et al (1982) in their study on infant and young children feeding in Zambia reveal that weaning can start as early as two and half (2½) months if the baby is crying too much. Cameron and Hofvander (1983) observe that in some cultures breast feeding is stopped when the mother has become pregnant again. The same applies in many cultures in Zambia, especially in areas where diarrhoea or even serious conditions such as kwashiorkor may be associated with breast feeding while the mother is pregnant. The problem is compounded with the frequent pregnancies among most women in the child bearing age.

Although Diarrhoea Dialogue (1984) reports that babies are protected at birth from severe rotavirus diarrhoea by antibodies received from their mothers, Pradilla (1984) argues that though partially protected from diarrhoea by breast milk, the child is exposed to environmental hazards which multiply as environmental hygiene gets poor. The weanlings who are weaned at a very early age and whose foods are prepared under unhygienic conditions may have several episodes of diarrhoea with subsequent malnutrition which may lower their resistance to further attacks of diarrhoea. Pyke (1977) states that the weanlings' passive immunity diminishes due to new foods containing large numbers of pathogens being introduced into the gut for which it is not prepared. "Some mothers particularly those in the low income group wean early due to insufficient milk production which is associated with poverty" (Kakitani, 1981 p. 27). If the mothers give their very young children artificial milk which is contaminated, the weanlings will have bouts of diarrhoea which may cause malnutrition in the long run.

Grant (1986) states that with weaning on contaminated food and loss of passive immunity, the incidence of diarrhoea becomes high, between seven (7) to eight (8) episodes per year. A vicious circle sets in. Diarrhoea Dialogue (1980) reports that recurrent diarrhoea coupled with inadequate feeding results in impaired body defence mechanism. King et al (1982) and Cooper (1985) observe that recurrent diarrhoea helps to cause or aggravate malnutrition and malnutrition assists to cause diarrhoea. The reason being that recurrent diarrhoea reduces the food consumption through anorexia and impairs absorption and utilization of nutrients because the food goes through the gut too quickly so that the child does not have time to absorb it. Recurrent diarrhoea causes malnutrition due to increased catabolic losses. If weanlings are given contaminated food and if their diet lacks protein and energy foods, they may continue having episodes of diarrhoea with subsequent malnutrition.

Cameron and Hofvander (1983) state that young children need more than one meal per day to complement the breast milk they are given. In poor communities, especially in the shanty compounds, mothers may not be able to cook frequent meals for small children due to the shortage of local fuel such as paraffin and/or charcoal. Instead, large quantities of food are prepared and kept for long periods when they may easily become contaminated if storage facilities for pre-cooked meals are hazardous as may be the case in homes without refrigerators. The mothers may not understand that weaning foods, like most other foods, have to be preserved and stored in a manner that will keep flies, insects, rats and dogs away from them to avoid contamination.

Only freshly cooked foods should be given to children. Fruits should be peeled or washed before giving them to weanlings. Weanlings who are given contaminated foods may get episodes of diarrhoea and consequently malnutrition. Left over foods should be thoroughly re-heated before giving them to the children in order to prevent recurrent diarrhoea with subsequent malnutrition.

The urban elite may know and afford the supplementary formulae. The problem arises when they employ young and inexperienced nannies of whom the majority may be school drop outs. These young girls may lack knowledge on how to prepare and feed the weanlings under hygienic conditions. Gretel et al (1984) state that when the care of infants at weaning stage is delegated to child nurses, indications are that the quantity and quality of food given to infants may suffer. Munyashongera (1981) adds that these girls in general have little knowledge of hygiene which introduces the risk of recurrent gastro-enteritis and consequently malnutrition.

Freeman (1970) and King et al (1982) observe that some nannies may be indifferent and insensitive to the needs of the children and may feed them with contaminated food even if everything required was left prepared by the mother in case of working mothers. Even if the environment was hygienic, the young nannies may lack knowledge of simple home measures to prevent contamination of drink and food measures such as washing of hands before and after using the toilet or after changing the baby's napkins or washing their hands before feeding the child, including thorough washing and sterilizing of utensils, feeding bottles and teats. The problem is compounded by their limited education. Furthermore, these nannies may not be able to follow instructions on the tins of artificial foods because they are written in English.

They may end up giving the children either over-diluted or under-diluted foods which may cause recurrent dietary diarrhoea with subsequent malnutrition. Children's foods are also prone to contamination because the home helpers may leave the feeding bottles containing the feed outside the fridges, thus exposing them to warm temperatures which cause milk to go off. Weanlings who are looked after by young nannies may have recurrent diarrhoea with subsequent malnutrition due to the reasons given above. Kakitani (1981 p. 28) adds:-

The poor urban mothers who are employed casually or other form of low paid labour are not legally protected to have maternity leave and usually forced, for economic reasons, to resume work shortly after delivery. They usually start feeding their children on milk using a bottle, or any gruel the child's attendant prepares.

Although the statement refers to the Ugandan urban poor, it is also applicable to the women in the poor social class in Zambia who, due to the prevailing economic situation, are in low paid employment usually as house servants. They leave their children in the care of their older siblings who may lack knowledge on proper ways of looking after a child. The results may be similar to those children looked after by young nannies above. The children looked after by their older siblings get recurrent diarrhoea with subsequent malnutrition as well.

Chanesta (1981) observes that mothers in the peri-urban areas tend to copy women in the high income group and start artificial feeding, frequently with over-diluted milk formulae using a bottle. Experience and observation have shown that they often buy the plastic feeding bottles because of the rising cost of glass.

The use of the plastic bottle coupled with ^{poor} environmental surroundings render the preparation of bottle feeds under hygienic conditions impossible. The children brought up on artificial feeds are vulnerable to recurrent diarrhoea with subsequent malnutrition.

Kombe (1981) states that low standards of sanitation and purchasing power of most families mean artificial feeding cannot be conducted satisfactorily and therefore, gastro-enteritis attacks infants who consequently develop malnutrition. Hofvander (1981) adds that in the common unhygienic environment, any additional food whether solid or milk mixtures particularly if given by bottle, carries the risk of recurrent diarrhoea with subsequent malnutrition. Gurney (1983) supports Hofvander by saying that in poor unsanitary environment, it is difficult to avoid recurrent diarrhoea with subsequent malnutrition. The above statements apply to the peri-urban areas in Zambia where environmental sanitation is still very poor. The weanlings have bouts of diarrhoea because of shortage of clean and wholesome water and local fuel, poor sanitation and general standards of hygiene.

Utensils, especially feeding bottles and rubber teats are not easy to keep clean. King et al (1982) observe that even if a child is carefully bottle-fed, he will get recurrent diarrhoea more often than a breast-fed baby. Balldin et al (1984) explain that the feeding bottle usually cannot be cleaned properly and sterilized thoroughly in unsanitary conditions, therefore,

bacteria and other micro-organisms may grow in milk and grow quickly in warm dirty feeding bottles. Even if it is little milk left in the bottle, micro-organisms will flourish in it. If children are given a feed of dirty milk with many micro-organisms in it, they may get recurrent diarrhoea. Infants who get bouts of diarrhoea from dirty feeding bottles will consequently have malnutrition.

In fact, long professional experience and observation have shown that it is the same children who are repeatedly admitted to the paediatric wards with recurrent diarrhoea and malnutrition. This may be because they return to the same unsanitary environment on discharge from hospital. Elliot (1982) states that the success in preventing recurrent diarrhoea and malnutrition lies in the close involvement of the mothers whose children are admitted to the hospital. They should help with the children's care and feeding and learn to continue good personal hygiene when they return to their homes. Unfortunately in the University Teaching Hospital, mothers are only allowed into the paediatric wards at three (3) hour intervals to go and feed their children with foods that they are not accustomed to like Irish potatoes and rice with minced meat. Lack of follow up home visits also contribute to the mothers not putting what they were taught into practice.

Furthermore, during fieldwork in the health centres, observation and experience showed that health education is not given by the health workers on this serious problem. The health workers on the curative side think that it is covered by nurses on the Maternal and Child Health side who also think, that those on the curative side should address the problem since they see and treat children with recurrent diarrhoea. As a result, mothers are not taught the causes and prevention of recurrent diarrhoea either at the health centres or in some paediatric wards in the hospitals. Lack of follow up home visits may be another contributory factor to the frequent episodes of diarrhoea and malnutrition in weanlings. Mothers continue preparing the weaning food and feeding their children under unhygienic conditions.

They lack the understanding of the association between recurrent diarrhoea and malnutrition because they are not given individual education in their homes. Frequent home visits would assist in the identification of infant feeding and child care practices that best reduce recurrent diarrhoea and malnutrition.

Well planned follow up visits would also enable the health workers to check on the environmental situation. The careful and consistent information and advice, and good support given during individual education sessions in the home would be effective in changing the mother's unhygienic habits to acceptable standards of hygiene which in the long term will reduce the incidence of recurrent diarrhoea among children with consequential malnutrition.

