

**EFFECTS OF INTERVENTION ON FEEDING PRACTICES
IN THE INTENSIVE CARE UNIT AT THE UNIVERSITY
TEACHING HOSPITAL, LUSAKA. ZAMBIA**

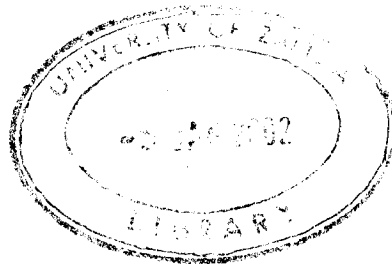
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**DR. MRS BEATRICE CHIFWELU AMADI, M.D
DEPARTMENT OF PAEDIATRIC AND CHILD HEALTH**

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CONTENTS

DECLARATION	4
STATEMENT	4
DEDICATION	4
ACKNOWLEDGEMENTS	5
SUMMARY	6
CHAPTER 1	8
INTRODUCTION	
CHAPTER 2	13
LITERATURE REVIEW	
CHAPTER 3	21
1. OBJECTIVES:	
- MAIN OBJECTIVE	
- SPECIFIC OBJECTIVES	
2. STUDY JUSTIFICATION	

CHAPTER 4	23
MATERIALS AND METHODS	
CHAPTER 5	33
RESULTS	
CHAPTER 6	52
DISCUSSION	
CHAPTER 7	62
1. CONCLUSION	62
2. RECOMMENDATIONS	63
REFERENCE	65
APPENDICES	
1. TOPICS FOR LACTATION MANAGEMENT COURSE	69
2. BREASTFEEDING POLICY FOR NICU	72
3. BREASTFEEDING POLICY FOR OUTPATIENT CLINIC	74
4. QUESTIONNAIRE FOR MOTHERS	75
5. QUESTIONNAIRE FOR HEALTHWORKERS	81

DECLARATION

I hereby declare that the work presented in this study for the degree of Master of Medicine PAEDIATRICS, has not been presented either wholly or in part for any other degree and is not being currently submitted for any other degree.

STATEMENT

I hereby certify that this study is entirely the result of my individual effort. The various sources to which I am indebted have been acknowledged in the paper in references.

DEDICATION

TO MY HUSBAND WALERUCHI AND MY CHILDREN - CHIDI, CHINYERE, NDUKA
AND KATENDI

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SUPERVISORS: PROF. G J BHAT AND DR M SHILALUKEY NGOMA

SUMMARY

Preintervention Knowledge, Attitudes and Practices with respect to breastfeeding among Healthworkers from Neonatal Intensive Care Unit (NICU) at the University Teaching Hospital (UTH) and mothers with babies admitted to NICU was carried out.

The Healthworkers and mothers were given questionnaires to answer on Knowledge, Attitudes and Practices regarding breastfeeding. A two weeks' Lactation Management Course for the Healthworkers was conducted. After 7 weeks the same questionnaires were given to the Healthworkers and a different group of mothers whose babies were admitted in NICU during this period.

There was improvement in the Knowledge, Attitudes and Practices of Healthworkers after being trained. This improvement was reflected in the equally improved Knowledge, Attitudes and Practices of the new group of mothers who were in contact with trained Healthworkers.

NICU practices not supporting breastfeeding have been changed, mothers are now allowed in NICU to breastfeed or feed their babies expressed breastmilk by cup and spoon. No bottles are used. There is also reduced use of formula milk which is given only to those babies whose mothers are not available. Recommendations have been made regarding what should be done next.

CHAPTER 1

INTRODUCTION

Breastmilk provides ideal nutrition for newborn baby. The biological value of human milk has been established from numerous studies, some as early as the 1930's (1).

The protection rendered by breastmilk is especially essential for ill neonates and premature babies who may be immunologically incompetent(2,3). Formula milk has been associated with disastrous results in the third world countries (4). The United Nations Childrens Fund (UNICEF) estimates more than one million deaths of infants annually on account of bottle feeding. Four main dangers have been identified:

1. Those arising from non availability of protective substances of breastmilk to the infant.
2. Those arising from the contamination of the feed as a result of ignorance of simple principles of hygiene
3. Those arising from over dilution of feeds on account of cost of baby feeds.

4. Those arising from over concentration of feeds as a result of not following instructions provided by manufacturers of the formula.

The World Health Organisation (WHO) and UNICEF recommend that all babies must be exclusively breastfed for the first 4-6 months and thereafter breastfeeding must continue with appropriate supplements until the baby is 2 years old. Exclusive breastfeeding means that the baby gets only breastmilk and nothing else, not even water, glucose or traditional drinks that are routinely given to babies. No bottles or teats must be used, if a baby cannot be put on the breast, then breastmilk must be expressed and given to the baby by cup and spoon. In a situation where a mother has died after delivery or is too ill to be able to breastfeed or express milk, the baby can be given formula milk by cup and spoon rather than by bottle. The person looking after the baby must be educated on simple principles of hygiene and how to correctly reconstitute the formula milk according to the manufacturer's instructions.

Studies done in Zambia have shown that almost all mothers breastfeed their babies through the first twelve months, but very few, 13%, exclusively breastfeed(5). The rest supplement with solids and other liquids during the first three months.

The importance of breastfeeding in the control of diarrhoeal diseases has been recognised by the Control of Diarrhoeal Disease Programme (CDD) in Zambia. The curricula of CDD Training includes information on breastfeeding/diarrhoeal relationship (6).

Despite the importance attached to breastmilk, it has been observed that most of the babies admitted in the Neonatal Intensive Care Unit (NICU) at the University Teaching Hospital (UTH) are given formula milk feeds, as evidenced by the feed charts on the Unit. Out of a total daily number of 70 patients only 1% are exclusively breastfed. The rest are partially breastfed (given formula milk and breastmilk or totally formula fed - Author's observation).

Feeding babies with formula milk may have serious implications resulting in babies getting used to bottles and refusing to suck from the breast because of nipple confusion. They may go on to develop diarrhoea, malnutrition and possibly die.

A Paediatrician from the Phillipines, Natividad Relucio-Clavano, wrote in her paper that her travels throughout African and Asian countries made her see the problem of infant malnutrition in relation to bottlefeeding.

This deepened her conviction that on the issue of breastfeeding versus bottlefeeding, breast is the best. Babies deserved to be given their mother's milk, not commercial formula. She visited Zambia and had this to say, "In Zambia, it is the custom to put a child's most valuable possession on his grave. In one urban cemetery, the graves of countless babies are decorated with empty tins and bottles of commercial formula. The babies had died of malnutrition and infection, victims of what a well know American doctor had termed the immoral promotion of infant formula"(7).

Studies in many parts of the world, including the one carried out in Zambia have implicated Healthworkers as not being well informed on lactation management and therefore are not able to support, protect and promote breastfeeding (6,8,9). Some of the practices detrimental to breastfeeding include:-

1. Separating mothers and babies at birth and for most part of their stay in hospital.
2. Denying babies access to breastmilk on demand.
3. Giving prelacteal and supplementary feeds, particularly from bottles.
4. Giving free samples of formula and bottles on discharge from hospital and during follow up in under 5 clinics.

Mothers look upon Healthworkers as people who are knowledgeable and what is done in the Health Institutions to be ideal. When they see the rampant use of formula milk in these institutions, they believe this is the ideal milk for baby and upon discharge they continue with formula feeding, thereby exposing their babies to the dangers associated with such feeds.

CHAPTER 2

LITERATURE REVIEW

Breastmilk is nutritionally superior to cow's milk. It contains the ideal composition of all nutrients which change as the baby grows to suit its requirements. The first milk, colostrum, is a sticky yellowish fluid, being a high density and low volume feed. The amount secreted vary widely, ranging from 10 - 100 millilitres per day, with mean of about 30 millilitres. This secretion gradually achieves the composition of mature milk by 30 to 40 hours after delivery. It contains less lactose, fat and water soluble vitamins than mature milk. But it contains more proteins, fat soluble vitamins (Vitamin E, A, and K) and some minerals such as sodium and zinc. It is high in immunoglobins (Immunoglobulin A - Ig A) and a host of other protective factors that it could be described as nature's food (10). Before birth, nutrients are transferred from the mother to the fetus through the placenta. After birth, the same function is carried out by breastmilk(12).

Many studies have been done on the composition of human milk and its suitability for the neonate and especially preterm infants(11,12,14).

Colostrum is well matched on the specific needs of the neonates. Immature infant kidneys cannot handle large volumes of fluids without metabolic stress; the production of lactase and other gut enzymes is just beginning; anti-oxidants and quinone are needed for protection against exudative damage and hemorrhagic disease; immunoglobins (IgA) coat the immature lining of the infant's gut, preventing adherence of bacterial, viral, parasitic and other pathogens; and growth factors stimulate the infant's own systems in ways science is just beginning to understand.

Table 1 shows a list of selected anti-infective and anti-inflammatory components of human milk.

