MATERNAL AND CHILD HEALTH CARE PROVIDERS' KNOWLEDGE ON NUTRITION PROTOCOLS AND QUALITY OF NUTRITION SERVICES IN TAMALE, GHANA

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Declaration

I, Adam Issah declare that this work is my own initiative that has never been presented elsewhere for a MSc. Degree Award in any university.

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Dedication

This work is dedicated to my grand family and all health staff of the Tamale Metropolitan Health Directorate, northern region of Ghana.

Acknowledgements

All Grace be to Allah the most High, the most Merciful and the most Beneficent.

I acknowledge the hard work and support of my supervisors: Professor Wambui Kogi-Makau and Dr. J. K. Sehmi for their immense contributions to the success of this document. I also sincerely acknowledge Dr. Mwangi Alice Mboganie for her relentless effort and giving me the opportunity to study in this country. It would not have been possible for me to conduct this research without the financial support from UNU, I therefore thank them wholeheartedly for the sponsorship and looking forward to their continuing support some time in the near future.

Abbreviations and Acronyms

ARIs	Acute Respiratory Tract Infections
ANC	Antenatal Clinic
BASICS	Basic Support for Institutionalising Childhood Survival
BFHI	Baby-Friendly Hospital Initiative
BMI	Body Mass Index
FAO	Food and Agricultural Organisation
GHS	Ghana Health Service
GDHS	Ghana Demographic and Health Survey
GSS	Ghana Statistical Service
IEC	Information Education and Communication
IFPRI	International Food Policy Research Institute
IMR	Infant Mortality Rate
IMCI	Integrated Management of Childhood Illnesses
MCH	Maternal and Child Health/ Mother and Child Health
MHMT	Metropolitan Health Management Team
MHA	Metropolitan Health Administration
MHD	Metropolitan Health Directorate
MIYH	Maternal, Infant and Young Child Health
MMR	Maternal Mortality Rate
MOH, Ghana	Ministry of Health, Ghana
NR	Northern Region
PPAG	Plan Parenthood of Ghana
PHC	Primary Health Care
PPME	Policy Planning Monitoring and Evaluation
RCH	Reproductive and child health
RH	Reproductive Health
RHD	Regional Health Directorate
TBAs	Traditional Birth Attendants
UE	Upper East Region
UNAIDS	United States Agency for International Development

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO-	World Health Organization
WIFA	Women of childbearing age

Operational Definitions

Adequate nutrition actions- obtaining nutrition actions score equal to or greater than the median of 60.2 points.

Adequate protocols: Access to a number of protocols equal to or above the mean number

Guidelines: are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific circumstances

High knowledge on nutrition protocols- obtaining knowledge score greater than or equal to the median of 13.5 points.

High quality nutrition services- obtaining quality service score greater than or equal to the median of 58.8 points.

Inadequate nutrition actions- obtaining nutrition actions adequacy scores less than 60.2 points.

Inadequate protocols: Access to a number of protocols lower than the mean number

Knowledge of nutrition protocols-: Ability of a health care provider to mention appropriately, any number of service protocols and indicating correctly, the nutrition supplies required including the service contacts for which the protocols are applied.

Low knowledge on nutrition protocols- obtaining knowledge score less than the median of 13.5 points.

Low quality nutrition services- obtaining quality nutrition service score less than the median of 58.8 points.

Nutrition counselling: A systematic and persuasive approach to establishing nutritional knowledge, believes, and practices of a target individual or group of individuals through enquiry about their own practices and informing and educating them in order influence a better outcome.

Nutrition protocols: - Standards or guidelines which determine what needs to be given or nutrition actions to be carried out in different situations for different age groups.

Outreach service delivery points: These, unlike the static points, are places where primary health care services, mainly MCH are delivered, usually on monthly rotating basis in communities. The choice of the points for meeting between care providers and clients are not fixed.

Quality nutrition actions: - Nutrition actions delivered with the right tools/ equipments, supplies, and with the correct information, communication and education in relation to protocols or guidelines.

Static service delivery points: These are fixed designated spots or places where primary health care services, mainly MCH services are delivered on daily basis.

Abstract

The purpose of this study was to determine accessibility of protocols, MCH service providers' knowledge on nutrition protocols and the quality and adequacy of nutrition actions they deliver in order to generate ideas and make recommendations that would improve nutrition component actions in MCH services in Tamale, Ghana.

A cross sectional assessment of MCH care providers' in government health care delivery institutions within and surrounding communities of Tamale was conducted. The target populations were the health care providers' and their clients' (pregnant and lactating women and young children). A simple random process was used to select 41 service providers and 28 health facilities across the six sub-districts of Tamale.

Tools used in data collection were set of questionnaires, structured observation guides, and checklists on nutrition supplies available compared to the recommended amounts per service contact.

Findings from the study revealed that the mean nutrition protocols accessible to service providers was 2.8, and ranged from 1 to 5. About 57.5% of service providers had access to adequate number of protocols whilst 42.5% had inadequate protocols. The mean protocol knowledge score was 15.1, which ranged from 4.5 to 25.5. In all, 44% and 56% respectively of service providers had low and high knowledge on protocols. The mean quality service score was 62.49, and ranged from 34 to 91.67. 63% and 37% of service providers delivered high and low quality nutrition services respectively. The distribution of service providers between the two levels of protocols accessibility, knowledge and quality of nutrition services were all statistically insignificant. However, the distribution of service providers delivering adequate and inadequate nutrition services was significant

(Chi-Square statistic 7.049, $p = 0.008$). A Likelihood ratio Chi-Square test between the associations of knowledge to the category of service providers' was significant (11.463, $p = 0.003$). There were significant correlations between service providers' knowledge and quality of nutrition services (0.645, $p < 0.05$); and between service providers' knowledge and adequacy of nutrition services (0.353, $p = 0.024$). Also significant was a correlation between service providers' years of practice and quality of nutrition services (0.654, $p < 0.05$). No significant association was found between the categories of service providers' and quality of nutrition services.

Based on the study findings, the hypothesis that 'there is no significant difference in the quality of nutrition services between rural and urban health facilities' cannot be rejected. However, two hypotheses namely: 'Service providers' knowledge on protocols is not significantly associated with the quality of services'; and Service providers' years of practice have no significant effect on the service quality' are both rejected.

In conclusion, protocols accessibility was adequate since more majority (57.7%) had access to adequate number of protocols. But the protocols were poorly distributed among the different categories of service providers. Community Health Nurses had very limited access to a variety of nutrition protocols even though they made contacts with the highest number of clients compared to Nurse-Midwives or Staff Nurses. There was inadequate knowledge on service protocols by service providers. Slight variation was observed in the proportions of knowledgeable service providers between the urban and rural health facilities. Nevertheless, that did not significantly affect quality service delivery between the two settings. However overall, there was low delivery of quality nutrition services. Factors that hindered service providers' from using protocols were inadequacies of

nutrition supplies service providers' poor knowledge on protocols and clients' non-compliance to treatment protocols.

Some recommendations generated following the study findings are:

1) Higher priority should be given to Community Health Nurses in the distribution nutrition protocols.

2) Distribution of nutrition supplies should be consistently monitored.

3) Forums should be created to enable service providers' opportunity discuss and share knowledge and information on current service delivery practices.

4) When planning and organizing in-service trainings, Community Health Nurses should be top priority.

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CHAPTER ONE

1.0 Introduction

1.1 Background

Protocols are written down procedures that determine how planned service activities should be carried out (Korh and Hravnak 2006; Andrew and Judy 2005). Nutrition protocols determine how much of what needs to be done or given in particular situations for different age groups (Sanghvi et al. 2004, BASICS 2004). Guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific circumstances (Korh and Hravnak 2006). Protocols and guidelines are tools that ensure that service development and delivery is driven by evidence of clinical effectiveness as well as improves safety and consistency of care. They help to co-ordinate health services across a range of environments; they give staff opportunity to work in new ways to make the best use of their skills, knowledge and expertise; and they address the key questions of what, where, when and by whom (Andrew and Judy 2005).

Protocols and guidelines are terms often used interchangeably. Nevertheless, there is some difference in their technical meanings, which stem from their application. Both are based upon clinical standards that define minimal acceptable practice. Protocols unlike guidelines, are very rigid, and define a specific management plan in a step-wise fashion with little room for adjustment. Each is necessary where there is or likely to be variation in practice that affect patient outcomes.

1.1.1 Use of Protocols and Guidelines at Enhancing Quality of Services

Care that meets acceptable technical standards as well as the needs and expectations of users and communities is good quality service (Schneider and Gilson 2003). Attributes of good quality health care services (Maternal and Child Health Bureau 2004, WHO 1998a) in general include: have on hand all essential supplies; is comprehensive; staffed by technically competent health care providers relying on guidelines and protocols for management and staffed by workers who provide respectful and non-judgmental care that is responsive to clients' needs. Others are: provide information and counselling for clients based on their health and health needs; and involve clients' in decision-making, and see them as partners in health care and active participants in protecting their own health. Health service practice based on guidelines and protocols aid service providers in making good decisions about specific aspects of care, such as diagnosing and providing appropriate treatment or management. The knowledge and use of protocols that are based on the best available evidence of practice enable organizations to provide the most effective and safe health care efficiently with minimum risks and maximum benefits (Chege, Sanogo and Askew, 2006).

1.2 Statement of the Problem

High quality maternal and child health (MCH) services must be part of a continuum of health care spanning from pre-pregnancy to postpartum period, and in which women and health care providers are partners. Globally, over half a million women die from complications of pregnancy and childbirth each year with nearly 99% occurring in the developing world. For every woman who dies, 30 to 50 others suffer injury, infection, and malnutrition such as iron deficiency anaemia (WHO 1998a). Less than half of women in developing countries get

quality MCH during and soon after childbirth. About 35% of women in developing countries receive no antenatal care, 50% giving birth without skilled attendants whilst 70% receive no postpartum care in the six weeks following delivery.