CHAPTER 3

STATEMENT OF THE PROBLEM

Diarrhoea and malnutrition are intimately connected because each worsens the other and together they cause many deaths in children at the weaning stage each year. Observation and experience have shown that most Zambian women tend to wean their children at an early age due to repeated pregnancies, thus making them vulnerable to diarrhoea and malnutrition. This is coupled with abrupt and unplanned weaning practices practised by many women. Abrupt weaning can be very painful to the child and can lead him to feel he is being deprived of maternal love and care. It can also be very harmful because the child is forced to change to adult food which causes irritation of the gut, therefore the food will not be properly digested and absorbed. This will lead to repeated diarrhoea and consequently malnutrition. Hofvander (1981) states that early weaning may cause diarrhoea which may lead to malnutrition. Diarrhoea Dialogue (1983) reports that the introduction of supplementary foods too early in unsanitary conditions contributes to high incidence of diarrhoea and subsequently malnutrition.

There are two types of recurrent diarrhoea occurring at the weaning stage, namely dietary and infectious diarrhoea. Dietary diarrhoea is usually caused by giving under-diluted or over-diluted milk and milk products, indigestible foods or ill-cooked foods. Recurrent dietary diarrhoea consequently leads to malnutrition because the child does not get the nutrients he needs since the food is not properly digested.

Infectious diarrhoea, on the other hand, is caused by viruses (rotavirus) or bacteria particularly E.Coli (Candy, 1981).

Although most babies are protected at birth from severe rotavirus disease by antibodies received from their mothers (Bishop, 1984), constant exposure to diarrhoea causing pathogens in the unhygienic conditions under which they are reared lower their resistance to diarrhoea. They, therefore, suffer repeated episodes of diarrhoea which eventually lead to malnutrition.

Rowland (1981) states that contaminated food is one of the most critical problems during the weaning period. In poor hygienic and sanitary environment, it is very difficult to avoid diarrhoea in young children. The weanling is becoming accustomed not only to the new food but to a new environment and to new physical and mental skills as well. He moves about and eats food left lying around on the ground. He easily and quickly becomes infected with rotavirus or E.Coli and gets recurrent diarrhoea. He consequently develops malnutrition. Sanitary environment is an important factor in preventing recurrent diarrhoea and subsequent malnutrition.

Grant (1986) states that in very poor communities, a weanling may get diarrhoea six (6) or more times per year. The consequential malnutrition may not be insidious but manifests itself after four (4) or more episodes of diarrhoea with each bout lasting for several days. In fact, experience has shown that most of the children who are repeatedly admitted to hospital with diarrhoea eventually develop malnutrition. Maletnlema (1981) adds that some children who get recurrent diarrhoea during the weaning period develop either mild or severe malnutrition.

Long professional experience has shown that weanlings who suffer several bouts of diarrhoea with subsequent severe malnutrition tend to develop kwashiorkor with its negative effects on growth and possible impairment of intellectual capabilities. Yohani (1981) adds that a child who survives several episodes of diarrhoea and subsequent severe malnutrition may have stunted growth and in very severe cases possible intellectual impairment. The child, therefore, may fail to perform with his fullest intellectual capabilities for the development of the country when he grows into an adult.

In conclusion, recurrent diarrhoea and subsequent malnutrition in children at the weaning stage may be attributed to lack of knowledge, poverty, and unfavourable economic and social factors.

The study attempts to show the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage who are admitted to the University Teaching Hospital (U.T.H.). It is hoped that the findings will help in devising effective ways and means of educating the mothers, and consequently, the communities on how to prevent recurrent diarrhoea and subsequent malnutrition at this crucial stage in a child's life. The study will attempt to answer the research question: "Is there a relationship between recurrent diarrhoea and malnutrition in children at the weaning stage?"

The hypotheses for the study are:-

1. Mothers' lack of knowledge on types and preparation of weaning foods contribute to recurrent diarrhoea and consequently malnutrition in weanlings.
2. Weanlings who are looked after by young and inexperienced nannies or siblings suffer from recurrent diarrhoea and subsequent malnutrition more than those who are cared for by their mothers.

3. Children from good sanitary environments get recurrent diarrhoea and consequent malnutrition less frequently than those living in poor sanitary environment.
4. Children who have had more than four (4) episodes of diarrhoea show signs of malnutrition.

CHAPTER 4

METHODOLOGY

1. RESEARCH DESIGN

A descriptive research design was thought to be the most appropriate in determining the relationship between recurrent diarrhoea and malnutrition. The reasons for the choice of this design are firstly, the nature of the data required for the study was to be in a descriptive form in order to establish the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage. Polit and Hungler (1983) state that a descriptive survey aims at providing the characteristics of the persons, situations and the frequency with which they occur.

Secondly, the gathering of data is done in a natural setting as opposed to the experimental research design, the subjects, therefore, co-operate more easily. The respondents were free to give their own views because they were not under the control of the investigator. They co-operated with the interviewer because they were required to give retrospective information that would be recalled in a short time.

Thirdly, the descriptive research design allowed for data to be collected from already existing resources thus, allowing for more subjects to be covered and making the findings more representative. Lastly, the descriptive research design is cheaper and it allows for the completion of the study in a short time (Abdellah and Levine, 1979).

2. RESEARCH SETTING

The study was undertaken in the Paediatric Unit of University Teaching Hospital which is the largest hospital in Zambia with a bed capacity of one thousand five hundred (1500). It has several departments namely, medical, surgical, obstetrics and gynaecology, maternity, paediatrics, surgical paediatrics, casualty and out-patient. It provides curative, preventive and rehabilitative services. It also provides training and research facilities for doctors, nurses, physiotherapists, radiographers and laboratory technicians. The hospital is governed by the University Teaching Hospital Board of Management with the Executive Director as the Chief Executive of the institution. The nursing staff fall under the Principal Nursing Officer.

The study was undertaken in the Paediatric Unit which admits children up to the age of twelve (12) who have medical conditions. The unit has a capacity of two hundred and thirty (230) beds and cots with an average turn-over of three hundred (300) patients per day. The children share cots because of the high patient turn-over. The Unit has four (4) wards namely, A02, A04, A05 (isolation) and A06 (rehydration). It has a small special treatment room for patients requiring intensive care. The Unit has its own Out-patient and X-Ray departments and pharmacy. The Unit Nursing Officer supervises three (3) sisters, three (3) public health nurses, one (1) medical social worker, nine (9) nutrition demonstrators, one (1) family health nurse and eighty-one (81) cleaners and general workers.

Wards A02, A04 and A06 were used for the selection of subjects because the first two (2) have rooms specifically for children with protein energy malnutrition (PEM), the majority of whom had diarrhoea and severe malnutrition while the third ward is used for rehydrating children with diarrhoea and dehydration. There are four (4) sisters and forty-five (45) nurses between the three (3) wards providing a twenty-four (24) hour service. Ward A04 has the largest number-fourteen (14) nurses followed by Ward A02 with eleven (11) nurses and Ward A06 with only five (5) nurses because it has fewer cots. In addition, there are twelve (12) nutrition demonstrators between four (4) wards covering night and day shifts as well. The number of nurses and nutrition demonstrators appear large in theory but in practice, they are very inadequate because at any one given time, some nurses are on nights off, others are day off, some are on maternity leave, sick leave while others may be on emergency leaves. There are fewer nurses on night duty than in the morning and afternoon shifts. The number of public health nurses, nurses and nutrition demonstrators is most inadequate in view of the congestion on the wards and the calibre of mothers who need repeated explanations and close supervision, particularly during feeding which is done at three (3) hour intervals at night as well. A lot of mothers desperately need individual attention that is teaching and counselling.

3. SAMPLE, SELECTION AND APPROACH

The target population were mothers whose children were admitted with diarrhoea and malnutrition. The target population was thus selected because mothers were seen as the right persons to know the frequency of diarrhoeal episodes of the children and, therefore, able to give information in retrospect.

The subjects who participated in the study had children who were diagnosed as having diarrhoea and malnutrition and a history of recurrent diarrhoea. They had taken their children to the health centre with recurrent diarrhoea for treatment in the last twelve (12) months. This is because often subjects come to hospital only if their children's diarrhoea worsens, or if it does not stop, or if they have been referred there for further investigations and treatment. The subjects whose children were admitted on the day of the interview were also included in the study. It would have been better to include only subjects whose children had been in hospital for a few days but this was found impossible due to the high patient turnover which could have lead to a high number of casualties. The maximum age set for respondents' children was thirty (30) months because some mothers wean late and continue to breast feed after two years. W. H. O. (1985) reports that diarrhoea is most common in children, especially those between six (6) months and two (2) years of age.