**TABLE 1: ANTI-INFECTIVE AND ANTI-INFLAMMATORY COMPONENTS
IN HUMAN MILK**

<u>MILK COMPONENT</u>	<u>FUNCTION</u>
Secretory IgA	Prevents bacterial adherence Limits antigen penetration Inhibits neutrophil chemotaxis
<u>CELLS</u>	
T Cells	Transfer of cell mediated immunity?
B Cells	Role unclear
Macrophages and Neutrophils	Phagocytosis - microbial killing

**NON-IMMUNOLOGIC ANTI-
MICROBIAL AGENTS**

Lactoferrin	Inhibits complement Inhibits bacterial growth by binding iron (Fe ³⁺)
Lysozyme	Inhibits chemotaxis and production of toxic oxygen
Lipases	Produce free fatty acids and monoglycerides which disrupt virus envelopes and lyse protozoa

ANTI-INFLAMMATORY AGENTS

Catalase	Degrades hydrogen peroxide
Alpha-tocopherol, cysteine ascorbic acid	Scavengers of oxygen radicals
Histaminase	Degrades leukotrienes
Arylsulfatase	Degrades leukotrienes
Alpha-1-antitrypsin	Neutralize enzymes that act in inflammation
Alpha-1-chemotrypsin	
Prostaglandins (E ₂ , F ₂)	Cytoprotective
90ligosaccharides	Inhibits microbial attachment

*Adapted from reference 12

Breastmilk contains hormones and growth factors whose exact functions in the newborn infant are not yet known. But studies in animals have shown that that these agents stimulate the growth of gastrointestinal tissues. Breastmilk contains a large number of enzymes. These enzymes have several roles in both mother and neonate. In the mother, their function is mainly in the lactating mammary gland in the synthesis of milk components. In the infants, they promote growth and development by providing compensatory digestive function during neonatal pancreatic insufficiency by acting as metal carriers and as anti-infective agents.

Table 2 shows the enzymes in human milk ⁽¹²⁾:

TABLE 2: ENZYMES IN HUMAN MILK THAT FUNCTION IN THE NEWBORN

ENZYME	FUNCTION
Amylase	Digestion of polysaccharide
Lipase (bile salt dependant)	Digestion of fat
Protease	Proteolysis
Xanthine oxidase	Iron, Molibdeum carrier
Glutathione peroxidase	Selenium carrier (anti-oxidant activity)
Alkaline phosphatase	Selenium carrier
Antiproteases	Protection of bioactive component enzymes, immuno-globulin, growth hormone factors

Lysozyme	Bactericidal
Peroxidase	
Catalase	Anti-infective (see table 1)

The milk produced by women who deliver prematurely differs from that of women who deliver at term. Preterm milk contains more protein during the first 4 - 7 weeks after delivery. Sodium, chloride, potassium, immunoglobulin A (IgA) are much higher during the first 3-4 weeks after delivery(12). Even from the same woman the composition of milk is different, fore milk contains less fat when compared to hind milk.

Breastmilk contains anti-allergic substances (14). Schanler looked at the composition of human and bovine milk and noted that human milk contains 30% casein and 70% whey protein. Bovine milk is casein predominant. The whey portion differs in proportion and type of protein. The major human whey protein is alpha lactalbumin, a nutritional protein in the infant and a component of mammary gland lactose synthesis. Lactoferrin, lysozyme, IgA have anti-infective properties. The major whey protein in bovine milk is beta-lactoglobulin, the protein thought to be responsible for protein allergy (13).

In one study it was demonstrated that exclusive breastfeeding during the first 4 - 6 months and delayed introduction of food in neonates with increased risk to atopy, seemed to inhibit or to retard the manifestation of atopic disease (15).

In another study, it was shown that preterm babies whose mothers provided breastmilk, a substantial advantage in subsequent Intelligence Quotient (IQ) at 7 - 8 years over, those who did not receive mother's milk. The Authors also concluded that there was a significant dose-response relation between the proportion of mother's milk consumed and later IQ(16).

Yet other studies concluded that breastmilk conferred protection against infection with *Giardia Lamblia*(17). Cunningham, Jellife and Jellife reviewed several studies on advantages of breastmilk and summarised thus: The risk of dying from lower respiratory tract infection is nearly four times higher among infants who are not breastfed in the urban environment of developing nations. Hospitalisation for respiratory tract infections (RTI) is more frequent in bottlefed infants. The middle ear cleft is a branch of the respiratory tree, so it should not be a surprise that breastfeeding protects it in the same way.

Other studies that focused primarily on epidemiology of Haemophilus influenza infection have shown that breastfeeding prevents bacteremia and meningitis. Breastfeeding's advantages are most evident through the second year.

The protection afforded by breastfeeding is greatest when bottlefeeding is excluded and the protection declines in proportion to the degree of supplementation with cow's milk or formula (18).

Breastfeeding has major impact on reducing fertility in the developing world because it leads to extended durations of amenorrhoea associated with lower rates of ovulation and conception (Huffman, 1991). Exclusive breastfeeding is 98% effective in preventing pregnancy during the first six months of life when a woman has not resumed menses.

In summary, breastfeeding protects infants against death and disease. Breastfed infants are less likely to become ill or die especially when colostrum is given and breastfeeding is exclusive for first 4 - 6 months. Breastmilk is not contaminated with bacteria and viruses that cause diarrhoeal disease and respiratory infection - the major killers of children throughout the developing world.

How breastfeeding protects babies can be explained in the following ways. It seems clear that where sanitation is poor, the microbial burden from bottle feeding is great and the resulting diarrhoeal illness is easiest to avoid when a baby is breastfed.

Human milk, when diarrhoea occurs can be used as treatment since it contains immunological components and other host defence factors that counteract the enteric and non enteric pathogens. An enteromammary circulation has been described in which antibody producing cells from the maternal intestine migrate to the breast. By this means, secretory antibodies against enteric pathogens common to the maternal-infant environment are produced in the milk and provided to the nursing baby. There is evidence of a similar system for respiratory pathogens, although how it protects the respiratory tract is not clear - coating of the pharyngeal entrance to the lower airway is one possibility. Stimulation of the infant's respiratory defenses by soluble immuno-regulatory factors in mother's milk is another(3,13,18,19,20)

Breastfeeding should be promoted as a means of enhancing birth spacing which is associated with improved nutritional status of young children.

CHAPTER 3

I. OBJECTIVE OF STUDY

MAIN OBJECTIVE - To study pre- and postintervention Knowledge, Attitudes and Practices (KAP) of staff and mothers from the NICU at UTH.

SPECIFIC OBJECTIVES

1. To determine the KAP of staff and mothers in regard to breastfeeding
2. To determine the constraints to exclusive breastfeeding in NICU neonates
3. To carry out an intervention in order to improve on the current feeding practices in the NICU, by promoting the provision of breastmilk and where mothers cannot breastfeed to give expressed breastmilk by cup and spoon
4. To carry out a postintervention study of KAP of staff and mothers from NICU

II. STUDY JUSTIFICATION

Despite the importance attached to breastmilk, it has been observed that most babies admitted to the NICU are given formula milk feeds by bottle even when mothers are available to provide breastmilk.

Breastmilk is superior to formula milk. It provides immunity against gastroenteritis, respiratory infections and it promotes maternal-infant bonding essential for normal growth and development. Besides these qualities, breastmilk has anti-allergic properties and epidermal growth factor among other things. Breastmilk has great nutritional value, does not need sterilisation, special preparation and can be given at any time. This protection is especially essential for ill neonates and premature babies who may be immunologically incompetent.

Healthworkers have been implicated as not being knowledgeable enough to educate and give support to mothers to successfully breastfeed their babies.

This study proposes to identify some of the reasons for giving neonates admitted to NICU formula. This will help in formulating interventional strategies.

CHAPTER 4

METHODOLOGY

This is a descriptive as well as quasi experimental study carried out in three parts:

PART ONE : PREINTERVENTION KAP OF NICU STAFF AND MOTHERS WITH BABIES REQUIRING INTENSIVE CARE

Assessment of preintervention KAP of NICU staff and mothers was carried out from 11th August to 11th September, 1992 in the NICU at UTH. This involved giving two questionnaires, one to the staff of NICU and the Outpatient Clinic that serves the NICU. The second questionnaire was given to the mothers whose babies were admitted in the NICU during the said period. The aim was to find out KAP of the staff and mothers in regard to breastfeeding so as to find out why babies admitted in the NICU were not provided with breastmilk. The knowledge gained was to be used for the interventional activities.

PART TWO : THE INTERVENTION

A Lactation Management Course for the staff of NICU (Zambia Enrolled Nurses, State Registered Nurses and Junior Doctors) and Outpatient Clinic (Zambia Enrolled Nurses and State Registered Nurses) was conducted from the 12th to 23rd October, 1992, about one month after Part One.

The Lectures were given by Senior members of staff of the Department of Paediatrics and Child Health and by people who had attended the San Diego Lactation Management Course in California, USA (Wellstart Associates). The Author attended this course. The Course was co-ordinated by the Author, who gave most of the Lectures. The syllabus of the course was based on the one offered The San Diego Lactation Management Programm - See Appendix 1 for the topics covered.

During the course, the participants had lectures on Lactation Management and related subjects. After 2 days, they had practical lessons for 1 - 2 hours daily which involved working with breastfeeding mothers on the NICU. They gave health education talks to mothers on the importance of breastfeeding and dangers associated with formula milk feeds especially from bottles.