In Ghana major disparities exist in the distribution of MCH service providers and access to services between the different parts of the country, contributing to differences in mortality rates. For instance, in the north, infant mortality rate is estimated at 234/1000 live births while in the south, the urban city of Accra has an estimated 85/1000 live births. Trained Nurse-Midwives conduct only 25% of deliveries in Ghana. A third of all supervised deliveries and immunizations take place in Accra with 28% of all public health nurses, and 15% of Community Health Nurses serving in Greater Accra alone (Ofosu 2005).

Restrictions in funding assistance to the Planned Parenthood Association of Ghana (PPAG) have worsened existing difficulties in promoting reproductive and child health (RCH) services with peri-urban and rural areas being most affected. The funding cuts have curtailed rural outreach programmes and reduced nursing staff by 40 percent (Population Action 2005). These have inevitable repercussions on quality and numbers of served clients served.

Maternal deaths audits have revealed that unsafe abortion and poor quality of MCH services are the causes of high maternal mortality rates in Ghana (Population Action 2005).

1.3 Justification of the Study

High quality MCH services are required at all times and at all settings and do not have to be hospital-based. It is required in the home, rural and urban health facilities and not only in well-equipped hospitals in large cities. To ensure a continuum of quality health care requires enforcement on the use of standard guidelines and protocols in service delivery in an integrated manner (USAID 2004, Schneider and Gilson 2003, Sanghvi et al. 1999).

1.4 Aim of the Study

The aim of the study was to contribute to enhancing the quality of MCH services in Tamale and Ghana as a whole.

1.5 Purpose of the Study

The purpose of the study was to determine MCH service providers' knowledge on nutrition protocols and guidelines in the delivery of MCH services.

1.5.1 Main Objective of the Study

The main objective of the study was to assess MCH service providers' knowledge on protocols and quality of nutrition actions delivered in Tamale, Ghana.

1.5.2 Sub-objectives

The study had the following sub-objectives:

a) To determine accessibility of nutrition protocols to MCH service providers,

b) To determine MCH care providers' knowledge levels on nutrition protocols,

c) To assess the quality (adequacy) of nutrition services in relation to their protocols,

d) To determine differences in service quality between urban and rural health facilities,

e) To identify factors hindering the use of nutrition protocols,

f) To generate ideas on improving or strengthening nutrition actions in MCH services.

1.6 Research Questions

The study posed six research questions as follows:

1. Are nutrition component services delivered according to their protocols or guidelines?
2. What proportions of service providers deliver quality nutrition services?
3. How adequate are nutrition supplies and services as per protocols?
4. What constraints do service providers face related to use of nutrition protocols?
5. Is there a difference in the delivery of quality nutrition services at urban and rural areas?
6. Are there differences in quality of services delivered by MCH care providers?

1.7 Study Hypotheses

Three study hypotheses were postulated as follows:

1. There is no significant difference in the quality of nutrition services delivered between rural and urban health facilities,
2. Service providers' knowledge on nutrition protocols is not significantly associated with the quality of services they deliver, and
3. Service provider's years of practice have no significant effect on the service quality.

CHAPTER TWO

2.0 Literature Review

2.1 Overview on Protocols and Health Services

Use of protocols in the delivery of health services is not a recent phenomenon but gained prominence in the early 1970s, when outcome studies identified extensive differences among practitioner management strategies for patients with the same health problem. The development of health and nutrition service protocols assist in standardizing management of illnesses by using a consensus of current and evidence-based management strategies (Korh and Hravnak 2006, Schulman and Rienzo, 2005).

Six specific MCH service contact opportunities exist between care providers and clients: Prenatal care contact, Delivery and immediate postpartum contact, Well baby visits, Sick child visits, Immunization contacts, and postnatal contact for mothers and infants (LINKAGES/ USAID 2005, Sanghvi, Murray, et al. 2003). Each service contact has a set of nutrition actions delivered based on their established protocols. Three general classes of nutrition protocols are available: those best applied specifically for maternal health contact, child health contact and those applicable in both maternal and child health contact (Sanghvi et al. 2004, BASICS 2004). Nevertheless, there are no rigidities in the application of these protocols during any specific contact. What is essential is for service providers to make maximum use of each contact opportunity in order to deliver as many essential nutrition services deemed and appropriate.

2.2 Nutrition Actions and Protocols in Maternal Health Contacts

2.2.1 Nutrition Actions and Protocols in Prenatal (ANC) Contacts

Every year, more than 500,000 women die from pregnancy and childbirth related complications worldwide (UNICEF 2004). Maternal malnutrition is associated with both maternal morbidity and mortality in several ways, including inadequate dietary intakes and diversifications to frequent multiple births. Iron deficiency anaemia in pregnancy is associated with an estimated 111,000 maternal deaths each year (UNICEF 2006a, Bowley 2004).

In countries of endemic anaemia, every woman who attends antenatal clinic is to undergo thorough screening for anaemia and given nutrition counselling. They are also recommended to receive iron and folic acid tablets according to anaemia preventive and/ or treatment protocols (UNFPA, 2006, UNICEF 2005b, Galloway 2003, WHO 2002). If the screening reveals presence or signs of malaria and/ or anaemia, then, the treatment protocol in appendix 2C is followed. Prevalence of anaemia among pregnant women in Ghana is 65% (GHS 2004). Supplementation of iron and folic acid therefore need to continue in to the first six weeks postpartum in accordance to a WHO (1998a) recommendation. WHO (2004) also recommends that if it is not possible for pregnant women to receive the supplements for up to 182 days during the pregnancy period, then the daily dosage should be increased or continue the supplementation in to the early six weeks postpartum.

Between 2003 to the first half of 2005 ANC attendance at antenatal clinics within Tamale steadily increased, where four or more ANC visits increased more than twice in 2004 and

remained high in the same period of 2005 (MHMT 2005). A USAID report (2003) revealed that only 51% of ANC women received daily supplements of iron and folic acid tablets according to WHO protocol. Nineteen and twenty-six percent of women received iron and folic acid for up to 2 months and 1 month respectively, whilst 11% never received any supplements during their pregnancy.

In areas of endemic parasitic diseases such as worms' infestation, it is recommended that pregnant women receive antihelminths drugs according to the protocol in appendix 4D and giving appropriate family planning counselling (UNFPA 2006, Maternal and Child Health Bureau 2004).

2.2.2 Nutrition Actions and Protocols in Postnatal Contacts

Among other vital nutrition actions during postnatal contacts are postpartum vitamin A supplementation of mothers within the first six weeks after delivery, and continued iron and folic acids supplementation for those who received less than the maximum of 182 iron and folic acid tablets during pregnancy. The dietary and health needs of women also need to be assessed and each woman counselled appropriately on their diets as well as the health of their infants' (Schulman and Rienzo 2005, PPME/ GHS 2003). Postnatal women require vitamin A supplementation based on the protocol: 400,000IU in two separate doses for at least 24 hours apart (LINKAGES/CORE 2005). Protocol for continuation of iron and folic acid is shown in appendix 4A.

2.3 Nutrition Actions and Protocols in Child Health Contacts

2.3.1 Nutrition Actions and Protocols in Sick Child Contacts

The link between nutrition and disability has been firmly established with research findings showing children who have been disabled by micronutrient deficiencies (vitamin A, iodine, folic acid). Obvious links include iodine deficiency, which can lead to reduced intelligence quotient, and cretinism and mental retardation in severe cases, and vitamin A deficiency to blindness (VIC 2003). Diseases of nutritional importance in early childhood or infancy include malnutrition, acute respiratory infections (ARIs), measles, malaria and/ or anaemia and diarrhoeas (UNICEF/ GHS 2003, WHO 2004). There are protocols for treatment of children and infants who have suffered from any of these illnesses. Service providers are required to assess and treat such illnesses if present, in addition to readdressing the health/ nutrition complaints that might have been presented during any contact (Reinberg 2005, Sanghvi et al. 2004, Bowley 2004). Children who are suffering from measles are to receive vitamin A capsules according to the protocol in appendix 5A.

More than 1.5 million children under five continue to die each year as a result of acute diarrhoea (WHO 2004). This number can be drastically reduced through critical therapies such as prevention and treatment of dehydration with ORS and fluids available at home, breastfeeding, continued feeding, and reinforcing family knowledge on prevention and treatment of diarrhoea. Bowley (2004) and WHO/ UNICEF (2004) have both recommended the protocol on selective use of antibiotics and zinc supplementation of 10- 20 milligrams of zinc for 10–14 days in all episodes. Children suffering from infectious diarrhoeas need to

receive vitamin A as part of their management according to the protocol in appendix 5A. (UNFPA 2005, Bowley 2004, Bowley 2003).

2.3.2 Nutrition Actions and Protocols in Well Baby Contacts

A non exhaustive list of nutrition actions recommended during well baby contacts include growth monitoring and promotion, assessment of children feeding, assessing and completing vitamin A supplementation to each child, appropriate counselling of caretakers on the nutrition/ health of children, and assessment and continuation of iron and folic acid supplementation to mothers who were unable to complete recommended intakes during pregnancy (Sanghvi et al. 2004, GHS/World Bank 2003, GSS 2003). Adequate growth is an indicator of a healthy child and poor growth an early sign of nutrition and health problems. Growth and its monitoring and promotion are meant to identify children with problems before malnutrition occurs (Child Health Dialogue 2000, Child Health Dialogue1998).