Permission to interview mothers was sought by writing to the Nursing Officer of the Paediatric Unit (Appendix 1). Permission was first granted verbally followed by written authority (Appendix 2). The subjects were approached individually, self introduction was done and the purpose of the study explained as simply and as clearly as possible in the language they could understand. Most of the mothers were willing to participate. Some looked at their participation as a learning experience. Even mothers who did not meet the criteria were asking if they could be allowed to participate as well.

It was decided to have a sample of fifty (50) mothers. Although Brick and Wood (1978) state that large samples maximize the possibility that the mean, percentages and other statistics are true estimates of the population, the size of the sample was influenced by practical considerations such as the availability of subjects and the limited time in which to complete and submit the study to the Department of Post-Basic Nursing. The other reason was financial constraint. A larger study would have involved more money. Although the sample was not large enough for generalization of the findings, it was felt that the number was large enough for the study of this size because the information to be collected was to have equal value.

The sample was selected by purposive sampling. Abdellah and Levine (1979 p.704) define purposive sampling as:-

A type of non-probability sampling in which units are deliberately (non-randomly) chosen according to criteria that are known to be important and are considered to be representative of the total or large number of the population.

Purposive sampling was used because the size was small. In addition, illiterate subjects were accorded an opportunity to participate in the study particularly that an interview schedule was used to collect data. These would have been excluded if a questionnaire method was used. The subjects who were to be included in the study were required to meet the following criteria:-

1. The subjects' children had a history of not less than three (3) episodes of diarrhoea in the last twelve (12) months.
2. The age of the respondents' children had to be not more than thirty (30) months.
3. The subjects were willing to give information freely.

False information might be given if subjects were not willing to participate in the study.

4. PILOT STUDY

A pilot study is a small scale study carried out before a large scale research project is conducted and it includes an analysis of the results (Sweeney and Olivieri, 1981). It is used to test the validity and realibility of the instrument to be used in the study for collecting data.

A pilot study was, however, not carried out due to the limited time in which the study had to be completed and submitted to the University authorities. The proposed items in the instrument used to collect data were, however, reviewed for clarity and reliability by the lecturer in nursing research.

5. INSTRUMENT USED TO COLLECT DATA

For the purpose of the study, a structured interview schedule (Appendix 3) was used to collect data because it allows for collection of fairly consistent data (Sweeney and Olivieri, 1981). An interview schedule is defined as a verbal discussion conducted by one person with another for the purpose of obtaining information (Mason and Bramble, 1978).

The sample was chosen from a population of mixed socio-economic status. Some of the participants were members of the lowest class who could not read or write. The interview schedule was, therefore, thought to be the most appropriate instrument since all members of the community have an equal chance of participating in the study. Similarly, questions that are not clear to the respondents can be rephrased. The interviewer can also get clarification from the participants. An interview schedule allows for selecting and obtaining only the required information (Mason and Bramble, 1978).

The investigator hoped that all relevant questions would be answered by using this tool. In addition the interview schedule has the following advantages:-

1. Flexibility - since the interviewer can explore responses and tailor the interview to the situation (Mason and Bramble, 1978. p. 299).
2. Certain responses can be explored in depth by probing and/or repeating subjects' answers (Treece and Treece, 1982. p.245).
3. Interviews enable the interviewer to judge the subjects' level of understanding, degree of cooperativeness, social status and non-verbal clues through observing.
4. Illiterate, elderly or physically handicapped clients whose contribution to the study could be equally important can be included in the study.
5. High response rate as the respondent may find it difficult to refuse to talk. Response rate is in range of 80 - 90 percent (Polit and Hungler, 1983. p. 320).

However, interviews have the following disadvantages:-

1. Interview schedule may be time consuming if a large number of respondents is involved in a one to one interview.
2. Person to person interaction might scare the interviewee from answering sensitive questions.
3. Biases, perceptions and opinions of the interviewer can influence the questions that are asked, the responses that are given and the way they are recorded (Mason and Bramble, 1978. p. 299).
4. Recording errors may occur as the interviewer tries to write answers in a hurry.
5. Some useful information may be missed if the interviewee loses her trend of thought while waiting for the investigator to finish writing.
6. The mood of the interviewer can change and affect answers especially if a large number of subjects is to be interviewed.
7. Interview schedules do not offer complete anonymity. The respondents may give incorrect answers (Craig and Metze, 1977. p. 221).

8. Some meaning of words may be altered by translating English words into the local language.

In order to minimize the above disadvantages, the purpose of the study was explained to individual subjects in order to gain their cooperation and to establish rapport so that subjects would feel free to express their views and opinions. The participants were also assured of anonymity and confidentiality by informing them that the interviewer would not ask for their names. In order to remove suspicion, the investigator informed the subjects that she would be taking notes in order not to forget what they have said. The assurances given and other measures taken helped in creating an atmosphere conducive for interviews thus, making the subjects feel at ease and relaxed.

5. QUESTION SEQUENCE

The interview schedule consisted of thirty-four (34) questions. The first seven (7) questions were designed to obtain demographic data on respondents such as educational attainment, occupation, residential area, number of children in the family. Question eight (8) sought the age of the admitted child.

Questions 10 to 11c and 17 to 19 were included to get information on the children's age when weaning commenced, the kind of food the children were given, how often such feeds were given and the reasons for the frequency of feeding.

In order to obtain information on the subjects' knowledge on the preparation of various foods and simple home measures to be taken to prevent contamination of food, questions 12, 13 and 14 were asked. Question 15 sought information on how mothers prepare children's food.

Information relating to storage of cooked and uncooked food was sought in questions 16, a, b and c. Questions 20 to 24 sought information on whether or not young girls or other persons looked after the children when subjects were away from home all day. Question 25 elicited data on the number of times subjects' children have suffered from diarrhoea. Information relating to participants' knowledge of the causes of recurrent diarrhoea was sought in questions 26 and 26a.

Questions 27 and 29 were designed to get information on the environmental sanitation in subjects' residential areas and their knowledge on minimizing health hazards. Questions 30 and 31 sought information on whether subjects since their children's admission had received any health education from public health nurses on recurrent diarrhoea and malnutrition. Information relating to subjects' education regarding recurrent diarrhoea and their ability to utilize the knowledge at home was sought in questions 32 and 33.

Information relating to follow up home visits by public health nurses and other nurses and activities which went on in the subjects' homes was sought in questions 34, a, b and c.

6. DATA COLLECTION

Data were collected in March, 1986. Interviews were conducted during the day when respondents were allowed into the wards to feed their children and in the evenings especially in Ward A02 when the Secretaries' office was free and also because there was less activity in terms of doctors' rounds. There were fewer disturbances in wards A04 and A06 where interviews were conducted in the Sister's office. However, there were disturbances in ward A02 where due to lack of office accommodation and criss-cross traffic, interviews were conducted in the corner in the verandah of the ward behind the cleaning staff's changing cabins. The interviewing time was changed to evening for the above reasons.

Privacy on Wards A04 and A06 was ensured by having interviews conducted in the Sister's office and on Ward A02 in the Secretaries' office which became free after they had knocked off.

Out of fifty (50) subjects, only three were interviewed in English. The rest were interviewed in local languages commonly used in Lusaka namely, Nyanja, Bemba and Lenje. Due to language difficulties the investigator was experiencing, a student nurse assisted by interpreting questions and answers from English to Nyanja and vice versa. This allowed for inclusion of mothers who would have been excluded from the study on the basis of language.

CHAPTER 5

DATA ANALYSIS AND PRESENTATION OF FINDINGS

1. DATA ANALYSIS

The purpose of the study was to establish the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage admitted to the University Teaching Hospital.

Polit and Hungler (1983) state that data collected are not useful unless they are arranged in a meaningful manner so that it is possible to derive patterns of relationships. The data collected for the study were analysed manually with the aid of a calculator. Responses were processed and categorized. Two (2) vertical bar and a slash tallying method was used. The data were arranged in frequency counts and percentages. Most of the findings are presented in tabular form with some information presented in written form.