Mothers were educated on how to manually express breastmilk, how to position baby for breastfeeding. Common problems encountered by breastfeeding mothers were dealt with. Special attention was given to first time mothers and mothers with multiple births. Mothers with premature babies who were not able to suck were taught how to feed expressed breastmilk by cup and spoon.

Other topics discussed with mothers were self examination of breasts for lumps, childspacing, immunization and proper weaning practices. Those with very low birth weight babies were taught about Kangaroo Mother Care and were encouraged to carry their babies in Kanagaroo style each time they came for feeds.

Participants and mothers watched the following video films:

- BREASTFEEDING - PROTECTING A NATURAL RESOURCE
- BREASTFEEDING - A SPECIAL RELATIONSHIP
- FEEDING LOW BIRTH WEIGHT BABIES
- KANGAROO MOTHER CARE

Breastfeeding and diarrhoeal disease control and how to help working mothers successfully breastfeed were discussed. See Appendix 1 for topics covered.

At the end of the course, the participants were helped to formulate Breastfeeding Policies for their respective places of work in line with UNICEF's "TEN STEPS TO SUCCESSFUL BREASTFEEDING" but with modifications to suit their area of work (NICU or Outpatient Clinic). See Appendix 2,3.

PART THREE : POSTINTERVENTION

About seven weeks after the Lactation Management Course, 14th December, 1992 to 14th January 1993, the same questionnaires used in Part One were given to the staff of NICU and Outpatient Clinic. The second questionnaire for mothers, was to given to a new group of mothers whose babies were admitted in the NICU during this period.

STUDY SITE

The NICU is situated on the first floor of D Block in the UTH. The Block also has an Outpatient Clinic, Paediatric Surgical Theatre and Ward. There is a Laboratory, X Ray, Ultrasonography and Electrocardiography Section. The NICU admits between 250 - 350 patients per month on average. The breakdown of cases admitted is as follows:-

Prematurity	50 -60%
Birth Asphyxia	20%
Observation	15%
Infection and Anomalies	5%

There are 100 Cot/Incubators with 24 Incubators in the three intensive care rooms, D11-1, D11-2, D11-3. In D11-1 are admitted only those babies delivered in UTH Labour ward and Theatre. These are later transferred to D11-2 if they still need intensive care to make room for new admissions in D11-1.

In D11-3 are admitted those babies born at home and in the Peripheral Clinics. On the opposite side are wards D12-1 for stable premature babies who have not yet gained enough weight for discharge. D12-2 is for stable babies with weight over 2000 grams, awaiting to be collected after being discharged and those who have a few days to complete treatment before being discharged. In between these wards at one end is ward D14, the isolation, where babies with various infections are admitted. In the middle of the Unit is the Nurses' Post, Sister in charge's desk and a hall used for various purposes (students' tutorials, meetings etc). Procedures like bilirubin and blood sugar estimation are done in this same hall. There is a Blood Gas machine installed in the same place. The Unit has its own ultrasonography machine and a portable X Ray Machine.

The following are amongst the criteria for admission to the

Unit:- Prematurity

Birth asphyxia

Large and small for gestationa age

Congenital anomalies

Neonatal jaundice

Infections

Face presentation

Observation babies

"Observation babies" are usually those that are delivered by ceasarian section, forceps or vacuum extraction delivery, big babies with birth weight of over 4.5Kg and babies whose mothers are Rhesus negative or Diabetic. These babies are observed for a period of 24 - 48 hours after which they are discharged is they are found to have no problems.

All babies admitted to NICU are given glucose water as the first feed if the condition permits oral feeds. The next feed after three hours is usually formula milk which like the glucose feed is given by bottle. Babies are fed at three hourly intervals. Mothers usually come to the NICU at 3 hourly intervals starting from 0600 hours up to midnight. After that the nurses feed the babies who become hungry with formula milk from bottles or nasogastric tube at 0300 hours.

Mothers are accommodated in the Mother's Shelter upon discharge from the postnatal wards. There is no direct communication between the Mothers' Shelter and the NICU. The mothers have to walk in the open to come to the NICU to provide breastmilk for their babies. This makes most of them to miss coming to the Unit, especially at night.

Those mothers who are yet to be discharged from the postnatal wards and those who deliver by caesarian section come from the various wards to the Unit. There are four postnatal wards. Two on the ground floor and two on the first floor in the B and C Blocks of the hospital. The distance from these wards to NICU is 200 to 250 metres.

The only mothers allowed to enter the NICU to breastfeed are those whose babies are admitted in the isolation ward (babies with various infections). Mothers with babies in the Intensive Care Wards and those with stable preterm babies who have not yet attained adequate weight for discharge are not allowed to enter the Unit. They only see their babies through the viewing windows on either side of the Unit. These mothers usually come about 30 minutes earlier than the others to express breastmilk which is then given to their babies by nurses. The milk is given by bottle or gavage depending on the condition of the baby.

Babies weighing over 2000 grams who are stable are given to their mothers to breastfeed in the breastfeeding room attached to the Unit. In case a mother fails to turn up during feeding time or comes late, her baby is given formula milk. Even when a mother shows up late with expressed breastmilk, it is discarded if her baby has already received formula feed.

No expressed breastmilk is stored. If a baby is unable to finish the amount expressed by its mother, the remaining milk is discarded. The Unit uses an average of 5 x 500 grams tins of formula milk per day. Whichever baby formula is available on the market is used, usually "S26" or "Lactogen". Mothers are not allowed in the Unit because it is feared they might be a source of infection.

There is no written Policy on Breastfeeding in either the NICU or Outpatient Clinic. Staff usually receive verbal briefings from the sister in charge or other colleagues who have been on the Unit much longer.

STUDY POPULATION

All mothers whose babies were admitted in the NICU during the period of study were included. If a mother was not well enough to come to NICU then she was interviewed in the postnatal ward where she was admitted. Mothers admitted in the Intensive Care Unit were excluded.

All nurses and doctors who were on duty in the NICU and Outpatient Clinic during the period the study was being conducted were interviewed. These included doctors from the general paediatric wards who were doing night call duties in the NICU during the study period in the preintervention period.

STUDY DESIGN

This was a descriptive and well as quasi experimental study.

DATA COLLECTION

The data was collected on two questionnaires which were obtained from Dr Paul Freund, Pritech Representative in Zambia. The questionnaires were modified to suit mothers and staff of NICU.

The questionnaires were designed to assess the KAP of Healthworkers and mothers regarding breastfeeding and were tested between 15 - 31 July 1992.

Interviews were conducted by the Author and 4 State Registered Nurses as Research Assistants who had received prior briefing on objectives and research methodology.

The information collected was entered in a computer and analysed using software EPI INFO.

Only those questions that addressed the KAP of staff (Healthworkers) and mothers were analysed. In the Healthworkers' questionnaires general questions about speciality, area of work and duration of work in the said section were analysed. For mothers, parity, antenatal clinic attendance, clinic attended and number of times attended were looked at.

CHAPTER 5

RESULTS

HEALTH WORKERS INTERVIEWS

A total of 38 Health Workers (HW) were interviewed during the preintervention period. These included 30 nurses and 8 doctors. Three were Junior Doctors posted to the NICU during the period of study, the other 5 were from General Paediatric wards and were doing an average of twice a week 16 hours call duties in NICU.

During the Lactation Management training, 34 Nurses and one doctor were trained. None of the Doctors in the preintervention group took part in the training since they had moved to other Departments. The 5 from General Paediatrics were no longer doing calls in NICU and those recently posted for calls to NICU could not be released for the course due to staff shortage. Two new doctors had recently been posted to NICU. One of them attended the Lactation Management training while the other remained to man the ward together with the Senior Registrar and the Consultant in Charge. The Author is a Registrar in the NICU and was co-ordinator of the training.

Out of a total 35 HWS trained (34 nurses and 1 doctor), 7 nurses did not participate in the Postintervention since they had either been transferred to other departments (3) and 4 were on leave.

Thirty-one (31) HW participated in the Postintervention, 29 nurses and 2 doctors working in NICU. Out of these one doctor (who had been left to man the ward) and 3 nurses were not involvement in the training. The 3 nurses were recently posted to NICU.

The duration of work in NICU ranged from 3 days to 15 years, with an average of 3 years in both pre-and postintervention groups.

I. LACTATION MANAGEMENT

Health Workers were asked if there had recently read about Lactation Management. In the preintervention period 17 (45%) said they had read about Lactation Management, while 55% had not. Of the 17 who had read about Lactation Management, 15 (88%) had done so from medical textbooks and 2 (12%) from professional journals.

In the Postintervention 30 (97%) had read about Lactation Management and 1 (3%) had not. Of the 30 who had read; 28 (93%) did so from lectures and handouts given during the Lactation Training.

II. BREASTFEEDING PRACTICES

TABLE I: TIMING

The table below shows what the Hws felt was ideal timing of the first breastfeed after delivery.

TIME	PREINTERVENTION	POSTINTERVENTION
At Birth	14 (37%)	29 (94%)
1 - 3 Hours	11 (29%)	1 (3%)
4 - 6 Hours	7 (18%)	1 (3%)
7 - 12 Hours	3 (8%)	
When Demanded	3 (8%)	
TOTAL	38 (100%)	31 (100%)

TABLE II: FREQUENCY OF BREASTFEEDING A NORMAL 3.5 KG BABAY

Hws were asked how often a normal, 3.5 Kg baby should breastfeed.