A protocol on growth monitoring and promotion for children under five years is as follows; Weigh all children, plot the weight of each child in their health record books, use each child's weight to counsel the mother, negotiate with each mother on appropriate actions to be taken at home in order to improve the child's nutrition/ health, and assess and encourage good childcare practices. Mothers also need to be educated on preventive measures against childhood killer diseases such as malaria through the use of treated bed nets, good sanitation practices, prevention of malnutrition, and prevention of ARIs (GHS/World Bank 2003).

2.4 Nutrition Actions and Protocols in both Maternal and Child Health Contacts

Protocols and guidelines commonly used during both maternal and infant contacts are not entirely different from those used in child health and maternal health contacts. These are protocols on delivery and/ or immediate post-delivery care for mothers and their infants including a blend of the other two mentioned above.

UNICEF (2001) guidelines on infants feeding and appropriate care practices known as 'the 10 Steps to Successful Breastfeeding' is among these guidelines. The guidelines for counselling HIV positive mothers on appropriate breastfeeding is as follows; Shorter duration of breastfeeding; breastfeed exclusively in the early months (first 3 months) of infants life; Prevent and treat breast problems; Prevent HIV-infection during breastfeeding; and treat sores in the mouth of the infant very early (UNICEF 2006b, Bowley 2005). Other protocols of common usage during both mother and infant contact are immediate postpartum vitamin A supplementation, and woman's dietary needs. The details on guidelines used during both maternal and child health service contact are shown in appendix 6 in page

2.5 Review of Methodologies

A methodology to determine quality of service delivery and perceptions of beneficiaries as well as frontline providers about a Food Assisted Maternal/ Child Health and Nutrition programme in Haiti used a methodology that included observations, and semi-structured interview questionnaires (Loechl, Ruel et al., 2005). Other study designs, to determine Mothers' Knowledge Levels on Mother-to-Child-Transmission (MTCT) of HIV, Oguta

(2002) and Nyankuru (2002), Assessment of Knowledge, Attitudes and Practices of trained Community Resource Persons, used cross sectional exploratory and cross sectional descriptive respectively. Data collection in both methodologies included semi-structured questionnaires, direct observations and focus group discussions (FGDs). In addition, Nyankuru conducted key informant interviews.

In the study however, to overcome the challenges of observer biases, structured observation guides were used instead of direct observations. In addition, semi-structured questionnaires were used to allow flexibility of interviewers to include relevant information that respondents provided.

2.6 Summary of Gaps in Knowledge

A major gap in knowledge on MCH identified was the lack of documentation of information on service providers' knowledge on nutrition protocols in MCH services. More so, since year 2000 no assessment has been conducted on the quality of services provided by primary health care practitioners (GHS 2004, MOH/Ghana 2004). The interval time between any successive assessments of providers' activities, particularly at the peripheries, is often too long, contributing to the neglect of essential nutrition actions as part of the MHC. In addition, the extent to which PHC care providers' knowledge on service protocols affect the quality of services they deliver is unknown, and if at all, rarely documented..

CHAPTER THREE

3.0 Study Setting and Research Methodology

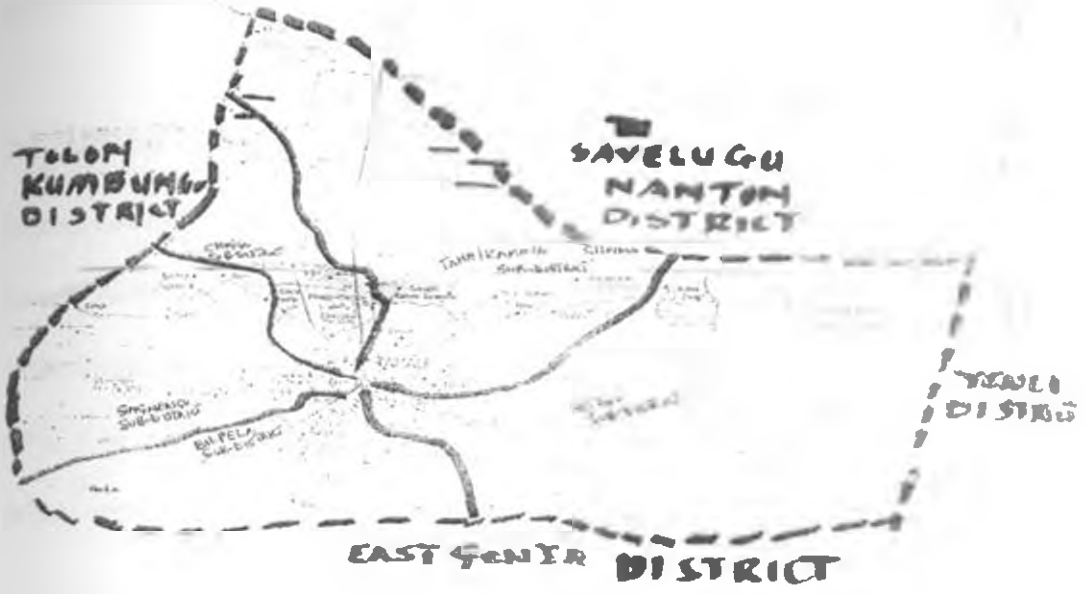
3.1 Study Setting

3.1.1 Study Area

This study was conducted in Tamale in the northern region of Ghana. Ghana is divided in to 10 administrative regions and has a total population of 20 million people (FAO/ WHO/Ghana 2004).

Northern region is one of the ten and the largest in terms of land size, occupying about one-third of the surface area of Ghana. It has a population of 1.85 million people with 318,634 living in Tamale (MHMT 2004, Zimiki et al. 2000). Located in the centre of the region 175km east of longitude 1° west and latitude 9° North, Tamale is one of the thirteen (13) districts of the northern region and bounded to the north by Savelugu-Nantong District, to the south by East and West Gonja Districts, to the east by Yendi District and to the west by Tolon-Kumbungu District. It is divided in to six sub-Districts of health (Sub-DHMTs).

Figure 1 Boundaries, sub-districts and health facilities in Tamale



3.1.2 Study Area Population

Tamale is a multiethnic Metropolitan town of diverse languages. Approximately eighty per cent (80%) of the population is 'Dagbamba', and the remaining twenty per cent speak other local languages (Zimiki et al. 2000). Islam is the predominant religion constituting about 84% of the population, while Christians constitute 13.6%, Traditionalists 1.6% and others less than 1% (MHMT 2005).

Main economic activities are crop and animal production. The food crops that are grown include cereals such as maize, rice, millet, guinea corn, and tubers as well as legumes (groundnuts, beans and cowpea). Animals such as cattle, sheep, goats and fowls are also reared.

Rainfall pattern and climate are typical of savannah region characterised by longer period of dryness and excessive dry winds known as the Northeast trade winds ('*Hamatarn*').

3.1.3 Housing Systems and Settlement

Tamale has two settlement and housing patterns. Within the township are found urban block houses surrounded by rural communities with typical characteristics of rural housing. The urban houses are well arranged linearly, with larger compounds containing smaller family units. The housing and settlements at the periphery are typical of rural areas. Houses are indiscriminate and sparse usually built with mud and roofed with thatch. (Zimiki et al. 2000). Tamale is enjoys well treated water supply from the Dalong. About 80% of Tamale also enjoys electricity from a hydroelectric dam at Aksombo.

3.1.4 Health and Social Service Infrastructure

Northern region has one of the poorest infrastructures for health and also one of the least equipped with health service personnel. There were twenty-seven health facilities including the Teaching hospital during the study period. Table 1 is a breakdown of health care facilities and type of services they offer.

Table 1 Health facility types in Tamale

Number	Facility type	Type of services offered
11	Government facilities	General health services
9	Private	Specific type of services
2	Quasi-governmental	MCH services
1	Community Initiated Clinics	MCH plus other services
1	Christian Association of Ghana (CHAG)	MCH services
1	Teaching hospital	General medical problems
2	Community Health Planning Services (CHPS)	MCH plus other services
27	Total	

(Source: MHMT 2004 Annual Performance Review Report).

3.1.5 Health Service Staff

A total of 182 health personnel were serving in Tamale during the study period. These comprised of all categories of health professionals namely Nurses, Nutritionists, Medical Assistants, Medical Doctors, Paramedics, and Ward Assistants. However, those in charge of primary health care services were 83, constituting all categories of nurses (Midwives, Community Health Nurses, Public Health Nurses and State Registered Nurses) (MHMT 2005).

3.1.6 Health Problems

Among other major health problems in is malnutrition due to poverty and low food productions, majority are dependent on subsistent farming or sales of farm produce. FAO/ WHO/ Ghana (2004) report revealed that malnutrition in the northern region is high, particularly acute malnutrition. However, the Demographic and Health Survey report (GSS 2003) indicate that malnutrition levels in some areas is as high as 30% among children under five years and levels of chronic energy malnutrition women is also high. The report indicated

that women with body mass index (BMIs) below 18.5-kg/ m^2 were seven per cent, whereas in the northern region it was eight per cent.

Malaria, anaemia, acute respiratory tract infections (ARIs), and diarrhoea continue to be among the most common and top causes of childhood illnesses and main causes of admission at the health facilities in the area (FAO/ WHO/ Ghana 2004). It also indicated that guinea worm that had virtually been eliminated resurfaced in the first half of 2004 in Tamale (RHD 2004).

3.2 Methodology

3.2.1 Study Design

A cross sectional assessments on MCH care providers' from government health institutions within and surrounding communities of Tamale was conducted.

3.2.2 Study Population

The study populations comprised of MCH health care providers: Community Health Nurses, Nurse-Midwives and State Registered Nurses at post during the study period.