2. FINDINGS

TABLE 1: AGE DISTRIBUTION OF RESPONDENTS

AGE RANGE	NUMBER OF RESPONDENTS	PERCENTAGE
18 - 22	20	40
23 - 27	15	30
28 - 32	7	14
33 - 37	3	6
Does not know	3	6
38 - 42	2	4
TOTAL	50	100

TABLE 2: EDUCATIONAL ATTAINMENT OF RESPONDENTS

EDUCATIONAL LEVEL	NUMBER OF RESPONDENTS	PERCENTAGE
Primary	31	62
None	10	20
Secondary	9	18
TOTAL	50	100

TABLE 3: RESPONDENTS' OCCUPATIONS

OCCUPATION	NUMBER OF RESPONDENTS	PERCENTAGE
House wife	27	54
Marketeer	9	18
Street Vender	4	8
Dependant	4	8
House Maid	3	6
Tailor	2	4
Peasant farmer	1	2
TOTAL	50	100

TABLE 4: RESPONDENTS' LENGTH OF ABSENCE FROM HOME

LENGTH OF ABSENCE	NUMBER OF RESPONDENTS	PERCENTAGE
Just briefly for errands	31	62
Part of the day	10	20
All day	9	18
TOTAL	50	100

TABLE 5: RESPONDENTS' RESIDENTIAL AREAS

RESIDENTIAL AREA	NUMBER OF RESPONDENTS	PERCENTAGE
High density	31	62
Medium density	11	22
Farm	3	6
Village	3	6
Low density	2	4
TOTAL	50	100

TABLE 6: NUMBER OF CHILDREN IN RESPONDENTS' FAMILIES

NUMBER OF CHILDREN	NUMBER OF RESPONDENTS	PERCENTAGE
1 - 2	25	50
3 - 4	15	30
5 - 6	6	12
7 - 8	3	6
9 and above	1	2
TOTAL	50	100

TABLE 7: AGE DISTRIBUTION OF RESPONDENTS'
HOSPITALIZED CHILDREN

AGE IN MONTHS	NUMBER OF RESPONDENTS	PERCENTAGE
18 - 22	16	32
13 - 17	15	30
8 - 12	13	26
23 - 27	6	12
TOTAL	50	100

TABLE 8: AGE AT WHICH RESPONDENTS'
CHILDREN WERE WEANED

AGE IN MONTHS	NUMBER OF RESPONDENTS	PERCENTAGE
5 - 6	21	42
3 - 4	19	38
1 - 2	6	12
7	4	8
TOTAL	50	100

TABLE 9: TYPES OF SEMI-SOLID FOODS WHICH
RESPONDENTS GIVE TO THEIR CHILDREN

CLASS OF FOOD	NUMBER OF RESPONSES	PERCENTAGE
Carbohydrates	51	41
Proteins	40	32
Vitamins	33	27
TOTAL	124	100

TABLE 10: TYPES OF FOODS RESPONDENTS ADD
TO THEIR CHILDREN'S PORRIDGE

CLASS	NUMBER OF RESPONSES	PERCENTAGE
Body building foods	87	73
Energy foods	23	19
Protective food	10	8
TOTAL	120	100

TABLE 11: FEEDING UTENSILS USED BY
RESPONDENTS

UTENSIL	NUMBER OF RESPONSES	PERCENTAGE
Plate and spoon	23	44
Cup and spoon	22	42
Feeding bottle	5	10
Hand	2	4
TOTAL	52	100

TABLE 12: RESPONDENTS' ABILITY TO PREPARE
THEIR CHILDREN'S FOOD

ABILITY TO PREPARE FOOD	NUMBER OF RESPONDENTS	PERCENTAGE
Has some idea how to prepare food	37	74
Completely ignorant	12	24
Prepares food well	1	2
TOTAL	50	100

**TABLE 13: COOKING PRACTICES AMONG
RESPONDENTS' FAMILIES**

PRACTICE	NUMBER OF RESPONDENTS	PERCENTAGE
Child's food cooked separately	30	60
Sometimes child's food cooked together with that for the family	20	40
TOTAL	50	100

**TABLE 14: PLACES WHERE RESPONDENTS
STORE COOKED AND UNCOOKED FOOD**

PLACE	NUMBER OF RESPONSES	PERCENTAGE	UNCOOKED PLACE	NUMBER OF RESPONSES	PERCENTAGE
Cupboard	52	62	Cupboard	32	54
Uncovered container in house	21	25	Uncovered container in house	14	24
Covered container in house	7	8	Covered container in house	9	15
Fridge	4	5	Fridge	4	7
TOTAL	84	100	TOTAL	59	100

**TABLE 15: NUMBER OF TIMES RESPONDENTS FEED
THEIR CHILDREN PER DAY**

NUMBER OF TIMES	NUMBER OF RESPONDENTS	PERCENTAGE
3 - 4	31	62
5 - 6	14	28
Twice or less	5	10
TOTAL	50	100

**TABLE 16: WHAT SUBJECTS DO WITH
FOOD LEFT OVER BY THEIR CHILDREN**

ACTION	NUMBER OF RESPONSES	PERCENTAGE
Thrown away	25	44
Given to older children	22	39
Kept for next feed	9	16
Other	1	1
TOTAL	57	100

**TABLE 17: PERSONS WHO LOOK AFTER THE
CHILDREN WHEN RESPONDENTS
ARE AWAY FROM HOME**

PERSONS	NUMBER OF RESPONDENTS	PERCENTAGE
Respondents relatives	22	44
Do not go away (self)	20	40
Older siblings	7	14
Nanny	1	2
TOTAL	50	100

TABLE 18: AGE DISTRIBUTION OF PERSONS WHO PREPARE FOOD FOR RESPONDENTS' CHILDREN

AGE RANGE	NUMBER OF RESPONDENTS	PERCENTAGE
18 and above	35	70
13 - 17	11	22
8 - 12	2	4
Does not know	2	4
TOTAL	50	100

TABLE 19: EDUCATIONAL ATTAINMENT OF PERSONS WHO PREPARE FOOD FOR RESPONDENTS' CHILDREN

OTHER PERSONS			RESPONDENTS THEMSELVES		
EDUCATIONAL LEVEL	NUMBER OF RESPONDENTS	PERCENTAGE	EDUCATIONAL LEVEL	NUMBER OF RESPONDENTS	PERCENTAGE
Primary	24	80	Primary	14	70
Secondary	3	10	None	4	20
None	3	10	Secondary	2	10
TOTAL	30	100	TOTAL	20	100

**TABLE 20: NUMBER OF DIARRHOEAL ATTACKS
RESPONDENTS' CHILDREN HAVE
HAD IN THE LAST TWELVE (12) MONTHS**

NUMBER OF ATTACKS	NUMBER OF RESPONDENTS	PERCENTAGE
Several times	35	70
4 - 7 times	13	26
8 - 11 times	1	2
12 times and above	1	2
TOTAL	50	100

**TABLE 21: WHAT RESPONDENTS THINK ARE THE
CAUSES OF RECURRENT DIARRHOEA**

CAUSE	NUMBER OF RESPONSES	PERCENTAGE
Does not know	21	30
Ill-prepared food	21	30
Unhygienic conditions	11	16
Teething	9	13
Other	8	11
TOTAL	70	100

**TABLE 22: TYPE OF TOILET FACILITIES
AVAILABLE IN RESPONDENTS' HOMES**

TYPE	NUMBER OF RESPONDENTS	PERCENTAGE
Pit latrine	35	70
FlMah toilet	12	24
None	3	6
TOTAL	50	100

**TABLE 23: HOW RESPONDENTS
DISPOSE OFF REFUSE**

METHOD	NUMBER OF RESPONSES	PERCENTAGE
Throw into rubbish pit	23	39
Throw into surrounding grass	12	20
Bury the rubbish	8	14
Throw into bush far from house	6	10
Throw into ditch near house	4	7
Throw into back yard garden	3	5
Throw over fence at the back of house	2	3
Throw onto rubbish heap	1	2
TOTAL	59	100

**TABLE 24: NUMBER OF RESPONDENTS WHO HAVE RECEIVED
HEALTH EDUCATION ON RECURRENT DIARRHOEA ON
ADMISSION**

RESPONSE	NUMBER OF RESPONDENTS	PERCENTAGE
No	28	56
Yes	22	44
TOTAL	50	100

TABLE 25: NUMBER OF TIMES RESPONDENTS' CHILDREN HAVE BEEN ADMITTED WITH RECURRENT DIARRHOEA IN THE LAST TWELVE (12) MONTHS

TIMES	NUMBER OF RESPONDENTS	PERCENTAGE
Once	33	66
Twice	13	26
Thrice	3	6
Four times	1	2
TOTAL	50	100

TABLE 26: REASONS FOR RESPONDENTS' INABILITY TO PRACTICE WHAT THEY ARE TAUGHT AT HEALTH CENTRE OR HOSPITAL

REASONS	NUMBER OF RESPONSES	PERCENTAGE
Financial limitations	40	45
Educational limitation	25	28
Absence from home for part or whole day	9	10
Non-availability of items	8	9
Lack of support and encouragement at home from nurses	4	5
Infrequent visits to health centre	3	3
TOTAL	89	100

**TABLE 27: RESPONDENTS WHO HAVE SEEN NURSES
IN THEIR COMPOUNDS AND RESPONDENTS
WHO HAVE BEEN VISITED BY NURSES
IN THEIR HOMES**

RESPONDENTS WHO HAVE SEEN NURSES IN THEIR COMPOUNDS			RESPONDENTS WHO HAVE BEEN VISITED BY NURSES IN THEIR HOMES		
RESPONSE	NUMBER OF RESPONDENTS	PERCENTAGE	RESPONSE	NUMBER OF RESPONDENTS	PERCENTAGE
No	36	72	No	45	90
Yes	14	28	Yes	5	10
TOTAL	50	100	TOTAL	50	100

Ten (10) percent of respondents were visited at home by public health nurses, other nurses and nutrition demonstrators who demonstrated how to cook nutritious foods. Six (6) percent of the respondents were visited twice while four (4) percent were visited once only. Diarrhoea and malnutrition were discussed during two visits. Malnutrition only was discussed during the remaining six (6) home visits. Cookery demonstrations were conducted during two (2) visits.