FREQUENCY	PREINTERVENTION	POSTINTERVENTION
1 - 2 Hours	6 (16%)	
3 - 4 Hours	4 (10%)	
On Demand but at least 3 Hrly intervals	28 (74%)	31 (100%)
TOTAL	38 (100%)	31 (100%)

TABLE III: PRELACTEAL FEEDS

Recommended feed before mother's milk comes in.

FEED	PREINTERVENTION	POSTINTERVENTION
Glucose/formula	33 (92%)	11 (35%)
Nothing	3 (8%)	20 (65%)
TOTAL	36 (100%)	31 (100%)

$P < 0.000004$

TABLE IV: ALLOW MOTHERS TO ENTER NICU

	PREINTERVENTION	POSTINTERVENTION
YES	25 (68%)	31 (100%)
NO	12 (32%)	0
TOTAL	37 (100%)	31 (100%)

$P < 0.0014$

TABLE V: FIRST FEED TO NICU BABIES

TYPE OF FEED	PREINTERVENTION	POSTINTERVENTION
Glucose + Water	36 (97%)	2 (6%)
Formula	1 (3%)	29 (94%)
TOTAL	37 (100%)	31 (100%)

TABLE VI:

HW were asked what advise they would give a mother intending to bottlefeed her baby from birth. They gave the following answers:-

ADVISE	PREINTERVENTION	POSTINTERVENTION
Advise against	32 (84%)	29 (97%)
Advise her to bottlefeed if she can afford	2 (5%)	-
Allow her to make her own decision	4 (11%)	1 (3%)
TOTAL	38 (100%)	30 (100%)

TABLE VII

It was established that at UTH, normal babies are locked up in nurseries for security at all times. Mothers are allowed in at 3 hourly intervals to feed their babies. HW were than asked if they favoured such an arrangement. They gave the following answers:-

	PREINTERVENTION	POSTINTERVENTION
Mother and baby separate at all times	17 (45%)	-
Together at all times, day or night	21 (55%)	31 (100%)
TOTAL	38 (100%)	31 (100%)

TABLE VIII: HOW TO IMPROVE BREASTMILK PRODUCTION

HW said they would advise mothers in the following ways o improve their milk production:-

	PREINTERVENTION	POSTINTERVENTION
Breastfeed more often and good diet	17 (45%)	30 (97%)
Drink more fluids	21 (55%)	1 (3%)
TOTAL	38 (100%)	31 (100%)

P < 0.00001

ANTENATAL ADVICE

HW were asked what they thought nurses in Antenatal Clinic should discuss with a pregnant woman or what they should look for in a pregnant woman. In both pre- and post-intervention HWs were of the opinion that nurses should:-

1. Inform mothers about benefits and management of breastfeeding.
2. Check mothers' breasts for potential breastfeeding problems.
3. Find out previous breastfeeding history.

TABLE IX: ADVISE TO A WORKING MOTHER

If a mother had to return to work within 2 months of delivery, what would be the best milk for the baby and what feeding utensil should be used?

TYPE OF MILK	PREINTERVENTION	POSTINTERVENTION
Expressed Breast milk	27 (71%)	30 (97%)
Formula milk	11 (29%)	1 (3%)
TOTAL	38 (100%)	31 (100%)

TABLE X:

FEEDING UTENSIL	PREINTERVENTION	POSTINTERVENTION
Bottle	24 (63%)	1 (3%)
Cup and spoon	14 (37%)	30 (97%)
TOTAL	38 (100%)	31 (100%)

TABLE XI: PRACTICE OF GIVING FORMULA

It was established that formula milk was being used for the following babies:

- babies in NICU,
- sick babies,
- abandoned babies and
- babies whose mothers had died.

How were asked for which group of babies did they think formula milk should be used for:-

BABIES WHO SHOULD RECEIVE FORMULA MILK	PREINTERVENTION	POSTINTERVENTION
Abandoned/babies of dead or very ill mothers	23 (60%)	29 (94%)
Mother does not have enough milk	15 (40%)	2 (6%)
TOTAL	38 (100%)	31 (100%)

TABLE XII: AGE OF INTRODUCING OTHER FOOD/DRINK IN BABIES DIET

HW were asked at what age other foods/drinks should be introduced in a baby's diet.

AGE	WATER		FRUIT JUICE		CEREALS		GLUCOSE	
	PRE-	POST-	PRE-	POST-	PRE-	POST-	PRE-	POST-
1 - 2 days	12 (39%)	3 (11%)					28 (85%)	5 (30%)
3 - 4 days								
5 - 6 days								
1 week	1 (3%)						1 (3%)	
2 weeks	2 (7%)							
3 weeks			2 (6%)					
1 - 3 months	2 (7%)	1 (4%)	12 (34%)	4 (79%)	12 (34%)	2 (7%)	2 (7%)	
1 - 6 months	10 (32%)	24 (86%)	15 (43%)	25 (87%)	24 (64%)	26 (88%)	2 (7%)	10 (59%)

BREASTFEEDING POLICY

HW were asked if there was a written Policy on breastfeeding in their place of work. In preintervention 3 (9%) said yes, there was a written Policy even though this could not be seen on display; 32 (91%) said there was no Policy.

In postintervention 27 (90%) agreed there was a Policy and it was visibly displayed. However, 3 (10%) were not aware of the Policy.

MOTHERS INTERVIEWS

A total of 159 mothers in preintervention period and 141 in postintervention were interviewed. They came from the same social background judging by the similar antenatal clinics that they attended.

Only 7 (4%) in the preintervention group and 9 (6%) in the postintervention group attended the UTK Antenatal Clinic. The rest in both groups attended the periurban clinics around Lusaka, while a few came from clinics in other provinces.

ANTENATAL CLINIC ATTENDANCE

154 (97%) mothers in preintervention group had attended antenatal clinic (ANC). Of these only 37 (24%) received advise on infant feeding while the rest, 117 (79%) did not get any advise.

In the postintervention group 139 (99%) attended ANC while 2 (1%) did not. Out of those who attended ANC, only 35 (25%) received advise on infant feeding while 103 (75%) did not get any advise.

TABLE I:

	PREINTERVENTION	POSTINTERVENTION
Attended	154 (94%)	139 (99%)
Not attended	5 (6%)	2 (1%)
TOTAL	159 (100%)	141 (100%)

TABLE II: ADVISE ON FEEDING

	PREINTERVENTION	POSTINTERVENTION
Received	37 (24%)	35 (25%)
Not received	117 (76%)	103 (75%)
TOTAL	154 (100%)	138 (100%)

TABLE III: ADVISE GIVEN

The Table below shows the type of advice given to those mothers who had received feeding information during antenatal attendance.

	PREINTERVENTION	POSTINTERVENTION
Breastfeeding + other milk	27 (73%)	18 (51%)
Only Breast-feeding	10 (27%)	17 (49%)
TOTAL	37 (100%)	35 (100%)

EXCLUSIVE BREASTFEEDING

Mothers were asked if they knew up to what age a baby will remain healthy on breastmilk alone.

In the Preintervention group 109 (70%) said yes they knew, while 47 (30%) did not. In Postintervention 128 (91%) said yes and 13 (9%) did not know.

TABLE IV: The Table below shows the response of those who said they knew up to what age a baby will remain healthy on breast milk alone.

AGE BABY WILL REMAIN HEALTHY ON BREAST MILK ONLY	PREINTERVENTION	POSTINTERVENTION
1 - 3 Months	60 (54%)	22 (17%)
4 - 6 Months	43 (39%)	100 (79%)
7 - 12 Months	3 (3%)	5 (4%)
13 - 24 Months	4 (4%)	-
TOTAL	110 (100%)	127 (100%)

TABLE V: INTENTION TO GIVE OTHER MILK

	PREINTERVENTION	POSTINTERVENTION
YES	95 (62%)	18 (13%)
NO	59 (38%)	122 (87%)
TOTAL	154 (100%)	144 (100%)

$P < 0.0001$

In the Preintervention group 109 (70%) said yes they knew, while 47 (30%) did not. In Postintervention 128 (91%) said yes and 13 (9%) did not know.

TABLE IV: The Table below shows the response of those who said they knew up to what age a baby will remain healthy on breast milk alone.

AGE BABY WILL REMAIN HEALTHY ON BREAST MILK ONLY	PREINTERVENTION	POSTINTERVENTION
1 - 3 Months	60 (54%)	22 (17%)
4 - 6 Months	43 (39%)	100 (79%)
7 - 12 Months	3 (3%)	5 (4%)
13 - 24 Months	4 (4%)	-
TOTAL	110 (100%)	127 (100%)

TABLE V: INTENTION TO GIVE OTHER MILK

	PREINTERVENTION	POSTINTERVENTION
YES	95 (62%)	18 (13%)
NO	59 (38%)	122 (87%)
TOTAL	154 (100%)	144 (100%)

P < 0.0001

TABLE VI: INTENTION TO GIVE WATER/GLUCOSE

Mothers were asked if they intended to give water or glucose before baby reaches the age of four months.