3.2.3. Sample Size Determination

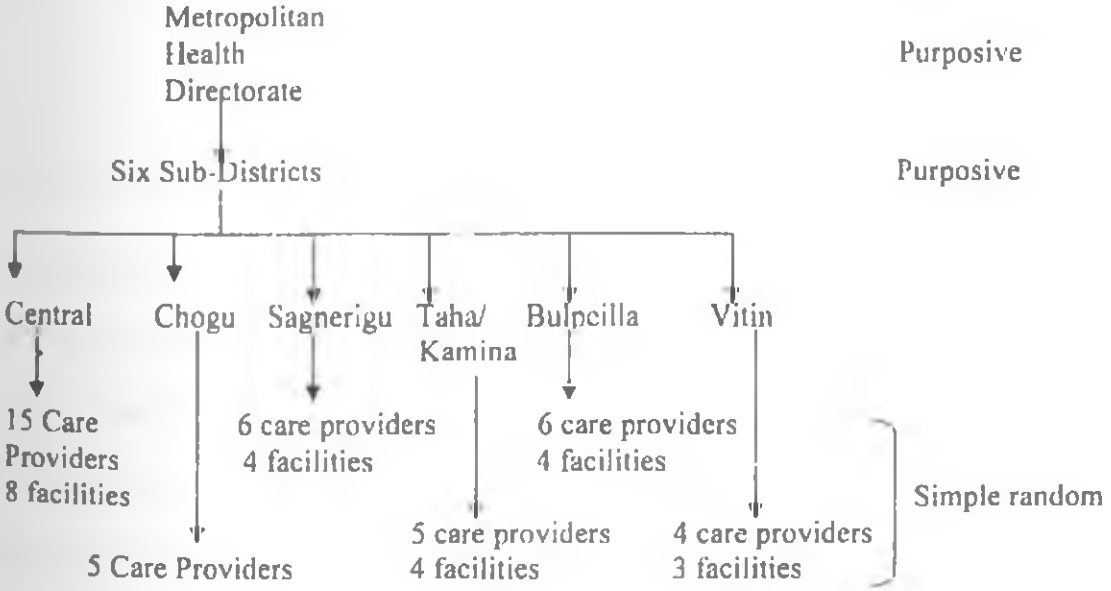
A fifty-per cent proportion of service providers' was assumed since there was no information/ data available on their knowledge levels and use of nutrition protocols. The

Metropolitan Health Management Team (MHMT) report revealed that 83 of the health care staff were nurses (MHMT 2005). Hence, half (41) were interviewed.

3.2.4 Sampling Techniques

Two basic techniques of sampling were employed in selecting health care providers and health delivery facilities. These are purposive and simple random. The Metropolitan Health Directorate and all six Sub-districts were purposively sampled, whereas a simple random process was used in choosing health facilities and health care providers. Figure 2 is a flow diagram on the steps.

Figure 2 Steps and sampling procedures of facilities, service providers and clients



3.3 Research Instruments (Tools)

Semi-structured questionnaires, checklists and structured observation guides were used to collect the data. The semi-structured questionnaires were used in collecting data on MCH care providers' knowledge on protocols and the quality of services delivered. The checklists were used to assess nutrition service supplies available for each service contact whilst the structured observation guides were used to assess actual service delivery in relation to their recommended guidelines and protocols. Details on the research tools are shown in appendixes 3, 4, 5, 6 and 7. The reason for employing semi-structured questionnaires was to allow for some level of flexibility, since not much information was available or known about care providers knowledge on nutrition service protocols. The observations were structured because protocols for each nutrition action are specific. The checklists were used to gather information on nutrition supplies availability for every MCH service contact.

3.4 Recruitment, Training and Pre-testing of Research Tools

Four field assistants were recruited, trained and put in pairs. The recruitment criteria were based on their levels of education and willingness to participate. There was no body selected with education level below secondary. Those with previous experience in similar field exercise were given top priority. Participants' recruitment was done through interactions with people within the same locality who were on holidays from the Tamale Community Health Training School.

The training took three days to complete, and covered a wide scope on maternal and child health care delivery and their guides or protocols as well as nutrition supplies requirements. Among the major issues discussed in the training were nutrition actions during MCH services. The training also dwelt extensively on interviewing techniques and observational skills in order to minimize some biases. The Field Assistants were also trained on the contents of the questionnaires and the use of the checklists for assessing availability of service supplies.

Key and specific areas emphasized in the training included

1. Counselling skills and content of messages in the counselling,
2. The approach of communication, whether clients were encouraged to ask questions or allowed to express themselves and how specific needs or concerns of clients were addressed,
3. How clients were handled regarding their privacy, client records recent or previous,
4. How service providers were able to establish what clients could do pertaining to particular nutrition behaviours rather than prescribing what they were to do and
5. They were also trained on some of the most common nutrition action protocols for MCH services in Ghana, and how to identify them in health facilities. Field assistants were taught and shown some of the commonly used manuals containing nutrition protocols used in Ghana.

More details of nutrition action protocols are shown in appendixes 4A, 4B 4C, and 4E, and 5A, 5B and 5C in pages 83 to 85.

A training curriculum on the salient topics was developed and used in the training, details of which are shown in appendix 6.

Pre-testing was done immediately after the training session was completed and the questionnaires were revised to suit the study needs. A total of eight questionnaires were completed in the one-day pre-testing exercises with each group of field assistants completing four questionnaires, checklists, and observation assessment guides. In order to avoid contamination of the study population, service providers were chosen from the two big hospitals. This is because these facilities have large numbers of service personnel who run in shifts, and therefore, the likelihood of selecting the same staff during the actual exercise as in the pre-test was negligible. However, no individual health care provider from these facilities involved in the pre-test was chosen during the actual data collection period. The pre-test findings led to refocusing of questions in the questionnaire that were either too open or narrow in focus.

3.5 Data Collection Procedures (Methods)

Two data collection procedures were employed. These are observation of health care providers' as they delivered services using the research tools. The other was an interview of the service providers who had been observed delivering services.

3.5.1 Determination of Protocols and IEC Materials Accessibility

The types and numbers of protocols and IEC materials available and accessible to service providers were determined by first counting those on display from the walls and boards of the health service structures. Service providers' were also questioned to ascertain if there were others such as manuals containing protocols and IEC materials that were not displayed. Since it was not possible to display protocols and IEC materials at outreach mobile service delivery points, service providers' were asked on the types and numbers they had.

3.5.2 Determination of Service Providers' Knowledge

The determination of service providers' knowledge levels on nutrition protocols and quality was based on ideas of Abramson, since both variables were composite ordinal categorical (Abramson, 1984). Since two types of composite scores exist, the 'raw scoring' approach was used, in which case, no particular response was graded more than the others (Abramson 1984).

Service providers' knowledge on nutrition protocols was determined by first of all, completing the set of questions in section 3 of appendix 1 on each service provider. Secondly, maximum score for each service provider was obtained by summing individual scores on the knowledge questions correctly answered. Thirdly, each service provider's scores were then used to classify him or her in to either high or low knowledge category. The classification in to the high and low knowledge category was based on the cut-offs points set. The cut-off point was based on the mean knowledge score. Thus, a knowledge score lower than the median of 13.5 points was categorized as low and scores equal to or above were

categorized in the high knowledge group. In all, a 30 points knowledge score was developed consisting of 15 response items each correct response worth 2 points and incorrect response no point. The mean was chosen since it takes accounts of all scores in the data set. The knowledge scale developed and used in the study is shown in appendix 2.

3.5.3 Determination of Adequacy of Nutrition Services

Adequacy of nutrition actions was determined by considering the amounts of nutrition supplies available against amounts required for the various service contacts. This included amounts of each supplies provided to clients as per protocol, and content of nutrition counselling (information and education) the service providers gave to clients during the contacts.

This variable was quantified similarly like service providers knowledge by assigning scores to each specific nutrition action carried out. The sum of scores obtained for the overall services and based on the mean (60.2), was used to categorize the service as either adequate for scores greater than the mean or inadequate, for service scores lower than the median. The maximum score required was 86 points.

3.5.4 Determination of Quality of Nutrition Services

The delivery of quality nutrition actions by each service provider was determined by a combination of their knowledge on protocols and adequacy of services following appendix 2B. Following the procedures used in the determination of knowledge and adequacy of services, the same approach was used in the determination of quality of nutrition actions, and

service quality level was ranked as high or low depending on whether score was higher or lower than the mean (58.8). The maximum score expected was 98 points.

3.6 Quality Control Measures of Data Collection

Since the data collection was done through observation and interviews, there were likelihood of biases by observer or interviewer and respondents. Therefore, two main strategies to overcome them were put in place. First and foremost, assistants were cautioned to observe care providers with minimum interruptions possible. Secondly, the assistants were allowed to work in two in order to afford them opportunity to discuss and interpret the data among themselves after its collection.

3.7 Data Cleaning, Entry and Analysis

3.7.1 Data Cleaning

Cleaning of the data began right in the field each time completed questionnaire or interview and observational guides were submitted. The investigator together with each group of field assistants sat and went through all the completed questionnaires in order to detect any errors and make follow-ups if necessary before the following day's fieldwork. Field assistants were closely monitored whilst they were in the field. After the entire field exercise, further cleaning of the data was done manually and again using the computer in data exploration process as a means of verification before any secondary analysis was carried out.

3.7.2 Data Entry and Analysis

Statistical Package for Social Sciences (SPSS) package was used in all data entry and analysis. As part of the data entry process, some previously pre-coded questionnaires were recoded whilst those open-ended ones were also coded to ease entry, eliminate or minimize errors to the lowest possible, and to afford orderly analysis.

Nominal scales were developed for the three categories of service providers. These were health care provider category for 1, Community Health Nurses; 2, Nurse-Midwives; and 3, Staff Nurses. Similarly, using the ordinal composite variables, codes were determined for knowledge levels: 1, high knowledge and 2, low knowledge and the same for quality of nutrition actions. However, service adequacy was coded as 1, adequate; and 2, inadequate.