CHAPTER 6DISCUSSION OF FINDINGS, NURSING IMPLICATIONS,
CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS
OF THE STUDY.DISCUSSION OF FINDINGS

The results of the study are based on the analysis of responses from fifty (50) mothers of children who were admitted to hospital with a history of recurrent diarrhoea and malnutrition who were included in the sample. The aim of the study was to determine the relationship between recurrent diarrhoea and malnutrition in children at the weaning stage admitted to University Teaching Hospital.

Table 1. p. 30 shows the age distribution of respondents. The age ranged between 18 to 42 years. The majority of respondents (40 percent) were aged between 18 and 22 years, (30 percent) between 23 and 27 years, (14 percent) between 33 and 37 years and the remainder (10 percent) between 38 and 42 years. The majority of subjects were young and lacked knowledge and experience in looking after children. Young urban mothers might have not been trained since childhood for their motherhood role. Once married, they often live away from parents who were formerly available for advice as the need arose. While (80 percent) of respondents had attended school, only (18 percent) had some schooling beyond the primary level and (20 percent) were illiterate (table 2. p. 30). This may be due to inadequate school places provided by the Ministry of General Education and Culture. In addition, the attitude of parents that girls were economically unimportant could have discouraged girls to go for secondary education.

Linked to women's deficient education, is their lack of sufficient knowledge about when, how and what type of weaning food to give to their children, particularly among the urban poor. Education enables the respondents to perceive the risks associated with recurrent diarrhoea and to take preventive measures that would reduce morbidity and mortality among weanlings.

Education may also reflect a number of other dimensions such as the woman's age, as mentioned earlier, and her occupation as shown in table 3. p. 30 . The majority of respondents (54 percent) were housewives thus, non income-generators, twenty-eight (28) percent were marketeers or street vendors or engaged in some petty trade, ten (10) percent were employed as house maids or tailors, eight (8) percent were unemployed, depending on relatives, mostly parents, for the provision of food for their children and only (2 percent) were engaged in subsistence farming. All the respondents belonged to the low socio-economic group. Their low purchasing power coupled with high rising cost of food makes it difficult for them to buy adequate nutritious food for their children. This may lead to malnutrition which impairs host defence. Low resistance to infection coupled with unhygienic conditions under which they were reared makes the weanlings susceptible to repeated attacks of diarrhoea with subsequent malnutrition.

Table 4. p. 31 shows that sixty two (62) percent of respondents spent most of their time at home leaving only for brief periods on errands such as buying food at the market. This enables the respondents to give the right frequencies of feeds without delegating the responsibility to an older child who may not prepare them properly.

Twenty (20) percent of subjects were away from home for part of the day while eighteen (18) percent were absent from home the whole day. Absence of the mother from home contributes to the high incidence of diarrhoea with subsequent malnutrition because the children may be fed with contaminated food prepared by other persons who may lack personal and domestic hygiene.

Table 5. p. 31 shows that sixty-two (62) percent of respondents lived in high density areas where poor environmental sanitation makes it difficult for a mother to institute good hygiene in food handling, where due to overcrowding, the normal garden space is not available for a mother to produce the much needed green leafy vegetables for the child's protective food requirement but vegetables can still be grown in pots and tins although this takes a lot of imagination. Hofvander (1981) in her paper on the problem of weaning in Africa reported that in the common unhygienic environment any additional food carries risk of recurrent diarrhoea with subsequent malnutrition. Twenty two (22) percent of subjects lived in medium density areas while fourteen (14) percent lived in the village, farm and low density areas.

In table 6. p. 31, findings reveal that fifty (50) percent of respondents had 1 or 2 children. This may be because most of the subjects (table 1 p. 30) were young and just starting families. Thirty (30) percent of subjects had 3 or 4 children, twelve (12) percent had 5 or 6 children, six (6) percent had 7 or 8 children and two (2) percent had 9 children and above. Recurrent diarrhoea and consequential malnutrition occur more commonly in large families because high standard of personal and domestic hygiene is difficult to maintain due to overcrowding (Munyashongore, 1981). Munyashongore states that food available decreases when the family is a large one.

The largest number (32 percent) of children admitted to hospital were aged between 18 and 22 months. This may be because at this age children are very active and mobile. They eat any food they come across, some of which, may be contaminated. They become infected with diarrhoea causing pathogens. Thirty (30) percent of the children were aged between 13 and 17 months, twenty six (26) percent between 8 and 12 months and twelve (12) percent between 23 and 27 months (table 7 p. 32).

The majority of respondents (42 percent) weaned their children at the age of 5 to 6 months. Four (4) months is the recommended age by W.H.O. (Hofvander 1981). Gurney (1983) argues against the statement by Hofvander by saying that weaning varies according to the circumstances of each family. For example a working mother may need to wean early on resumption of work at the end of her maternity leave while a mother in a shanty compound where sanitation and cooking facilities are poor may be advised to wean later than is usual to avoid contamination of food which may lead to recurrent diarrhoea with subsequent malnutrition. Thirty-eight (38) percent weaned at 3 to 4 months, twelve (12) percent at 1 to 2 months and the remainder eight (8) percent at 7 months. Early weaning and late weaning may be caused by ill advice from health workers (Hofvander, 1981). This may be due to lack of proper explanations (Table 8 p. 32).

Diarrhoea Dialogue (1983) reports that cereal gruel or pap inadequate nutritionally is given as weaning food in many places. Thin porridge was given to the child because his chewing apparatus has not fully developed. Giving lumpy food to a small weanling would cause recurrent dietary diarrhoea with subsequent malnutrition. The porridge became thicker until he was able to chew.

Thick porridge with relish was then introduced. Gurney (1981) says that a porridge using the staple mixed with something extra was excellent. Thirty two (32) percent of respondents gave proteins while twenty seven (27) percent gave vitamins (Table 9 p. 32). Gurney (1983) states that suitable recipes and methods of preparing weaning food can be developed in most cultures.

The findings in table 10 p. 33 reveal that seventy-three (73) percent of respondents mixed porridge with proteins. Pounded groundnuts was most frequently cited, milk second, kepenta third and mashed beans last. The correct dilution of milk formulae mixed with porridge was not known because the respondents who offered it in that form were not able to follow instructions. Fresh milk was overdiluted. Poverty and ignorance encourage dilute milk feeds (Maletnlema, 1981). In fact, respondent number 21 diluted one (1) cup of milk to five (5) cups of water. An interesting revelation was the concoction of tea, milk, egg, sugar and salt given to a child by respondent number 33. The mixture besides being unpalatable, would cause dietary recurrent diarrhoea in a weanling. Respondents numbers 4 and 43 mixed water used for cooking rape with porridge. This is in line with Kakikani (1981) who criticizes the habit of discarding large quantities of water used for boiling green vegetables leading to loss of nutrients especially Vitamin B Complex. But the nutrients were destroyed by over cooking the porridge to which the water was added.

Many weaning porridges contain inadequate energy for the baby's needs. The porridge is bulky due to large quantities of water taken up by starch used during the cooking. Ignorant mothers may mistake the bulkiness of the porridge for large volume of food and adequate energy and continue to underfeed the child which may lead to malnutrition and later to recurrent diarrhoea - malnutrition complex.

Gurney (1983) recommends additional oil to porridge to increase the energy content and change the consistency of the porridge thus, making it easy to swallow. Nineteen (19) percent of the respondents mixed cooking oil, margarine, butter and sugar with porridge while eight (8) percent used vitamins in the form of green leafy vegetables and fresh fruit especially mangoes during the rain season.

Forty-four (44) percent of subjects used a plate and spoon to feed their children. Feeding with plate and spoon may lead to a waste of food due to spilling especially if handled by an inexperienced person. Forty-two (42) percent fed their children with cup and spoon (Table 11 p.33). Feeding with cup and spoon is better than using a bottle or hand which ten (10) and four (4) percent mothers used respectively. The cup and spoon are easy to clean especially in unsanitary environment where facilities for sterilizing bottles and rubber teats are unavailable.

The cup and spoon are suitable for giving weaning foods, this allows the mother to change the food from liquid to semi-solid as the baby grows (Gurney, 1983). In addition, as the child grows, he would be encouraged to try new foods and to eat what he is given if he is allowed to handle the food and try to feed himself. Furthermore, he will have his hands washed before eating. A child who is taught and encouraged early in life to wash his hands before handling food may continue the practice and this reduces the incidence of recurrent diarrhoea with subsequent malnutrition. In addition, he can even eat a family meal at his own speed under the supervision of the mother thereby minimizing dietary recurrent diarrhoea.