	PREINTERVENTION	POSTINTERVENTION
YES	134 (87%)	58 (41%)
NO	20 (13%)	82 (59%)
TOTAL	154 (100%)	140 (100%)

P < 0.0001

TABLE VII: WHY BABY IS ADMITTED IN NICU

Mothers were asked if they knew why their babies were admitted in NICU.

TOLD REASON FOR ADMISSION	PREINTERVENTION	POSTINTERVENTION
YES	138 (88%)	130 (92%)
NO	19 (12%)	11 (8%)
TOTAL	157 (100%)	141 (100%)

P < 0.21

TABLE VIII: PROVISION OF FEEDING INFORMATION

Mothers were asked if they had been given any feeding information. If yes, who gave this information.

INFORMATION GIVEN	PREINTERVENTION	POSTINTERVENTION
YES	138 (88%)	120 (85%)
NO	19 (12%)	21 (15%)
TOTAL	157 (100%)	141 (100%)

P < 0.48

TABLE IX: PROVISION OF FEEDING INFORMATION

Mothers were asked if they had been given any feeding information. If yes, who gave this information.

INFORMATION GIVEN	PREINTERVENTION	POSTINTERVENTION
NO	77 (49 %)	8 (6%)
YES	79 (51%)	133 (94%)
TOTAL	156 (100%)	141 (100%)

P < 0.001

TABLE X: WHO GAVE INFORMATION

WHO GAVE INFORMATION	PREINTERVENTION	POSTINTERVENTION
STAFF (Doctor/Nurse)	55 (70%)	108 (81%)
Other Mothers	24 (30%)	25 (19%)
TOTAL	79 (100%)	133 (100%)

P < 0.053

TABLE XI: WHAT INFORMATION WAS GIVEN

INFORMATION GIVEN	PREINTERVENTION	POSTINTERVENTION
Breastfeed	45 (39%)	96 (70%)
Express Breastmilk	68 (61%)	41 (30%)
TOTAL	113 (100%)	137 (100%)

P < 0.00001

TABLE XII: THE FIRST FEED

Mothers were asked when they started expressing breastmilk/
breastfeeding their babies who are admitted in NICU.

WHEN BABY FIRST GOT MOTHER'S MILK	PREINTERVENTION	POSTINTERVENTION
1 - 3 Hours	6 (4%)	20 (14%)
4 - 6 Hours	0 (0%)	5 (3%)
7 - 9 Hours	0 (0%)	5 (3%)
1 day	54 (36%)	62 (44%)
2 days	34 (23%)	27 (19%)
3 days	26 (17%)	10 (7%)
4 days	13 (7%)	10 (7%)
> 4 days	17 (11%)	2 (100%)
TOTAL	150 (100%)	141 (100%)

**TABLE XIII: REASON FOR LATE INITIATION OF BREASTFEEDING/
EXPRESSING BREAST MILK**

REASON	PREINTERVENTION	POSTINTERVENTION
Was not told to breastfeed /Express milk	55 (41%)	67 (60%)
Feeling tired /Unwell	79 (59%)	44 (40%)
TOTAL	134 (100%)	111 (100%)

P < 0.0026

IMPROVING MILK PRODUCTION

Sixty percent of mothers in preintervention group said they drink a lot of fluids (tea with milk or milk) to increase the breastmilk supply. Twenty-three percent drink chibuku (Opaque beer brewed from maize and malt) or munkoyo (brewed from maize meal and fermented with some roots) to increase their milk supply, while twelve percent eat a lot of fruit and vegetables.

In Postintervention 53% drink a lot of fluids, 13% munkoyo or chibuku and 2% eat lots of fruit and vegetable.

MANUAL EXPRESSION OF BREAST MILK

Mothers were asked if they had been instructed on how to manually express breastmilk. If yes, by who?

TABLE XIV: INSTRUCTION ON MANUAL EXPRESSION

RECEIVED INSTRUCTION	PREINTERVENTION	POSTINTERVENTION
NO	100 (71%)	8 (6%)
YES	40 (29%)	133 (94%)
TOTAL	140 (100%)	141 (100%)

P < 0.001

TABLE XV: WHO GAVE INSTRUCTIONS ON MANUAL EXPRESSION?

WHO GAVE INSTRUCTIONS	PREINTERVENTION	POSTINTERVENTION
NICU Nurses	22 (47%)	62 (73%)
OTHERS	25 (53%)	23 (27%)
TOTAL	47 (100%)	85 (100%)

P < 0.05

TABLE XVI: MOTHERS WERE ASKED IF THEY WERE HAVING DIFFICULTIES IN EXPRESSING MILK

HAVING DIFFICULTY	PREINTERVENTION	POSTINTERVENTION
NO	30 (33%)	44 (73%)
YES	60 (67%)	16 (27%)
TOTAL	90 (100%)	60 (100%)

P < 0.00001

TABLE XVII: WHAT DIFFICULTY WAS ENCOUNTERED

WHAT DIFFICULTY	PREINTERVENTION	POSTINTERVENTION
No milk comes out	14 (21%)	3 (19%)
A little milk come out	18 (74%)	11 (69%)
Painful Breast	3 (5%)	2 (12%)
TOTAL	35 (100%)	16 (100%)

TABLE XVIII: WEANING PRACTICES

Mothers were asked at what age they intended to introduce weaning diet.

AGE	PREINTERVENTION	POSTINTERVENTION
1 - 3 Months	72 (46%)	18 (13%)
4 - 6 Months	64 (41%)	107 (76%)
More than 6 months	19 (13%)	16 (11%)
TOTAL	155 (100%)	142 (100%)

TABLE XIX:

Mothers were asked why their babies were being given formula milk when they were available to provide breastmilk.

REASON	PREINTERVENTION	POSTINTERVENTION
Mother Unwell	35 (23%)	11 (8%)
Mother not lactating enough (does not have enough milk)	68 (46%)	3 (2%)
Not lactating yet	25 (17%)	6 (4%)
Baby only has feed at 03.00 hours when mothers are not expected to go to NICU	21 (14%)	116 (86%)
TOTAL	149 (100%)	136 (100%)

TABLE XX: LENGTH OF BREASTFEEDING

Asked how long they intended to breastfeed their babies, mothers responded thus:-

AGE	PREINTERVENTION	POSTINTERVENTION
< 1 YEAR	2 (1%)	12 (9%)
1 - 2 YEARS	87 (56%)	123 (87%)
> 2 YEARS	66 (48%)	6 (4%)
TOTAL	155 (100%)	141 (100%)

CHAPTER 6

DISCUSSION

PREINTERVENTION

The knowledge of HW in the preintervention period was generally good, but they lacked knowledge in key areas. These areas are:

- | When to initiate breastfeeding.
- | Exclusive breastfeeding.
- | How to improve and maintain lactation.

The pitfalls in these key areas were well demonstrated when one looked at the mothers' answers on the above mentioned topics during preintervention period.

Hospital practices and specifically in the NICU do not support breastfeeding. Babies are kept separate from their mothers all the time. Mothers are not allowed in the NICU as part of infection control strategy.

It is well known that for breastfeeding to be successful, education should start long before a woman even thinks of getting pregnant. Successful breastfeeding not only depends upon a willing mother, healthy infant and encouragement by medical personnel but also on the knowledge and attitudes developed during adolescence ⁽²²⁾.

In this study more than 80% of the mothers attended ANC but only 25% of those who attended ANC received any information on infant feeding. Even where such information was given, it was not wholly on breastfeeding. Mothers were advised to give formula if needed and early supplementation with semi-solids like porridge. Some mothers were advised to give formula if they could afford it.

Educating mothers is only possible if HW are knowledgeable in all aspects of Lactation Management. This way they can be able to give correct information and be in a position to help mothers in case of problems associated with breastfeeding.

Early contact between mother and infant, as well as early initiation of breastfeeding is important for successful and prolonged breastfeeding. Babies allowed early contact with their mothers as soon after birth as possible have been found to start suckling earlier than those not allowed contact. Early suckling pattern has prognostic value for the duration and success of breastfeeding ^(26,29,30). This is also important for establishing maternal-infant bonding which is very important for normal growth and development.

In this study it has been established that there is late initiation of breastfeeding and indeed contact between mothers and their babies. This is because these babies are usually born with one problem or the other requiring them to be transferred soon after birth to NICU. The mothers are not allowed in the NICU, and it takes up to 5 days for some mothers to start breastfeeding/expressing breastmilk for their babies. Even normal babies delivered at UTH are kept separate from their mothers day and night, except during feeds. The knowledge of HW on initiation of breastfeeding in this study is similar to that shown in a similar studies by Freund ⁽⁶⁾ and Breastfeeding Promotion in Kenya ⁽³¹⁾.

Most people believe that breastfeeding is not a problem in Zambia judging by the number of women seen breastfeeding. This is confirmed by studies carried out in Zambia ^(5,6), and Goma (1983) and indeed in this study - more than 80% of mothers breastfeed their babies well over one year of age. But the real problem is exclusive breastfeeding - only 13% mothers exclusively breastfeed ⁽⁵⁾. Mothers believe that babies need water especially in hot weather. This is contrary to studies done in countries with very hot climate ⁽²⁸⁾.

Some other mothers believe that their breastmilk alone is not enough for the baby and hence supplement with formula or even introduce porridge within 1-3 months as shown in this study (47%). Hospital practices of using formula do not help matters either. In this study, 62% mothers plan to give other milk, and 87% will give water or glucose before 4 months. Freund had similar results with 81% planning to give water or glucose.