Exploratory analyses of data were done by generating summarized distribution tables; charts (Pie charts and Bar charts), scatter plots and cross tabulations. Patterns of the distributions among various variables of interest were further tested using appropriate tests such as the Chi-Square Tests, Cramer's V tests and the Likelihood ratio Chi-Square Test. Confirmatory tests performed were non-parametric correlations (Spearman's rho, Kendall's tau_b), and Somers's d tests. Table 2 is a detail matrix on the data analysis tests.

Table 2 Data analysis matrix

Variables	Indicators	Statistical tests	
		Basic	Advance
Objective 1. To determine availability or accessibility of nutrition protocols to MCH providers			
♦ Years of service experience ♦ Care Provider Category	♦ Numbers and types of nutrition protocols available	Pie charts, graphs, Cross tabulation	Chi-Square test
Objective 2. To determine MCH Care Providers' Knowledge on nutrition protocols			
♦ Years of experience ♦ Category of service provider	♦ Number of care providers with high knowledge ♦ Number of care providers with low knowledge	Cross tabulation, Charts, Graphs	Sommer's d, Spearman's correlation
Objective 3. To assess the quality of nutrition actions in MCH services			
♦ Service delivery setting ♦ Nutrition supplies availability ♦ Category of care provider	♦ Amounts of nutrition supplies available per service contact ♦ Amounts of the supplies given to each client ♦ Amounts required to meet needs of attendance ♦ Proportion delivering adequate nutrition actions ♦ Proportion delivering inadequate nutrition actions	Scatter plots, Cross tabulation	Kendall's tau_b,
Objective 4. To determine differences in quality of service between urban and rural facilities			
♦ Urban ♦ Rural	♦ Frequency of care providers with high quality in urban ♦ Frequency with low quality in urban ♦ Frequency of care providers with high quality in rural ♦ Frequency of care providers in low quality in rural	Cross tabulation	Pearson Chi-square Tests, Cramer's V
Objective 5. To identify factors that contribute to poor use of nutrition protocols			
♦ Managerial ♦ Client/ Provider factors ♦ Factors related to care provider	♦ Number reporting supplies problems (inadequacy/ unavailability) ♦ Proportion of factors related to provider knowledge ♦ Number of factors related to clients compliance	Pie charts, Graphs	Likelihood ratio, Pearson Chi-square
Objective 6. To generate ideas to improve and /or strengthen nutrition components in MCH services			

CHAPTER FOUR

4.0 Results

4.1 Distribution of Maternal and Child Health Care Providers

The health and nutrition needs of women (lactating and pregnant) and young children or infants are delivered mainly by maternal and child health care providers (MCH) as part of primary health care (PHC). The majority of PHC providers are of the nursing profession, that is, Community Health Nurses, Nurse-Midwives, and Staff Nurses. They also include some medical care practitioners and nutrition Officers. In this study however, only Community Health Nurses, Nurse-Midwives and Staff Nurses were targeted since they were the sole providers of MCH care in Ghana.

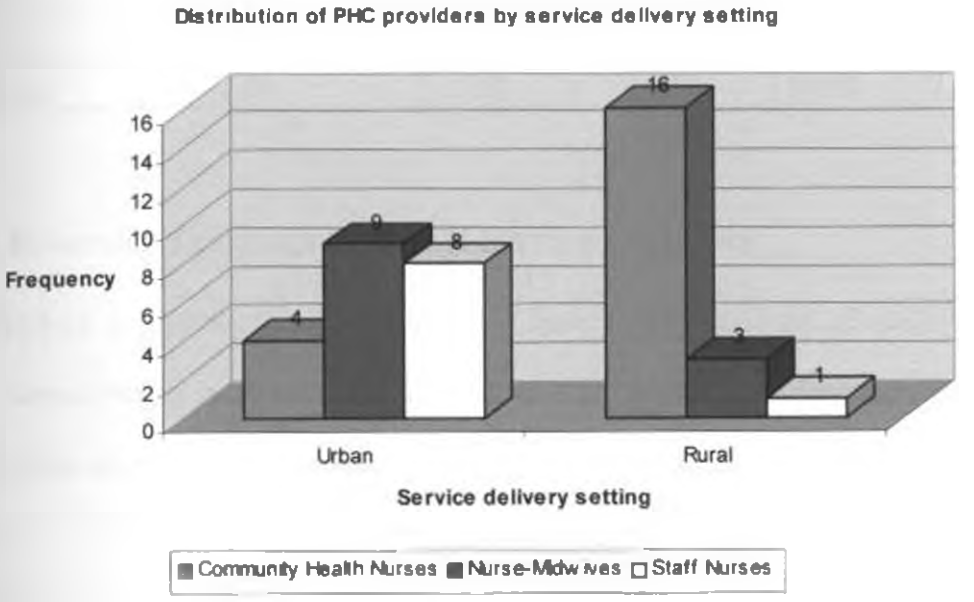
Table 3 is the distribution of the categories of MCH service providers sampled during the study. In all, 41 MCH service providers were sampled. The table shows that majority (48.8%) of service providers were Community Health Nurses, whereas Nurse-Midwives and Staff Nurses were 29.2% and 22% respectively.

Table 3 Distribution of the categories of MCH service providers

Category of service providers'	Proportion of service providers		Service delivery setting	
	Frequency	Percent	Urban	Rural
Community Health Nurses	20	48.8	4	16
Midwives	12	29.2	9	3
Staff Registered Nurses	9	22.0	8	1
Total	41	100	21	20

The distribution of the PHC providers by service delivery setting (rural and urban) in figure 3 shows that 16 (80%) of Community Health Nurses were in rural health facilities whereas a quarter 3 (25%) of Nurse-Midwives and only 1 (11.1%) Staff Nurses were in rural areas.

Figure 3



4.1.1 Service Providers' Years of Practice

Summary statistics of the three categories of service providers' years of practice are shown in table 4. The table reveals that Nurse-Midwives had higher mean, median, and minimum years of practice than the overall group of MCH service providers sampled: 13.13, 10, 9.95 and 1 respectively and both Community Health Nurses and Staff Nurses. The maximum years of practice (37) for Nurse-Midwives was also higher than for Community Health Nurses (32) and Staff Nurses (9). The mean, median and maximum

years of practice for Community Health Nurses however, were higher than that for Staff Nurses.

Table 4 Statistics of years of practice by category of service providers

Years of practice	Category of service providers			Service providers combined
	Community Health Nurses N =20	Nurse-Midwives N =12	Staff Nurses N= 9	
Mean	9.96	23.63	5.50	13.13
Median	8.50	23.50	4.50	10.00
Standard deviation	7.69	7.06	2.32	9.95
Minimum	1.00	10.00	3.00	1.00
Maximum	32.00	37.00	9.00	37.00

4.1.2 In-service Trainings for MCH Service Providers

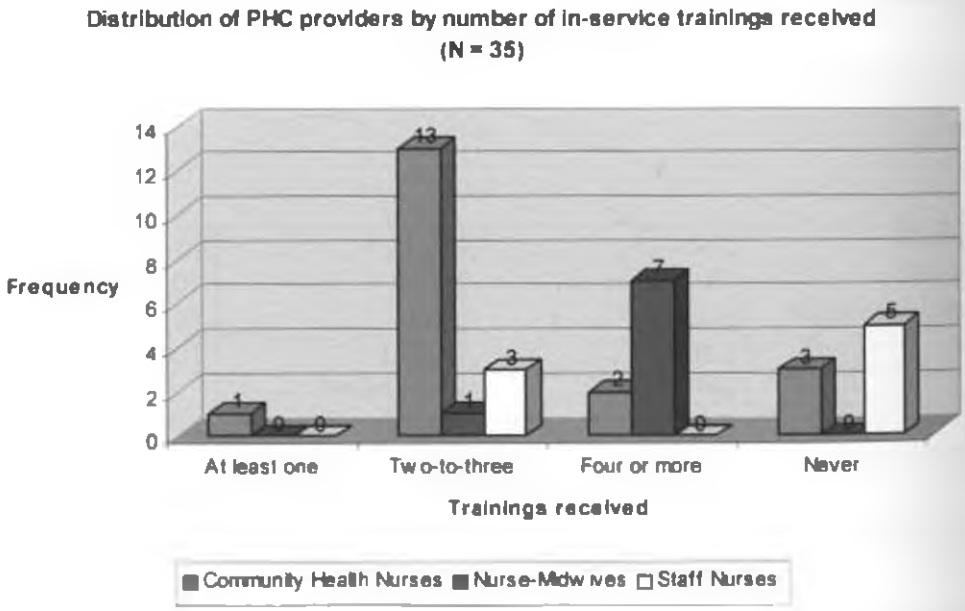
The numbers and types of in-service trainings impact on the delivery of quality health care. Assessment of in-service trainings received by service providers showed that 8 (22.9%) had never had any training in their last three years of practice prior to the study. However, a little les than fifty per cent (48.6%) and about a quarter (25.7%) of service providers participated in two-to-three and four or more in-service trainings respectively, whereas less than three percent (2.9%) participated in only one training. In all, 77% of the service providers had received some form of in-service training.

Table 5 Distribution of service providers by number of in-service trainings

Number of in-service trainings received	Number of service providers (N = 35)	
	Frequency	Percent
Never	8	22.9
At least one training	1	2.9
Two-to-three trainings	17	48.6
Four and above	9	25.7

The distribution of service providers' by category and number of in-service trainings revealed that 7 (77.7%) of Nurse-Midwives received four or more trainings, whilst only 2 (22.2%) of Community Health Nurses were and none of the Staff Nurses received any training. About 76.5% Community Health Nurses, the highest of MHC providers received two-to-three trainings whereas 5.9% and 17.6% respectively of Nurse-Midwives and Staff Nurses received training. Neither Nurse-Midwives nor Staff Nurses participated in less than two trainings and all (8) Nurse-Midwives had received an in-service training.