Dirty hands and dirty kitchen utensils which are poorly cleaned and exposed to open air may be a source of recurrent diarrhoea especially if feeding bottles and rubber teats are poorly cleaned and sterilized and retain traces of milk or milk formulae. The findings reveal that seventy-four (74) percent of respondents had little idea how to prepare food (Table 12 p. 33). Twenty-four (24) percent were completely ignorant and only two (2) percent knew how to prepare food properly - the only percentage of respondents who stated they wash their hands before preparing the food. This finding is supported by the observation made by the investigator during the interviews. The respondents washed their hands before they fed their children, but they did not say so during the actual interview, except respondent number 15 who even explained the importance of such a practice.

Another interesting observation was the way respondents, out of habit, picked peeled oranges dropped by their children from the floor and gave them to the weanlings without washing the fruit first. It is doubtful if they practiced hand washing before preparing food and feeding at home. Handwashing (with soap if possible) before food preparation and consumption is an essential preventive measure against recurrent diarrhoea with subsequent malnutrition (International Conference 1984, Bishop, 1984 and Balldin et al, 1984).

Four (4) percent of the subjects dried utensils in the open air and left them there until the next food preparation. These utensils may easily be contaminated by dust and flies. The findings reveal that the majority of respondents did not possess in-depth knowledge about the preparation of weaning food. Thus, hypothesis number 1 which states, "Mothers' lack of knowledge of types of and preparation of weaning food contributes to recurrent diarrhoea and consequently malnutrition" is accepted.

Table 13 p. 34 shows that sixty (60) percent of respondents prepared the food for the child separately. This is because the subjects wanted to ensure the food was cooked properly. Forty (40) percent sometimes cooked the family food and took a portion for the child. This would save fuel, food and time but it takes a lot of intelligence for a mother to select from the family pot the right food and amount to meet the child's needs. In cultures where the father is given the most prestigious and nutritious portion of the food, even though the mother knows that the child's needs have to be met, recurrent dietary diarrhoea with subsequent malnutrition would be common. If nurses and public health nurses knew and understood the customs and values in different cultures, they would advise parents about the importance of giving children the right quality and quantity of food to prevent recurrent dietary diarrhoea with subsequent malnutrition.

Due to the rising cost of commodities and transport, there is a tendency for mothers to buy in bulk and to prepare weaning food to last a day. Poor storage before and after preparation exposes food to pathogens (Matelnlema, 1981). Table 14 p. 34 shows the different places where respondents stored cooked and uncooked food. Sixty-two (62) percent of respondents stored cooked food in lockable cupboards, twenty-five (25) percent in uncovered containers, eight (8) percent in covered containers and five (5) percent in fridges. Similarly, fifty-four (54) percent of respondents kept uncooked food in paper bags, plastic bags, and pots in cupboard, twenty four (24) percent in uncovered containers: baskets, basins and buckets, fifteen (15) percent in covered containers: pots, plastic bags, paper bags and seven (7) percent in the fridge. It was interesting to ^{note that} food was stored in lockable cupboards and covered containers to stop children from getting at it and not for hygienic reasons.

Respondent number 30 went as far as hiding the food under the bed. Twenty-eight (28) percent of subjects hang food containing bags and buckets on wall nails for the same reason. Fresh meat was dried on the washing line in the sun. It was thus heavily contaminated by flies. It may not be thoroughly cooked before it is consumed by children which may cause recurrent diarrhoea and consequent malnutrition in weanlings. In low socio-economic communities, the high incidence of diarrhoea could also be due to giving left over food which is not thoroughly re-heated. If public health nurses and other nurses stressed to the mother the importance of covering food, not leaving it sitting around and offering fresh clean food to children, recurrent diarrhoea and consequent malnutrition together with infant morbidity and mortality due to diarrhoea would be reduced greatly.

The low socio-economic group in Zambia may have two (2) or three meals (3) per day depending on whether food and fuel are available. The children's feeding times are made to fit into the adult's feeding pattern. Table 15. p.34 shows that sixty-two (62) percent of respondents fed their children 3 to 4 times a day. This is inadequate for a weanling whose stomach is small and requires frequent small meals. Gurney (1983) suggests that the frequency of feeding should increase rapidly until the baby is soon taking at least five (5) meals a day in addition to the breast milk because he is growing fast. Little and often is the rule. He adds that the food should be rich in dietary energy. Snacks such as fruit between meals should provide vitamins which are necessary to help combat recurrent diarrhoea and consequential malnutrition. Appetite plays an important role in the control of food intake. Twenty-eight (28) percent of subjects fed their children 5 to 6 times a day despite the anorexia which is so common with recurrent diarrhoea.

Ghosh (1985) says that small quantities of soft foods requiring no chewing should be offered to the child and be persuaded to eat.

Crying too much between meals was a reason given for feeding frequently. The child was fed on demand. This could be due to inadequate food intake at each meal. Although the mother knew about the need to increase the food as the child grows she was unable to give him enough at each meal due to small amount of food available in the home. One (1) percent of respondents fed their children twice or once a day. Children who are fed twice or less a day risked fatality. Respondents numbers 9 and 51 did not see the need for a child who was not vomiting to be fed intravenously. If nurses explained to the mother why it is so important to be patient and to persevere when they feed an anorexic child, the weanlings would take more food and reduce the occurrence of diarrhoea/malnutrition complex. Shortage of food, fuel and water in the low socio-economic communities might have contributed to the small number of respondents who fed their children at the right frequencies.

Transmission of recurrent diarrhoea should be prevented by not allowing other children to share the food that is left over by the weanling who has the disease. The majority (44 percent) of the respondents threw away the food left over by the children, thirty nine (39) percent gave it to older children, sixteen (16) percent kept it for the next feed and one (1) percent ate it herself (table 16 p. 35). If nurses advised mothers to maximize utilization of any food prepared, multiplication of micro-organisms in left over food left standing for a long time would be reduced thus, prevent recurrent diarrhoea and consequential malnutrition. Weaning food should be eaten in one meal (Cameron and Hofvander, 1976).

The majority, (44 percent) of subjects left their children in the care of relatives when they were away from home while forty (40) percent did not leave home often, when they did, they took their children with them. Fourteen (14) percent delegated the responsibility to the older sibling and only two (2) percent left the child with a nanny (table 17 p. 35). The ages of the other persons who took care of the children in the absence of the respondents ranged from eight (8) to eighteen (18) years and above. Seventy (70) percent were 18 years and above (respondents' mothers and sisters) twenty-two (22) percent from 13 to 17 years, four (4) percent from 8 to 12 years while four (4) percent did not know the ages (table 18 p. 35).

Eighty (80) percent of the often surrogate mothers had attained primary level of education (table 19 p. 36) while ten (10) percent had secondary education and another ten (10) percent had no education. The level of knowledge about hygienic feeding of children depends on age and educational level of the surrogate mothers. The respondents' mother may not know how to prepare the food properly while the older sibling may be too young to take the added responsibility in looking after children. The findings reveal that the majority of the other persons who prepared food for the children when mothers were away from home were adults. Thus, hypothesis number 2 which states that weanlings who are looked after by young and inexperienced nannies or siblings suffer from recurrent diarrhoea and subsequent malnutrition more than those who are cared for by their mothers is rejected.

Table 20 p. 37 shows the number of diarrhoeal attacks respondents' children have had within the last twelve (12) months. Seventy (70) percent of respondents reported that their children have had several episodes, children of twenty six (26) percent of respondents had 4 to 7 attacks while those of two (2) percent had 8 to 11 attacks and another two (2) percent had children who had 8 to 11 bouts and the remainder two (2) percent had children who

suffered 12 attacks and above. Respondents' failure to give a definite number of episodes of diarrhoea their children have had may be a result of children having too many that they have lost count. It could also be due to their low educational level that they had forgotten the number. Weaning is often a protracted process associated with diarrhoea up to nine episodes per year between six (6) and thirty six (36) months (Molla et al, 1983).

Unfortunately, thirty (30) percent of subjects did not know the causes of recurrent diarrhoea and consequential malnutrition (table 21. p. 37). ~~Badly~~ prepared food was cited by thirty (30) percent, unhygienic conditions by sixteen (16) percent, teething by thirteen (13) percent and beer drinking by mother and medicine by eleven (11) percent. Lack of association between poor personal and domestic hygiene and recurrent diarrhoea by the respondents may lead to more severe and longer lasting attacks of diarrhoea and higher morbidity and mortality rates among weanlings.

Water supply and sanitation complement each other and play a significant role in the prevention of recurrent diarrhoea and consequential malnutrition. Although the majority, (96 percent) of respondents have water supply near the house (table 22 p. 37), the frequent trips made to collect it from the nearest tap is time consuming. Water kept in plastic containers and buckets is used for drinking, cooking and washing of clothes and bodies, the washing of hands may seem as a waste of water. This could be one of the reasons for non-hand washing practice among subjects in the study. In the low socio-economic communities where most houses have no water taps indoors, all the children of the household use the same water when washing their hands which may become contaminated thus leading to repeated episodes of diarrhoea and consequently malnutrition.