HWs in this study would advise mothers to give water (39% and glucose (80%) from birth. Freund had similar results too. There is routine use of glucose water as first feed for all NICU admissions as shown in this study. This should be discouraged unless there is a medical indication e.g. infants of diabetic mothers who usually present with hypoglycemia.

In this study, most HWs were not in favour of allowing mothers to enter the NICU. Some of the reasons given were that they would be a source of infection and also that they would disturb the staff. Mothers need a lot of support from HW so as to initiate and consequently breastfeed successfully. Manual expression of breastmilk has to be done properly. Fingers not positioned correctly on the breast will result in little or no milk coming out ^(23,24,25).

In this study, 71% mothers did not receive any instructions on manual expression of breastmilk. This resulted in 60% of them having difficulties ranging from not having enough milk or no milk coming out at all to painful and sore breasts. Breastmilk production is increased and maintained by frequent suckling of the baby or emptying of the breast by expressing the milk.

Drinking a lot of fluids per se does not directly lead to increased milk supply. Mothers should be advised to drink to quench thirst. A well balanced diet is important in improving the quality but not quantity of breastmilk produced and sustain the mother's health.

In the study both HWS and mothers were of the opinion that drinking a lot of fluids would lead to increased breastmilk production. Other mothers thought local brews, munkoyo and chibuku had similar effects.

It is not known whether chibuku and munkoyo are galactagogues - studies need to be done to prove or disprove this. Freund's study had similar results. The more the breast is emptied, the more milk it will produce. When the breast is full of milk, there is a negative feedback mechanism in place which prevents more milk being produced ⁽³²⁾.

Working mothers are a special group who need the support of HWs. In Zambia, like many other countries, only 90 days are given for Maternity Leave. By the time a mother is returning to work, her baby is just about 2 months old or even less. The mother should be educated on how to express milk manually and this can be given to the baby by cup and spoon in the mother's absence. If the mother is away for longer periods and is not able to express enough milk for the baby, this is the one time that formula milk could be used but it has to be offered by cup and spoon rather than by bottle. In this study, 57% HWs recommended bottle feeding for a baby whose mother has to go back to work. Freund had similar finding (55%).

Mothers who deliver prematurely and those whose babies need intensive care immediately after birth are another group who need the sympathy and support of HWs.

Establishing lactation is a problem for these mothers, they feel inadequate for not delivering at term, the separation and many machines in the modern NICUs and ever so busy staff is stressful. All these contribute to a negative effect on their milk production. HWs can do a lot to help these mothers if they are knowledgeable about Lactation Management.

These are mothers who should be taught manual expression of breastmilk, allowed in to touch their babies and be shown how to carry their babies Kangaroo Mother Style as soon as the condition of the baby permits ^(27,34).

Mothers with twins also need help. They have to be reassured that they are able to produce enough milk for the two babies. The more the breasts are emptied, the more milk they will produce. However, such a mother needs to be well counselled on the importance of increased calorie intake and a well balanced diet. She has to be taught how to position both babies for simultaneous feeding or if she prefers, she can feed one baby at a time ⁽³⁵⁾.

POSTINTERVENTION

The findings in the preintervention - inadequate knowledge of HWs in some key areas, hospital and specifically NICU practices which do not support breastfeeding (routine use of glucose as first feed, not allowing mothers in NICU, giving formula to babies whose mothers are available) with resultant poor KAP of mothers pointed to the need to educate HWs on Lactation Management so that they in turn help mothers to successfully breastfeed their babies.

Studies by Freund in Zambia and Bradley et al in Kenya ^(6,13) had similar conclusions and recommended training of HWs. These efforts have likely contributed to the increase in breastfeeding duration which has been observed in Kenya ⁽³¹⁾.

In our study there was significant improvement in the KAP of HWs in postintervention period. HWs knowledge and attitudes had improved in those areas of earlier concern. 94% advocate initiation of breastfeeding at birth. The NICU being located away from where the mothers are accommodated is a hinderance. HWs in the postnatal wards have not yet received training in Lactation Management and do not always give the best possible support and advice to mothers.

Moreover they, themselves, keep mothers and babies separated all the times, in the nurseries. The result is that, we see mothers initiating breast feeding as late as 5 days.

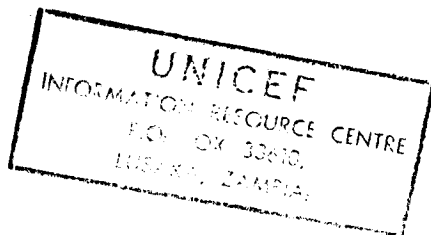
However, one limitation in this study is that the duration of contact between HWs and mothers before being interviewed was not looked at. Hence some mothers were interviewed on the first day that they came to NICU and therefore, did not benefit from HWs improved knowledge. This has affected the postintervention response in some mothers.

There is more interaction between mothers and HWs in postintervention period. 94% of mothers were given feeding information compared to 51% in the preintervention. There is a significant improvement in the area of interaction between HWs and mothers ($P < 0.001$). 81% have been given infant feeding information by HWs. The information given to them is either to breastfeed or to express breastmilk with no mothers being advised to give formula.

Seventy-three (73%) mothers got instructions on how to express breastmilk manually by the nurses. Mothers are now being allowed in the NICU during feeding times and are being taught how to feed by cup and spoon. The hallmark of the improved practices is the doing away with feeding bottles which had been associated with increased infection.

Using feeding bottles also causes nipple confusion for the baby, they tend to prefer teats to breast nipple where much effort is required for milk to come out.

More mothers, 79% compared to 39% in the preintervention know that babies will remain healthy on breast milk alone up to 4-6 months and they do not need water and glucose before the age of 4 months.



There is a significant increase in mothers wishing to exclusively breastfeed during the first 4-6 months ($P < 0.001$).

However, the use of formula cannot completely be done away with since it takes time (few hours to days) before some mothers actually come to the Unit to provide milk. When formula has to be used, it should be given by cup and spoon. As soon as the mother starts coming to the Unit, the baby should not be given formula. The routine use of glucose water as first feed has been done away with. Babies are given formula milk until mothers start proving breastmilk.

Babies are alright with 3 hourly feeds until midnight. Most mothers (85%), once they start, continue coming to the Unit until midnight. Their babies get fed on formula milk at 03.00 hours if they are hungry. Babies do not actually need this feed, but should it be necessary, then it is better to get mothers to express milk after the midnight feed and leave it for the nurses to feed the baby by cup. Exclusively breastfeeding these babies will enable them get maximum protection from breast milk ⁽¹⁸⁾.

CHAPTER 7

CONCLUSION

I. PREINTERVENTION:-

Existing KAP among mothers and HWs do not encourage

- a) Early Initiation of breast feeding at birth.
- b) Infant-maternal bonding.
- c) Not support frequent feeding.
- d) Exclusive breast feeding.
- e) Proper weaning practices.

II. INTERVENTION

Inservice training improves knowledge and practices in:-

- a) Initiation of breast feeding.
- b) Facilitating maternal-infant bonding
- c) Frequency of feeding.
- d) Exclusive breastfeeding.
- e) Proper weaning practices.

III. BREASTFEEDING POLICY

Breastfeeding Policy introduced on NICU and DOPD:
available and accessible.

RECOMMENDATIONS

Breastfeeding is an important child survival strategy. HWs need to be conversant with all aspects of Lactation Management so as to give support to mothers.

1. Education should start with adolescent girls ⁽²⁶⁾, continued in Antenatal Clinics ^(23, 24, 25) and reinforced after delivery and continued during Under-5 Clinic attendance.
2. There is need for continued training of HWs in view of frequent staff changes (Transfer to other departments).
3. All staff in Maternal and Child Health institutions should be trained in Lactation Management.
4. National Policy on breast feeding should be formulated. All Health Units should formulate their Policies in line with National Policy on Breastfeeding which should be discussed with all staff and later displayed.
5. The concept of Kangaroo Mother Care should be incorporated in Neonatal Care, especially where incubators are not easy to come by or not enough.

6. There should be regular evaluation of the effectiveness/impact of breast feeding which can be used in other Units to convince other HWs on the advantages of promoting and supporting breast feeding. A study should be done in the NICU to evaluate the impact of this study on neonatal infections.
7. Regular training of paediatric and maternity staff, stressing on the key areas:
 - Early initiation,
 - Continued mother-infant contact,
 - Rooming-in,
 - Exclusive breastfeeding for the first 4 - 6 months and Continued breastfeeding thereafter with appropriate Supplements up to 2 years.
 - Breastfeeding as a contraceptive method.
 - Breastfeeding in the control of acute diarrhoeal diseases and acute respiratory infection.
8. Infant formula to be used only for :
 - Abandoned babies and
 - Babies of very sick or dead mothers.
 - In NICU before mothers are available

This should be given by cup and spoon. those looking after such babies should be taught simple rules of hygiene and how to reconstitute the formula properly.
9. Breastfeeding IEC materials to be produced and disseminated to HWs and mothers (leaflets, pamphlets and posters).