Figure 4



4.1.3 Service Provider-Clients Contacts

Statistics for service providers making contacts with clients showed that on the average, Community Health Nurses made contacts with higher mean of clients per month than either Nurse-Midwives or Staff Nurses. The range of clients contacted per month (343) for Community Health Nurses was also higher than that for Nurse-Midwives (203) and Staff Nurses (135).

Table 6 Statistics of clients attended to per month by category of PHC providers

Clients receiving care	Category of service providers		
	Community Health Nurses	Nurse-Midwives	Staff Nurses
Mean	151.4	109.7	100.8
Standard deviation	71.3	75.9	48.7
Minimum	12	30	40
Maximum	355	233	175

4.2 Protocols and IEC Materials Accessibility

The summary findings on nutrition protocols and IEC materials accessible to service providers revealed that the mean of protocols was 2.83 and range was 4 whereas that for IEC materials was 3.17 and 5.The overall number of protocols accessible were put in two categories, thus, number of protocols greater than the mean was considered adequate and lower than the mean was considered inadequate. In all, 42.5% had access to inadequate protocols and 57.5% of services providers had adequate protocols. A Chi-Square test showed that the distribution of service providers in to the two categories was not significant.

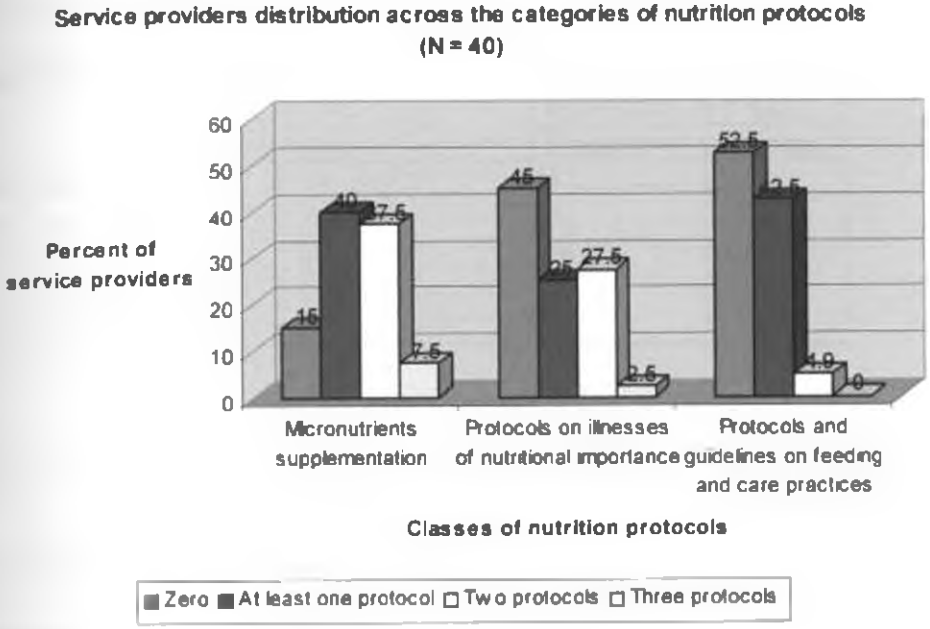
4.2.1 Classes of Nutrition Protocols Accessible to Care Providers

At least two classification criteria for nutrition protocols exist: One such classification criterion is based on the types of service contacts and the other, which is general, is based on each specific nutrition problems (Sanghvi, et al., 2004). The classification criterion used in the study differed slightly from that by Sanghvi et al. (2004). Here, protocols were classified in to three categories similar to that of Sanghvi, et al. But instead of by service contact types the classification was based on nutritional problems the protocols were intended to address. The three categories are: protocols on micronutrients supplementation, protocols on illnesses of nutritional importance and protocols and guidelines on feeding and care practices. Details definitions of categories are in operational definitions in page vii and viii.

Distributions of the three classes of protocols available and accessible to service providers in figure 5 depict that more than half (52.5%) of them lacked protocols and guidelines on feeding and care practices. Forty-two percent and only 4.9% had access to respectively one and two of the protocols on feeding and care practices. However, no service provider had access to three or more of the protocols and guidelines. A quarter (25%) of service providers had access to one protocol on management of nutritional illnesses whilst 27.5% and 2.5% respectively had access to two and three protocols on management of nutritional illnesses. Forty-five percent of service providers had no access at all to protocols on management of nutritional illnesses. Majority (40%) of service providers had access to one protocol on micronutrients supplementation. Two and three

protocols on micronutrients supplementation were accessible to 37.5% and 7.5% respectively but not accessible to 15% of service providers.

Figure 5



The distribution of nutrition protocols to service providers were found be significant with 15.05 ($p < 0.05$); 14.6 ($p = 0.002$); and 9.25 ($p = 0.006$) Chi-Square test statistics respectively for protocols on micronutrients supplementation; management of nutritional illnesses; and feeding and care practices.

4.2.2 Accessibility of Nutrition IEC Materials

The distribution of accessible IEC materials to service providers is shown in table 7. The table shows that 34.1% of service providers had access to three IEC materials. Less than ten percent of service providers had access to one IEC materials, whilst those accessing

to five or more IEC materials constituted 12.2%. A little more than a quarter (26.8%) had access to four IEC materials.

Table 7 Distribution of service providers by number of accessible IEC materials

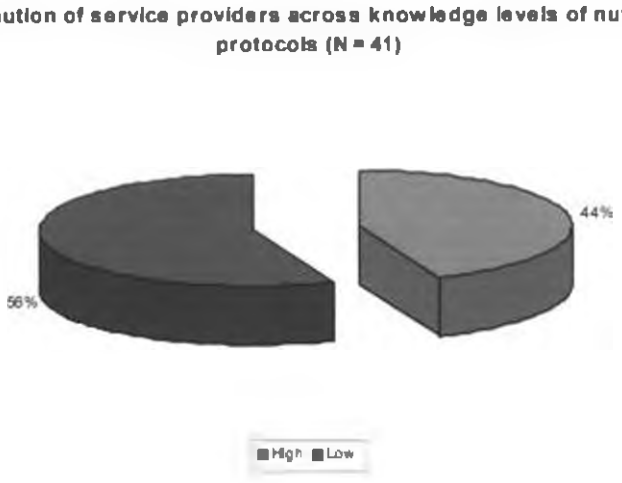
Accessible nutrition IEC materials	Proportion of service providers (N = 41)	
	Frequency	Percent
One IEC material	4	9.8
Two IEC materials	7	17.1
Three IEC materials	14	34.1
Four IEC materials	11	26.8
Five or more IEC materials	5	12.2

4.3 Service Providers Knowledge on Nutrition Protocols

Knowledge on nutrition protocols by service providers was analysed based on the minimum scores obtained by each service provider upon completion of knowledge questionnaires on nutrition protocols used in the delivery of MCH services. The mean protocol knowledge score was 15.1 points and ranged between 4.5 and 25.5 points.

Ranking the service providers in to either high or low knowledge based on their scores and cut-off points set, revealed that overall, 18 (44%) of service providers were in the high knowledge group, whereas 56% were in the low knowledge group. Figure 6 shows the distribution of service providers between the two ranks of nutrition protocols knowledge. A Chi-Square test showed that the difference in the distribution of service providers between the two knowledge levels was insignificant.

Figure 6



4.4 Quality of Nutrition Services

4.4.1 Nutrition Actions Assessed

Health service delivery contacts are periods during which mutual interactions occur between health service providers and clients of the services. Sanghvi et al. (2004) has categorized the types of service delivery contacts in to three namely: child health services contact: maternal health services contact (ANC) and both mother and child health services contact.

At least 17 specific nutrition action areas were assessed across these three types of service delivery contacts. The nutrition actions assessed in child health service contacts were:

- Routine growth monitoring and counselling (promotion),
- Routine child vitamin A status assessment and supplementation,

- Child feeding assessment and appropriate counselling,
- Preventive iron supplementation for children 6 months and above,
- Assessment for and appropriate management of other illnesses in sick children other than those associated with patients' complaints, and
- Assessment and counselling of caregivers on prevention or treatment of common childhood illnesses (malaria and/ or anaemia, diarrhoea, measles and ARIs).

For maternal health services contact:

- Distribution of iron and folic acid tablets and multivitamins to all ANC women,
- Appropriate counselling of ANC attendants on the benefits and side effects of the nutrition supplements,
- Appropriate counselling of ANC women on their nutrients needs and reduction of workloads,
- Assessment and treatment or prevention of malaria and or anaemia,
- Appropriate counselling of ANC women on preparation for delivery and breastfeeding, and
- Appropriate family planning counselling.

For mother and child health services contact:

- Observing and counselling women on appropriate infant feeding (exclusive breastfeeding) and appropriate complementary feeding,
- Assessment and provision of vitamin A to each immediate postpartum woman,

- Appropriate counselling of postpartum women on their increased energy demands,
- Assessment and continuation of iron and folic acid supplementation for women who did not complete intakes protocols during pregnancy,
- Counselling each woman on family planning and available methods.

4.4.2 Nutrition Supplies Availability

The types and amounts of the different nutrition supplies required depend on the type of service contacts and average number of clients per contact. Typical nutrition supplies required during MCH service delivery include iron and folic acid tablets, vitamin A capsules, oral re-hydration salts, antihelminths drugs and multivitamins. Others are drugs for prevention and treatment of malaria, and equipments or materials for estimating blood haemoglobin levels in pregnant women. Table 12 shows statistics of the amounts of vitamin A and antihelminths drug supplies required, and amounts that were available. Also, figures 10a and 10b are scatter plots of the supplies available against average number of clients. No single health facility however had on hand, oral rehydration salts.