Using a cup or kettle to pour water on the hands of the one washing and use of a bowl to collect water later for disposal would greatly reduce water and food contamination and morbidity and mortality due to recurrent diarrhoea and consequential malnutrition.

Table 22 p. 37 shows that seventy (70) percent of respondents used pit latrines. If not properly constructed, the pit latrines can be a health hazard, spreading infection through contamination of water and food. Flies from the toilet settle on the food and convey micro-organisms. In addition, pit latrines can be dangerous to the users particularly children and especially during the rain season, when they may collapse. Bad smell, wobbly squatting slabs and lack of privacy may prevent people from using them. If better designed latrines such as the ventilated improved (VIP) latrines were provided for each family and household members encouraged to use them there would be a reduction in the incidence of recurrent diarrhoea and subsequent malnutrition. Twenty four (24) percent use flush toilets and six (6) percent have no facilities. Provision and effective use of appropriate latrines will benefit children reared in unhygienic conditions and perpetually suffering from gastro-entritis (Read, 1981).

Proper disposal of rubbish prevents fly breeding (Balldin et al, 1984). Table 23 p. 38 shows that thirty-nine (39) percent of subjects throw refuse into a rubbish pit but none of the respondents covered the rubbish with a layer of soil to prevent flies from settling on it. Rowland (1981) in his bacteriological examination of household water pots showed heavy contamination with micro-organisms. It may be difficult to avoid this in unsanitary environment where water is kept in containers without lids and in residential areas where refuse collection facilities are virtually non-existent.



This would lead to repeated episodes of diarrhoea with subsequent malnutrition. Twenty (20) percent threw refuse in the surrounding grass, fourteen (14) percent buried it, ten (10) percent threw it into the bush far from the house and ^{the} remaining seventeen (17) percent threw theirs in ditches near the house, over the fence in back yard and onto the rubbish heap. The findings reveal that the majority of respondents reside in unsanitary environments. Thus, the third hypothesis which states, "Children from good sanitary environments get recurrent diarrhoea and consequently malnutrition less frequently than those living in poor sanitary environment" is accepted.

Health education is the most important instrument for the prevention of recurrent diarrhoea and consequent malnutrition (International Children's Centre, 1985). Table 24 p. 38 shows that fifty six (56) percent of respondents received no health education while forty-four (44) percent were given some health education since their children's admission to hospital. This is because respondents who were admitted the day before and on the day of the interviews were included in the sample. It could also be due to shortage of staff at the institution. There are rarely enough nurses on the wards to supervise mothers and give individual advice according to the needs of each respondents' child (William, 1980).

In situations where nurses appear to be busy, mothers are afraid to ask for help or advice (Simwanza, 1984). If nurses gave education on the causes and prevention of recurrent diarrhoea and consequent malnutrition to mothers while they are in hospital on individual basis as opposed to group discussion, respondents would learn something which they would practice at home to reduce the incidence of recurrent diarrhoea and malnutrition and repeated admissions of children with the same disease.

Table 25 p. 39 shows the number of times respondents' children have been admitted to hospital with the same disease within the last 12 months.

Children of sixty-six (66) percent of respondents were admitted once only. This may be due to the easy accessibility to the health centre by the respondents. Their children might have been receiving treatment and health education before they were referred to hospital. Twenty-six (26) percent had their children readmitted twice, six (6) percent thrice and two (2) percent four (4) times. The findings of the study show that the majority of the respondents had their children admitted to hospital only once. Thus, hypothesis number four (4) which states that children who have had more than four (4) episodes of diarrhoea show signs of malnutrition is rejected.

Reasons for respondents' inability to practice what they were taught at the health centre or in the hospital varied. Financial limitations were cited by forty-three (43) percent of subjects, educational limitations by twenty seven (27) percent, absence from home by ten (10) percent, non availability of food stuffs and other items by nine (9) percent, lack of support and encouragement at home from nurses by eight (8) percent, infrequent visits to the health centre and discontinuation of supplementary food programme by three (3) percent (table 26. p. 39).

Respondents in the low income group find it difficult to provide enough food for their children and to prevent recurrent diarrhoea and consequent ^{ial} malnutrition through improved standard of hygiene due to lack of means of raising enough money. For example, sixty-two (62) percent of the respondents had to clean utensils with mealie-meal instead of soap. If the policy makers considered the effect that inflation was having on the health of the children and reduced the prices of items that are essential for the healthy growth of the children in this age group, the mothers might be able to manage and thus minimise the incidence of diarrhoea and consequent malnutrition.

Unfortunately, a large percentage (72) of respondents said that they have not seen public health nurses and other nurses in their compounds. Ninety (90) percent have not been visited in their homes by these same categories of nurses. In fact, recurrent diarrhoea and consequent^{ial} malnutrition were only discussed during two home visits (table 27 p. 40). Regular home visiting would facilitate identification of infant feeding and child care practices that can best reduce recurrent diarrhoea and consequential malnutrition because according to Bhatia and Cutting (1984), teaching in homes enables health workers to observe and ensure that the mother understands what she has been taught. If nurses, as supporters, are enthusiastic and committed, mothers are more likely to succeed.

OBSERVATIONS MADE DURING THE INTERVIEW

Respondents washed their hands after the nurse had asked them to do so. After a while, out of habit, respondents fed their children without washing hands. Children who were big enough to feed themselves did so without having their hands washed by their mothers first. Food which dropped onto the floor was picked and offered to the child without washing it first. It is obvious learning has not taken place. Poor communication may be one of the most frequent causes for failure of mothers to follow instructions given by the nurses. The investigator observed that nurses told mothers to wash their hands before feeding the children without giving clear rationales. Illiteracy was high among respondents thus, communication became even more difficult. Furthermore, nurses always seemed to be rather in a hurry to stop and attend to the child's needs presented by respondents.

Fendall and Shatlock (1980) say that when illiteracy is high among clients, communication becomes even more difficult but people can learn new concepts that are clearly presented.

There was lack of supervision of respondents by nurses during feeding time. The mothers of anorexic children sat without making an effort to persuade them to eat. The respondents concluded and maintained that the child did not want to eat when he turned away his face from the plate of food or he shook his head. Repeated episodes of diarrhoea coupled with inadequate feeding leads to malnutrition with its effects on the host defence. The weanlings suffer more severe attacks of recurrent diarrhoea and further malnutrition. Admission of mothers to hospital provides an opportunity for health education and supervision by the nurse and advice about how the child should be cared for at home.

In conclusion, the findings of the study reveal that recurrent diarrhoea and subsequent malnutrition are still a major problem especially among low socio-economic communities. This is due to lack of adequate and effective preventive education to the mothers. Their lack of knowledge about the causes and prevention of recurrent diarrhoea and consequential malnutrition contributes to repeated admissions to hospital of weanlings suffering from the same disease. The disease can be reduced with simple measures that can be effectively carried out by the mothers themselves in their homes (Bukonya, 1982).

NURSING IMPLICATIONS

The results of the study show that recurrent diarrhoea and malnutrition are not discussed in the health centres or hospital as a single entity. It is separated into two and more emphasis is placed on malnutrition.

The result is that diarrhoea is neither discussed by nurses on the curative side nor those on the maternal and child health service side. This is unfortunately practiced in the hospital as well. In order to change the mothers' behaviour, home visiting by public health nurses and other nurses should be intensified especially to those mothers who are slow learners. Follow up home visiting of children who are identified in the health centres and on discharge from hospital should be done regularly to enable both the nurse and the mother to monitor the progress of the child. More nurses should be involved in home visiting.

Nurses conducting follow up home visiting should identify other resources in the community which could help to reduce recurrent diarrhoea and consequential malnutrition because water supply and sanitation improvement and hygiene should be tackled together in order to achieve any reduction in the disease incidence. Mothers should be taught measures to improve sanitation and hygiene such as covering the refuse with ^a layer of soil each time rubbish is thrown into the rubbish pit, washing of hands before food preparation and consumption, teaching children the practice of hand washing early and involving mothers from planning through to evaluation stage.

Health teaching methods should be improved with greater participation by the mothers, as opposed to the passive recipient role they are made to play. Creativity is important when teaching illiterate communities (Fendall and Shattlock, 1980). Slides taken of local situations and discussions featuring the mothers would have greater impact than showing slides of strange places as is the current practice. Nurses lacking knowledge in health education should be given in-service education to remove the feeling of inadequacy and their lack of responsibility towards this activity.