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APPENDIX I

TOPICS FOR LACTATION MANAGEMENT COURSE

- | PRETEST.
- | OVERVIEW OF BREAST FEEDING AND CHILD SURVIVAL (DR. PANDEY).
- | ANATOMY OF THE BREAST. PHYSIOLOGY OF LACTATION. ANATOMICAL VARIATIONS OF THE MAMMARY GLAND (DR. PANDEY)
- | MANAGEMENT OF SUCCESSFUL BREASTFEEDING. NEONATAL TRANSITION PERIOD (DR. AMADI).
- | MATERNAL NUTRITION (DR. KAVINDELE).
- | VIDEO FILM - BREASTFEEDING, PROTECTING A NATURAL RESOURCE.
- | PROBLEMS IMPAIRING SUCCESSFUL BREAST FEEDING (DR. AMADI).
- | FEEDING LOW BIRTH WEIGHT INFANTS (DR. AMADI)
- | VIDEO FILM: FEEDING LOW BIRTH WEIGHT INFANTS.
- | KANGAROO MOTHER CARE (DR. AMADI).
- | VIDEO FILM: KANGAROO MOTHER CARE.
- | MATERNAL TO INFANT BIOCHEMICAL AND IMMUNOLOGICAL TRANSFER THROUGH BREAST MILK. BREASTFEEDING AND HIV/AIDS (DR. AMADI).
- | RELUCTANT NURSERY TECHNIQUES.
- | MAINTAINING LACTATION DURING SEPARATION MANUAL EXPRESSION OF BREAST MILK (MRS. MBELENGA).

IMMUNIZATION (DR. NGOMA).

HELPING MOTHERS TO EXPRESS BREAST MILK MANUALLY (MRS MBELENGA, MRS. MZUMARA, MRS. MUNSAKA).

MOTHER-INFANT COUPLE - HISTORY TAKING AND INTERPRETATION.

MANUAL EXPRESSION OF BREAST MILK (DR. AMADI).

INSUFFICIENT BREASTMILK SYNDROME (DR. NGOMA).

WEANING GUIDANCE (MRS. MBELENGA).

WORKING WITH MOTHERS - POSITIONING AT THE BREAST.

FERTILITY AND CHILD SPACING (MRS. MZUMARA).

VIDEO FILM: EXAMINATION OF THE BREAST.

VIDEO FILM: BREASTFEEDING; A SPECIAL RELATIONSHIP.

WORKING WITH MOTHERS - EXPRESSING BREAST MILK PROBLEMS ASSOCIATED WITH BREASTFEEDING (MRS. CHISENGA, MRS. MZUMARA).

BREASTFEEDING AND JAUNDICE (DR. AMADI).

PARTICIPANTS WORKING WITH MOTHERS - HEALTH TALK ON IMPORTANCE OF BREASTFEEDING.

INDUCED LACTATION AND RELACTATION; (MRS. MBELENGA).

BABY FRIENDLY HOSPITAL INITIATIVE/TEN STEPS TO SUCCESSFUL BREASTFEEDING (DR. AMADI).

FORMULA MARKETING. WHO CODE ON MARKETING OF BREAST MILK SUBSTITUTES; (MRS. CHISENGA).

PRACTICALS - HELPING FIRST TIME MOTHERS TO SUCCESSFULLY BREASTFEED - POSITIONING.

| CULTURAL TRADITIONS AND BELIEFS RELATED TO BREASTFEEDING;
| (MRS. CHINTU).

| BREASTFEEDING AND DIARRHOEAL DISEASE CONTROL; (PROF. BHATO.

| CONTRADICTIONS AND CONTROVERSIES OF BREASTFEEDING;
| (DR. PANDEY).

| VIDEO FILM SHOWN TO MOTHERS: FEEDING LOW BIRTH WEIGHT BABIES.

KANGAROO MOTHER CARE.

| DISCUSSION WITH MOTHERS ON THE ABOVE VIDEO FILMS.

| FORMULATION OF WARD POLICY ON BREASTFEEDING; (DR. AMADI, MRS.
| CHISENGA, MRS. MBELENGA).

APPENDIX 2

REASTFEEDING POLICY FOR WARD D-11

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REASTFEEDING POLICY FOR WARD D-11

1. INFORM ALL MOTHERS WHOSE BABIES ARE ADMITTED IN THE WARD ABOUT THE BENEFITS OF BREASTFEEDING WITH EMPHASIS ON EXCLUSIVE BREASTFEEDING FOR THE FIRST 4-6 MONTHS AND CONTINUED BREASTFEEDING FOR TWO YEARS THEREAFTER WITH APPROPRIATE SUPPLEMENTS
2. HELP MOTHERS TO INITIATE BREASTFEEDING AT THE EARLIEST POSSIBLE TIME WITH EMPHASIS ON POSITION, ROOTING, LATCHING-ON AND HOW WAKE UP A SLEEPY BABY FEEDS AND BURPING.
3. NO PRELACTEAL FEEDS TO BE GIVEN TO BABIES ADMITTED IN D-11, UNLESS MEDICALLY INDICATED.
4. MOTHERS SEPARATED FROM THEIR BABIES TO BE INSTRUCTED ON HOW TO MANUALLY EXPRESS BREASTMILK. THIS SHOULD BE GIVEN BY CUP AND SPOON IMMEDIATELY. IF THIS IS NOT POSSIBLE, THE MILK SHOULD BE PROPERLY LABELLED (MOTHER'S NAME, FILE NO., SEX OF BABY AND THE ROOM WHERE THE BABY IS ADMITTED) AND STORED IN THE FRIDGE FOR NOT MORE THAN 24 HOURS.
5. NO BOTTLES OR TEATS TO BE TO BE USED. ALL BABIES SHOULD BE FED BY CUP AND SPOON OR NASOGASTRIC TUBE, IF THEY CANNOT BE PUT ON TO THE BREAST.

6. ALL BABIES TO BE FED EVERY 3 HOURS, MINIMUM 8 FEEDS PER DAY FOR APPROXIMATELY 10-25 MINUTES PER SIDE. BOTH BREASTS TO BE USED AT ALL FEEDING TIMES.
7. BREASTFEEDING MOTHERS ARE TO HAVE THEIR BREASTS EXAMINED FOR EVIDENCE OF LACTATION OF BREASTFEEDING PROBLEMS, AT LEAST ONCE EVERY NURSING STAFF SHIFT.
8. SEPARATED INFANTS MUST RECEIVE THEIR OWN MOTHERS' EXPRESSED BREASTMILK UNLESS ALTERNATIVE FEEDING ORDERS HAVE BEEN WRITTEN BY THE PHYSICIAN IN CHARGE.
9. AT LEAST 24 HOURS BEFORE DISCHARGE, THE MOTHER AND INFANT WHO HAVE BEEN SEPARATED SHOULD BE BROUGHT TOGETHER FOR AN OPPORTUNITY TO REINSTITUTE EXCLUSIVE BREASTFEEDING. THE PAIR SHOULD BE DISCHARGED ONLY AFTER BREASTFEEDING HAS PROGRESSIVELY NORMALLY.
10. ON DISCHARGING, ADVISE THE MOTHER TO BRING THE BABY BACK TO THE WARD IMMEDIATELY IF THE BABY IS REFUSING FEEDS OR IF MOTHER HAS A PROBLEM WITH BREASTFEEDING.
11. MOTHERS WITH MULTIPLE BIRTHS MUST FEED ALL THE BABIES AT EVERY FEEDING TIME.
12. ON DISCHARGE, ADVISE MOTHERS TO WAKE THE BABY UP FOR FEEDS.

APPENDIX 3

BREASTFEEDING POLICY FOR D-BLOCK OUTPATIENT UNIT

1. INFORM ALL MOTHERS ON THE BENEFITS OF EXCLUSIVE BREASTFEEDING, AND THERAFTER FOR TWO YEARS WITH APPROPRIATE SUPPLEMENTS.
2. CONTINUE HOME FOLLOW-UP OF BABIES WITH PROBLEMS AND TO MONITOR HOW BREASTFEEDING IS GOING ON.
3. NO FREE SAMPLES TO MOTHERS WITH LACTATION AND BREASTFEEDING PROBLEMS AND THOSE WITH MULTIPLE DELIVERIES EXCEPT FOR ORPHANS. IN CASE OF ORPHANS, TO EXPLAIN HOW TO RECONSTITUTE THE FORMULA AND TO GIVE IF BY CUP AND SPOON.
4. EXAMINE MOTHER'S BREAST AT EVERY CLINIC VISIT FOR EVIDENCE OF BREASTFEEDING PROBLEMS. EMPHASIS SHOULD BE LAID ON MOTHER-INFANT COUPLE, GIVE NUTRITIONAL ADVICE TO THE MOTHER IN ORDER TO SUCCESSFULLY BREASTFEED. REFER MOTHER TO APPROPRIATE DOCTOR IN CASE OF HER BEING FOUND TO BE ILL.
5. ENCOURAGE WORKING MOTHERS TO SUCCESSFULLY BREASTFEED THEIR BABIES. INSTRUCT THEM ON MANUAL EXPRESSION OF BREAST MILK AND LEAVE IT IN THE FRIDGE FOR 24 HOURS TO BE GIVEN TO THE BABY BY CUP AND SPOON DURING THEIR ABSENCE.
6. FORM MOTHER SUPPORT GROUPS TO HELP OTHER MOTHERS WITH BREAST FEEDING PROBLEMS.