Table 8 shows that the mean and highest amounts of vitamin A supplies available were beyond recommended. However, the mean amount of antihelminths drugs available was lower than recommended. These statistics do not clearly assess on the adequacy of availability of the amounts of supplies. Nevertheless, their distributions distributions revealed they were significantly different from normal at the service delivery sites since the skewness values for each was greater: 1.88 and 3.52 for vitamin A and antihelminths

respectively than 1. Figures 7a and 7b demonstrate non-linearity in the distribution of supplies shown by the two scatter plots. This means the distribution of nutrition supplies was not uniform according to numbers of clients visiting the service delivery points.

Table 8 Statistics of nutrition supplies availability and amounts recommended

Nutrition supplies availability	Supplies type			
	Vitamin A capsules		Antihelminths drugs	
	Available	Recommended	Available	Recommeded
Mean	94.18	64.32	25.92	75.68
Standard deviation	125.81	34.59	55.68	38.96
Minimum	0.00	10.00	0.00	12.00
Maximum	580.00	180.00	300.00	216.00

Figure 7a Scatter plots of vitamin A supplies available against number of clients (children)

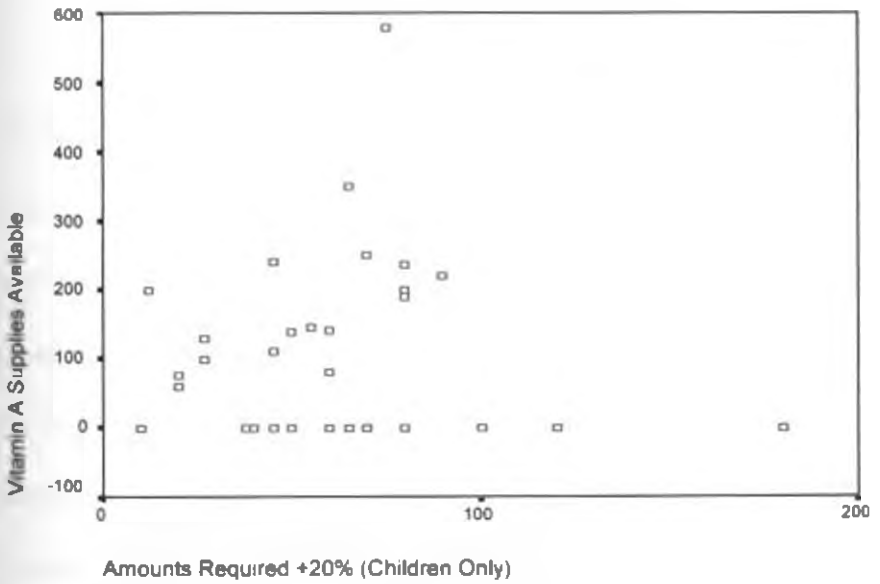
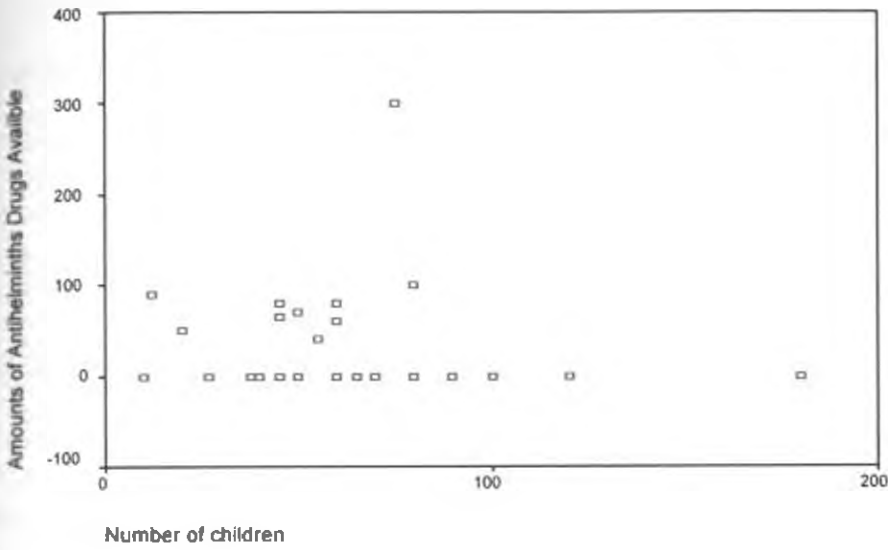


Figure 7b Scatter plot of antihelminths drugs available against number of clients contacted



4.4.3 Nutrition Supplements Distribution

An assessment of the 41 service providers revealed that 34 had vitamin A capsules and antihelminths drugs supplies on hand. Nevertheless, less than a quarter 8 (23.5%) of those who had vitamin A capsules did not carryout assessment of clients' vitamin A status and supplementation. Also, no single health service provider among those who had antihelminths drugs on hand, assessed their clients' in order to deworm them as recommended.

Exit interviews conducted on 63 pregnant women who visited facilities for ANC servi revealed that 57% and 66.6% of pregnant women received iron and folic acid tabl respectively according to protocols. However, none of the service providers record amounts of supplies given to clients in their cards. This was necessary to keep track how many supplements each woman had received since her first ANC visit. The rest the 43% and 33.4% of the clients assessed, did not receive the tablets according protocol.

4.4.4 Nutrition Supplements Intake Side Effects Management

Side effects of nutrition supplements (micronutrients) intakes compel pregnant wom full compliance with protocols. An assessment of how MCH service providers handl women who presented supplements side effects complaints are shown in table 9.

Table 9 Advice given to ANC clients on supplements side effects

Advice given to clients	Proportion of service providers (N = 41)	
	Frequency	Percent
Suggest alternative times for intakes	10	24.4
Prescribe close-substitutes	7	17.1
Stop intakes with no substitutes	8	19.5
Stop and improve diets	6	14.6
Give encouragements only	10	24.4

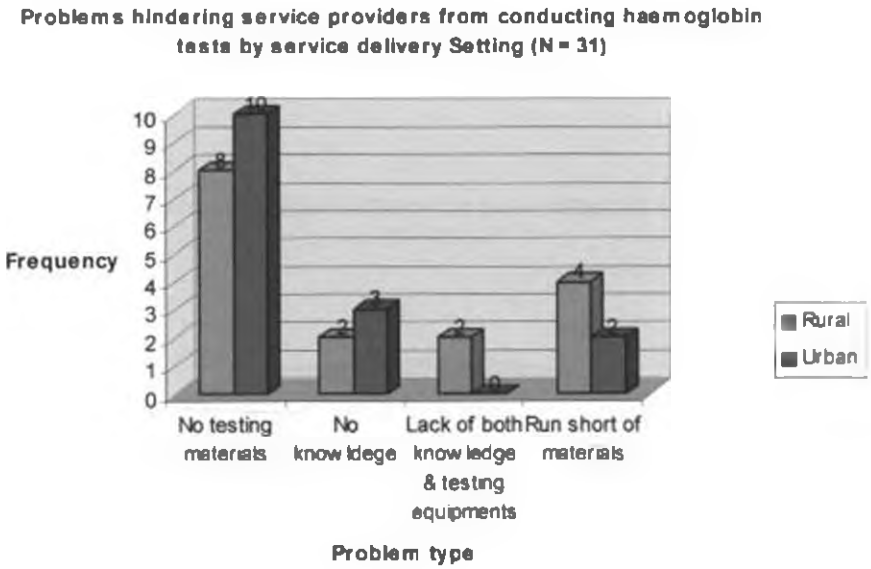
4.4.5 Haemoglobin (Hb.) levels estimation

The prevention and management of anaemia among women during pregnancy is essent in enhancing the health and survival of mothers and their infants. Assessment for anaem and/ or malaria and treatment requires, in addition to physical examination of clients, t

estimation of haemoglobin levels. This is important to guard against the development of anaemia and subsequent progression to the severe form. The study finding show that less than a quarter 10 (24.4%) of the 41 service providers interviewed had conducted haemoglobin tests on their ANC clients.

Figure 8 is the distribution of the problems that prevented service providers from performing blood haemoglobin level tests on ANC women. In all, a higher proportion of 16 (51.6%) of service providers were not performing haemoglobin level tests in rural areas compared to 15 (48.4%) in the urban.

Figure 8

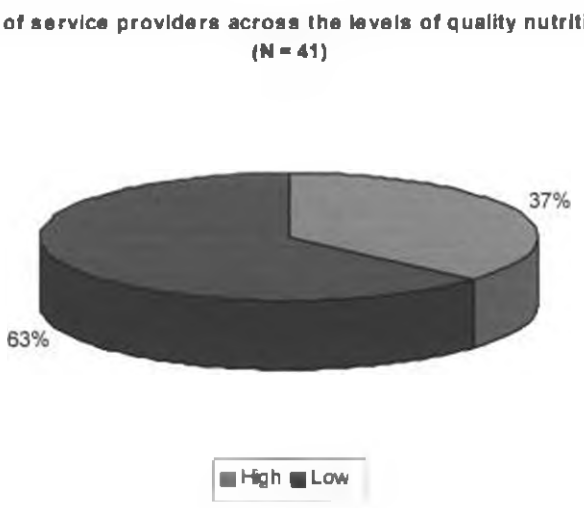


Adequacy of nutrition services was determined based on scores obtained by service providers using the scoring scale in appendix 2 A. The mean score for nutrition service adequacy was 60. and the scores ranged from 35.41 to 80.84.

However, the mean score on quality of nutrition services was 62.49. with a range of 34 to and 91.67. The scores obtained by each service provider was used to classify him or her in to two rankings namely high or low quality services depending on whether the score was higher or lower than the mean score. In all. 63% of health service providers delivered low quality nutrition services.