3. CONCLUSIONS

Preventive health education is an important aspect of recurrent diarrhoea and malnutrition control programme. The results of the study reveal that home visiting especially follow up home visiting has been seriously neglected. Only a few respondents had an idea of what caused recurrent diarrhoea and consequential malnutrition. A small percentage knew what type of food to give to weanlings, when to give it and how often. A smaller percentage still associated poor environment with recurrent diarrhoea and malnutrition. To a mother whose weanling suffers attacks of diarrhoea, the disease is part of the child's constitution and thus takes action when the condition deteriorates, often with serious consequences and sometimes fatality.

It has been observed that mothers stop trying when there is no support given by the nurses. Public health nurses and other nurses working with mothers should use those who are motivated to motivate others and thus reach a larger number of the community and together with the community try to find ways and means of improving environmental sanitation and personal and domestic hygiene in order to reduce the incidence of recurrent diarrhoea and malnutrition; and mortality.

4. RECOMMENDATIONS

1. A study of this kind should be conducted on a larger scale to include other members of the multisectoral team in order to combine resources and tackle every aspect of recurrent diarrhoea and malnutrition control programmes. This approach will go a long way to lower morbidity and mortality rates arising from preventable diseases/conditions.

2. Improved co-operation with other sectors outside the health service to provide the necessary infrastructure to reach a larger population is necessary.
3. Improved communication and intensive use of mass media:- radio and TV (even mothers with TV can have children with recurrent diarrhoea and malnutrition at the weaning stage). Presently the media are not being utilized to capacity on health matters so that large communities will benefit from this communication particularly remote areas of the country.
4. Health institutions should conduct seminars, workshops and refresher courses for nurses on the importance of preventive health education for mothers of weanlings in order to reduce the high incidence of diarrhoea and subsequently malnutrition.
5. Provincial public health nurses should involve more nurses in health education on nutrition topics and supervise nutrition demonstrators to ensure proper coverage of the topic in order to lower infant morbidity and mortality due to recurrent diarrhoea and consequential malnutrition.
6. All nurses, including those on the curative side, who deal with children suffering from recurrent diarrhoea and subsequent malnutrition should give health education on individual basis as opposed to the current practice of referring the child to the Maternal and Child Health Services Section. This will reduce sickness in children and unnecessary deaths from preventable diseases/conditions.
7. More supervision of nurses in the field by senior nurses at provincial and national levels to monitor and evaluate the diarrhoeal disease control programme should be re-inforced.

5. LIMITATIONS OF THE STUDY

During the study, several limitations were observed. The time within which the study was to be conducted was limited. The small sample size of fifty (50) was as a result of the time limit. The study was limited to three (3) wards and the subjects interviewed were only those whose children were admitted with recurrent diarrhoea and malnutrition. Therefore, the findings cannot be generalized to a larger population of mothers of weanlings suffering from the above disease.

The interview schedule was not pretested due to the limited time, the reliability of the instrument is, therefore, questionable. The local literature done on the study was extremely limited. This contributed to the language problem experienced by the investigator because in the absence of local literature it was difficult to find suitable local words which would have the proper meaning for some English words. Furthermore, the majority of the sample was illiterate. The investigator was not competent enough in Nyanja to facilitate a quick and smooth interview. The respondents had difficulty to understand what information the interviewer was trying to obtain. A student nurse assisted by interpreting for the interviewer. The interviews took longer than was planned.

Another limitation was the cost in terms of paper, typing fees, binding and time availability to wait while respondents finished feeding their children.

APPENDIX 1

The University of Zambia,
School of Medicine,
Department of Post-Basic Nursing,
P. O. Box 50110,
LUSAKA.

15th March, 1986

The Principal Nursing Officer,
University Teaching Hospital,
Board of Management,
Private Bag R.W. 1,
LUSAKA.

ATTENTION: NURSING OFFICER, PAEDIATRIC WARD

Dear Madam,

I am a student at the above-named department pursuing a Bachelor of Science degree in Nursing. In partial fulfilment of the requirements, I am expected to carry out a research study in the area of Community Nursing.

I am concerned with the repeated admissions to your Unit of children with recurrent diarrhoea and malnutrition at the weaning stage. I am, therefore, interested to find out what mothers think are the causes of recurrent diarrhoea and malnutrition and what they can do to prevent it.

I should be grateful if you would allow me to interview 50 mothers whose children will be in your wards in March, 1986.

Your assistance in granting me permission will be greatly appreciated.

Yours faithfully,

W. C. Kasapo
WINFRED C. KASAPO

63/.....

APPENDIX 2

UNIVERSITY TEACHING HOSPITAL,
DEPARTMENT OF PAEDIATRICS & CHILD HEALTH,
PRIVATE BAG RW 1,
LUSAKA, ZAMBIA.

2nd April, 1986.

Miss Winifred C. Kasapo,
Dept. of Post Basic Nursing
School of Medicine,
P. O. Box 50110,
LUSAKA.

Dear Miss Kasapo,

RE: RESEARCH PROJECT.

I refer to your letter regarding your request for permission to carry out research in our department.

I am pleased to inform you that you are welcome. In order to make your work easy, please report to the office of the matron so that you can be introduced to the area of your need.

Wishing you all the success in your project.

Yours sincerely,

M. K. Chisembele,
ACTG. NURSING OFFICER

STRUCTURED INTERVIEW SCHEDULE FOR MOTHERS

APPENDIX 3

FOR OFFICIAL USE

1. How old are you?

Number

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1

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2

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3

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4

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5

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6

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7

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2. Did you have an opportunity to go to School?

1 Yes

2 No

3. What is your educational attainment?

1 None

2 Primary

3 Secondary

4 College

5 University

4. What is your occupation?

5. Does your occupation keep you away from home?

1 Not at all

2 Part of the day

3 All day

6. In which part of Lusaka do you live?

7. How many children do you have?

8. How old is this child?

8

9. How old was the child when you started to feed it with other foods?

9

10. Did you continue breast feeding?

10

1 Yes

2 No

11. What semi-solid foods do you feed the child on?

11

1 Porridge

2 Milk formula

3 Other (Specify)

12

13

11a (If porridge) what do you add to the porridge?

14

15

16

11b (If milk formula) can you follow instructions on the tin?

17

1 Yes

2 No

11c If you can not follow the instructions how do you prepare the feed?

18

19

20

21

22

FOR OFFICIAL USE

12. What do you use for feeding the child?

1 Feeding bottle

2 Cup and spoon

3 Other (Specify)

23

24

25

13. Would you care to tell me how you prepare the food before feeding the child?

26

27

28

29

30

14. How do you clean and sterilize the things you use for preparing the food and feeding the child?

31

32

33

34

35

15. Do you prepare the child's food separately from that of the rest of the family?

36

--

1 Yes

2 No

16. Where do you keep the food before and after preparing it?

37

38

39

40

a. Where do you store the food before cooking it?

41

42

43

44

b. How is the food stored?

45

46

c. How do you store left over food?

47

48

49

50

17. How many times do you feed the child?

51

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18. What are your reasons for feeding the child that number of times?

52

53

54

19. If the child does not finish all the prepared food what do you do with the rest?

55

56

57

20. Who prepares the food and feeds the child when you are away from home?

58

--

1 Nanny

2 Older sibling

3 Other specify)

21. How old is the person who prepares the baby's food?

59

--

22. What is her educational attainment?

60

--

1 None

2 Primary

3 Secondary

23. Can she follow instructions on the tin (If milk formulae used)?

61

--

1 Yes

2 No

a. If she cannot follow instructions on the tin how does she prepare the food?

62

63

64

65

b. Can she follow your instructions?

66

--

1 Yes

2 No

24. Has this child suffered from diarrhoea since the other person started preparing the food?

1 Yes

2 No

67

--

25. How many times?

68

--

26. Does the other person know what causes recurrent diarrhoea?

69

--

1 Yes

2 No

a. What are the causes of recurrent diarrhoea?

- 1
- 2
- 3
- 4

71

- 71
- 72
- 73
- 74

27. Do you get enough water in or near your house?

- 1 Yes
- 2 No

75

--

28. What type of toilet facilities does your house have?

- 1 None
- 2 Communal
- 3 Pit latrine
- 4 Flush

76

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29. Is the refuse from your yard collected regularly?

- 1 Yes
- 2 No

77

--

30. How do you ensure that the refuse does not become a health hazard?

78

79
80
81

31. Do public health nurses or other nurses discuss recurrent diarrhoea and malnutrition with you when the child is admitted to the ward?

82

--

1 Yes

2 No

32. How many times has this child been admitted to hospital with the same disease in the last twelve months?

83

--

1 Once

2 Twice

3 Thrice

4 Four times

5 Five times and above

33. Can you practice what you are taught in hospital at home?

84

--

1 Yes

2 No

a. What are the reasons for not practicing what you are taught while in hospital at home?

85

86

87

88

34. Do public health nurses or other nurses visit your compound?

89

--

1 Yes

2 No

a. Have they been to your 'home'?

90

--

1 Yes

2 No

b. How many times have they visited you at home?

91

--

c. What did you discuss with them?

92

93

94

95

Thank you for your time.

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