APPENDIX 4

HOSPITAL BASED QUESTIONNAIRE FOR POSTPARTUM MOTHERS:
NEONATAL INTENSIVE CARE UNIT MOTHERS' INTERVIEWS

IDENTIFICATION DATA:

Name of Mother _____

Date of Interview _____

OBSTETRICAL HISTORY:

NO. of Pregnancies _____

NO. of Deliveries _____

NO. of Abortions _____

NAME OF BABY:

Weight _____

Length _____

Age of Baby _____

QUESTIONS:

1. When you were pregnant with this baby, did you get prenatal care?

_____ YES

_____ NO

2. If yes, where did you go? (List local resources, including Midwives and Traditional Midwives at home).

3. How many times were you examined? (See Antenatal Card if available)

_____ times.

4. While attending Antenatal Clinic, did you get advice on how to feed your baby?

_____ YES

_____ NO

5. What was the advice? (Do not read the following answers to her, just check according to her spontaneous response)

_____ Only breastfeeding

_____ Breastfeeding and other milk if
extremely needed

_____ Breastfeeding and other food e.g.
porridge, rice

_____ Infant formula from the bottle only

Other (Specify): _____

6. Do you know up to what age a baby will remain healthy on breast milk only?

_____ YES

_____ NO

7. If yes, up to what age, according to you, will a baby remain healthy on breast milk only?

_____ months.

8. Where was your baby placed right after she/he was born?

- _____ on mother's abdomen
 _____ in the same bed with you
 _____ in the same room with you, but separate bed
 _____ in the Nursery
 _____ to NICU
 _____ Do not know

9. If the bay was taken to NICU, were you told why?

- _____ YES
 _____ NO

10. If yes, explain the reason in your own words.

11. Were you given information on feeding your baby who is admitted in NICU?

- YES
 _____ NO

12. If yes, from whom did you get the information?

13. Describe the feeding instruction that has been given to you.

14. When, after the baby was born, did you start to breastfeed/express breast milk?

Expressing breastmilk _____ days after delivery

Breastfeeding _____ days after delivery

Not expressing or breastfeeding _____ days after delivery

15. If you missed coming to NICU to breastfeed/express milk, what was the reason for this? _____

16. Do you do something to keep the breast full or try to increase the milk in it?

_____ YES

_____ NO

17. If yes, what do you do (do not read answers).

_____ drink a lot

_____ drink munkoyo, chibuku or other traditional brew

_____ eat a lot of fruits and vegetables

_____ massage the breast

Other (Specify): _____

18. Have you been given instructions on how to manually express breast milk?

_____ YES

_____ NO

19. Who gave this instruction?

- _____ Postpartum Nurse
 _____ NICU Nurse/Doctor
 _____ Other Mother/Relative

20. Are you encountering any difficulties in expressing your milk?

- _____ YES
 _____ NO

21. If yes, explain the problem. _____

22. According to you, what is the best age to wean a child?

- _____ months
 _____ do not know

23. Do you plan to feed your child with any other milk or fluid in addition to breast milk at the present time?

- _____ YES
 _____ NO

24. Do you plan to give water or glucose at the present time?

- _____ YES
 _____ NO

25. Why is your baby being given formula in NICU when you are available to provide breastmilk?

_____ Not lactating yet

_____ Do not have enough milk

_____ Unable to go to NICU because I am unwell

_____ Did not know I was supposed to come and express breastmilk/breastfeed baby

Other (Specify): _____

26. When do you intend to stop breastfeeding this baby?

_____ Months

_____ Do not know.

APPENDIX 5**QUESTIONNAIRE FOR HOSPITAL HEALTH WORKERS (KAP STUDY)****I. Identification Data**

Name of worker: _____

Facility: _____

Date of Interview: _____

II. Questions

1. At the hospital, you work as:-

_____ Doctor

_____ Nurse

_____ Midwife

Other (Specify): _____

2. What is your speciality?

_____ Obstetrics

_____ Paediatrics

_____ General Practice

_____ Intern

_____ Resident

_____ Student Midwife

3. In which area do you actually work?

_____ Labour and delivery

_____ Postpartum work

_____ Neonatal Intensive Care Unit

4. How long have you worked there?

_____ Years

_____ Months

5. Have you read something about Lactation Management?

_____ YES

_____ NO

6. If yes, where did you read it?

_____ Medical textbook

_____ Professional Journal

_____ Handout from Pharmaceutical Company

_____ Newspaper

7. When do you recommend to a Postpartum mother to give the first breastmilk?

_____ At birth

_____ 1 - 3 hours after birth

_____ 4 - 6 hours after birth

_____ 7 - 12 hours after birth

_____ Only on demand, at least every 3 hours

Other (Specify): _____

8. How often do you recommend that a mother of a full term (3.5 Kg) infant to feed her baby?

_____ Every 1 or 2 hours

_____ Every 3 or 4 hours

_____ On demand but at least every 3 hours

_____ Do not recommend breastfeeding.

9. Do you recommend water, glucose or tea for a newborn during the first few hours of life?

_____ YES

_____ NO

10. Why? _____

11. What do you recommend for a newborn while waiting for the mother's milk to come in?

_____ Water

_____ Glucose

_____ Formula milk

_____ Glucose and Formula milk

_____ Nothing

12. Do you advise that mothers be allowed in the NICU?

_____ YES

_____ NO

13. Why? _____

14. At the hospital where you work, what is the first feed that is given to a newborn baby admitted to NICU?

_____ Glucose
 _____ Formula milk
 _____ Mother's milk

Other (Specify): _____

15. If the baby is not given mother's milk as first feed, explain why.

16. In the hospital where you work, are mothers and babies kept together day and night or separated during most or part of the day or night?

_____ Kept together at all times, day and night

_____ Kept together in day time, but separated at night

_____ Kept separate at all times but mothers go to the nursery at feeding times.

17. In your opinion, should mothers and babies be kept together day and night or should they be separated most or part of the day and night?

_____ Kept together at all times, day and night

_____ Kept together in day time, but separated at night

_____ Kept separate at all times but mothers go to the nursery at feeding times

18. If a breastfeeding mother with a month old baby comes to you because she thinks she does not have enough breastmilk, what should you advise her to do first? (Circle the most important one only).

- _____ Tell her to stop breastfeeding
- _____ Tell her to replace one or more feeds with formula milk or other feeds
- _____ Tell her to breastfeed first and then give a supplement of formula or cow's milk
- _____ Tell her to start giving semi-solid food
- _____ Tell her to breastfeed more often
- _____ Tell her to eat a better diet
- _____ Tell her to drink more fluids

19. Which of the following five things are important for a good supply of breastmilk? (Please put 1 - most important; 5 - least important).

- _____ Mother prepares breast during pregnancy
- _____ Mother eats a good diet
- _____ Mother is relaxed and wants to breastfeed
- _____ Mother drinks plenty of fluids
- Baby suckles more frequently

20. What do you think Nurses at the Antenatal Clinic should discuss with a pregnant woman/look for in the pregnant woman regarding feeding her baby?

_____ Check breasts for potential
breasfeeding problems

_____ Check mother's diet

_____ Inform the woman about the benefits and
management of breastfeeding

_____ Discuss her breastfeeding history

Other (Specify): _____

21. If a mother has to return to work after 2 months, what do you think is the best milk to feed her baby with whilst she is at work?

_____ Formula milk

_____ Cow's milk

_____ Expressed breastmilk

_____ Do not know/No answer

22. What sort of feeding utensil should be used?

_____ Bottle

_____ Cup (and/or spoon)

_____ Do not know/No answer

23. Some facilities find that they sometimes have to use infant formula. Can you tell me for which babies formula is used in the facility where you work.

_____ Underweight babies
 _____ Sick babies
 _____ Abandoned babies
 _____ Babies whose mothers do not have enough milk
 _____ Babies who are in the nursery at night
 _____ Babies of dead or very sick mothers
 _____ It is not used at all
 Other (Specify): _____

24. For which babies do you think it should be used?

_____ Underweight
 _____ Sick babies
 _____ Abandoned babies
 _____ Babies whose mothers do not have enough milk
 _____ Babies of dead or very sick mothers
 _____ It should not be used at all
 Other (Specify): _____

25. At what age do you think the mother should introduce the following items into the child's diet?

	<u>DAYS</u>	<u>WEEKS</u>	<u>MONTHS</u>
Water	_____	_____	_____
Fruit juice	_____	_____	_____
Cereals	_____	_____	_____
Glucose water	_____	_____	_____

26. Does the maternity facility in which you are in-Charge have a written Policy on Promotion of Breastfeeding?

_____ YES
 _____ NO

27. If so, how do you let the Nurses know about this Policy?

_____ Written Policy on display (Interviewer check here, if this is to be seen).
 _____ Guidelines distributed
 _____ Oral briefings to staff by ward Sisters
 _____ Oral briefings to staff by someone else (who).

28. If an expectant or newly delivered mother wants to bottlefeed her baby from birth, what would you advise to do? (Interviewer give options)

_____ Very strongly persuade her against it
 _____ Advise her against it
 _____ Allow her to make her own decision
 _____ Advise her to bottle feed if she can afford it.