A Chi-Square statistic test revealed that the observed difference in the distribution of service providers between the two levels of nutrition service quality was statistically insignificant.

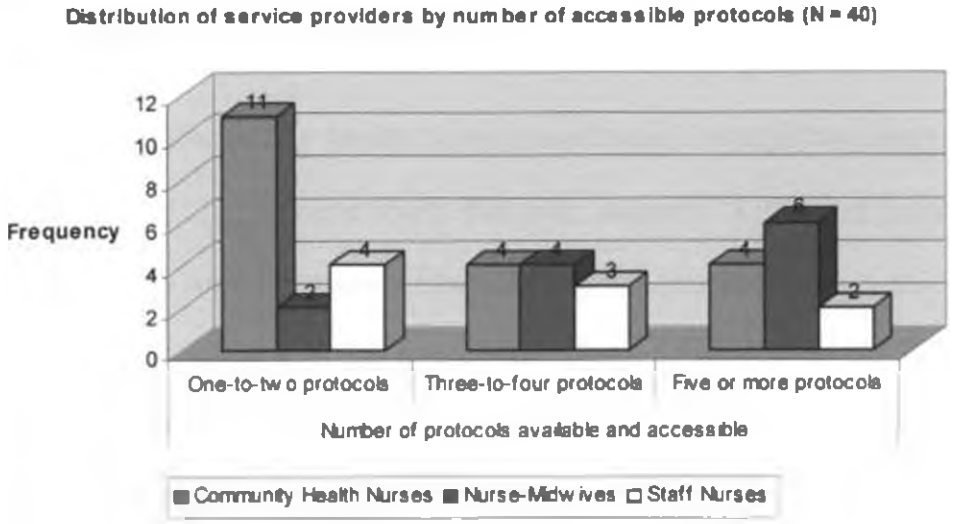
Figure 9



4.5 Categories of Service Providers and Accessibility to Protocols

The number of protocols accessible to service providers range from 1 to 4 for both Community Health Nurses and Staff Nurse, and 2 to 5 for Nurse-Midwives. The mean number of protocols accessible was higher (3.58) for Nurse-Midwives, whilst that for Community Health Nurses and Staff Nurses was 2.52 and 2.44 respectively. The distributions of service providers who had access to one-to-two, three-to-four and five or more protocols are shown in figure 10. Overall, 17 (42.5%), 11 (27.5%) and 12 (30%) of service providers respectively had access to one-to-two, three-to-four and five or more protocols. Majority (64.7%) of Community Health Nurses had access to one-to-two protocols whilst Nurse-Midwives and Staff Nurses were 11.8% and 23.5% respectively. Equal proportions (36.4%) of Community Health Nurses and Nurse-Midwives had access to three-to-four protocols whereas 27.3% were Staff Nurses. Among the service providers who had access to five or more protocols, Nurse-Midwives constituted 50%; and Community Health Nurses and Staff Nurses constituted 33.3% and 16.75 respectively.

Figure 10



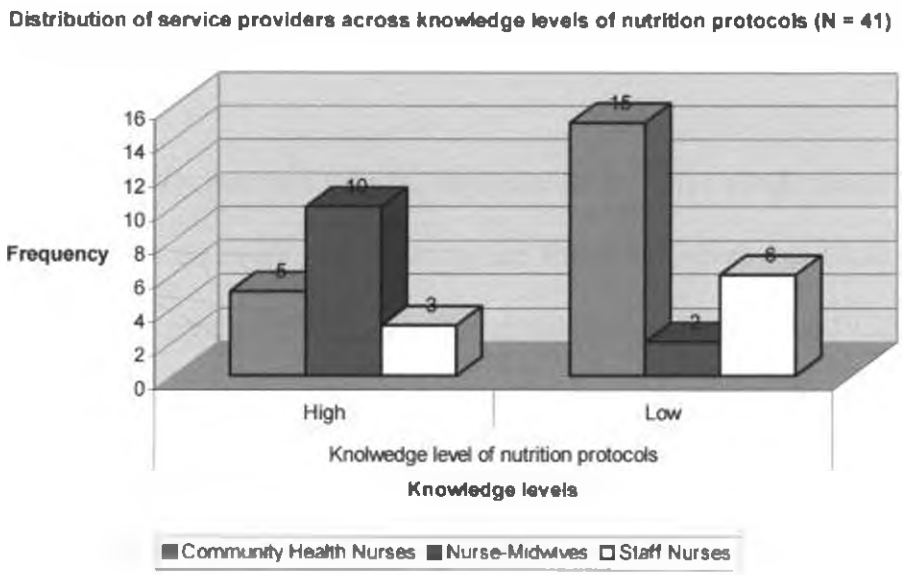
Cramer's V and Contingency Coefficient tests have both indicated insignificant association between the categories of service providers and numbers of nutrition protocols available and accessible to them.

4.6 Category of Service Providers' and Knowledge on Protocols

Among the three categories of service providers assessed, 12 were Nurse-Midwives, 20 Community Health Nurses and 9 Staff Nurses. Summaries on knowledge scores of nutrition protocols revealed that Nurse-Midwives had the highest mean knowledge score 20.6 points, whilst those for Community Health Nurses and Staff Nurses were 13.2 points 12.2 points respectively. The minimum knowledge score for Nurse-Midwives was 12.0 points whereas that for Community Health Nurses and Staff Nurses was 6.2 and 4.5 points respectively. The maximum knowledge scores were 25.5, 22.5 and 19.5 points respectively for Nurse-Midwives, Community Health Nurses and Staff Nurses.

The distribution of service providers' across protocols knowledge levels showed that more (55.5%) of Nurse-Midwives constituted the high knowledge group. The proportions of Staff Nurses and Community Health Nurses constituting the high knowledge group were 3 (16.6%) and 5 (27.7%) respectively. However, majority 15 (65%) of those in the low knowledge group were Community Health Nurses whereas Staff Nurses and Nurse-Midwives were 6 (26%) and 2 (8.7%) respectively. Figure 11 depicts the distribution of the three categories of service providers between the two levels of nutrition protocols knowledge. A Likelihood ratio test was significant producing 11.463 ($p = 0.003$) Chi-Square statistic indicating a high significance in the distribution of the categories of service providers across knowledge levels of nutrition protocols.

Figure 11



4.7 Association of Service Providers' Knowledge with Quality of Services

A cross tabulation between service providers knowledge levels and quality of nutrition services depicted that more than half (72.2%) of the high knowledge group of service providers delivered high quality nutrition services and 27.7% delivered low quality nutrition services. About 91% of the low knowledge group delivered low quality services whereas less than ten per cent (8.7%) delivered high quality services.

Since knowledge and quality levels of nutrition services are composite, ordinal and categorical variables, the appropriate correlation test performed was Somer's d test. The test produced a coefficient of 0.635 ($p < 0.05$), confirming significant correlation between service providers' knowledge level of protocols and quality levels of nutrition services.

4.8 Association of Service Quality with Category of Service Providers

Assessment of the quality nutrition services delivered by the three categories of service providers revealed that the mean quality scores for Nurse-Midwives was 68.13 with a range of 44.69 to 91.67 points. The mean for Community Health Nurses was 59.25 with a range of 34 to 83.07 points whereas that for Staff Nurses was 62.19 and ranged from 40.11 to 84.54 points.

A cross tabulation between the categories of service providers and quality levels of nutrition services showed that Nurse-Midwives constituted a higher proportion (66.7%)

of those who delivered high quality nutrition services. The proportions of Staff Nurses and Community Health Nurses who delivered high quality nutrition services were 33.3% and 20% respectively. Eighty percent of Community Health Nurses delivered low quality services on the other hand 33.3% and 66.7% respectively of Nurse-Midwives of Staff Nurses delivered low quality services.

Two appropriate correlation tests (Kendal's tau_b and Spearman's rho) were performed to determine associations between the categories of service providers and quality of nutrition actions. These two tests determined the correlation at the interval levels of service providers and rank orders of quality. However, both tests found no significant correlation between service providers, Community Health Nurses, Nurse-Midwives and Staff Nurses on one hand and rank orders of nutrition service quality.

4.9 Years of Practice and Quality of Nutrition Services

In table 9 the proportion of service providers who delivered low quality nutrition services increased for those who practiced for less than 12 years, compared to those who practiced between 12-24 years, but remained the same for those who practiced for more than 24 years. However, the distribution patterns of service providers across the stratums of years of practice have been non-uniform.

Table 10 Service providers' years of practice and quality of nutrition services

Service providers years of practice	Quality level of nutrition services				
	High		Low		Total
	Frequency	Percent	Frequency	Percent	Percent
Less than 12 years	4	9.76	9	21.95	31.71
Between 12-24 years	2	4.88	12	29.27	34.15
Above 24 years	9	21.95	5	12.20	34.15

A correlation test (Spearman's rho) gave a correlation coefficient of –0.405 ($p = 0.009$), indicating very high significance between service providers' years of practice and quality.

4.10 Differences in Quality of Service at Urban and Rural

A comparative analysis between nutrition service quality differences and the delivery settings (urban and rural) was done to determine any differences between the two settings. Summary statistics of quality nutrition service scores at the urban and rural facilities show that the means of quality nutrition service scores were 60.93 and 64.14 points. The scores ranged from 34 to 91.6 at the urban and 45.29 to 84.47 points in the rural areas.

A cross tabulation between the service delivery settings and quality of nutrition services revealed that overall, 48.8 and 51.2% of service providers respectively delivered high and low quality nutrition services. A smaller proportion (47.6%) of service providers in the urban delivered higher quality services 50.0% than in the rural setting. That is, more service providers in the rural setting performed better than their urban counterparts. A Chi-Square test revealed that the observed difference in quality service delivery between the urban and rural settings was statistically insignificant.

4.11 Factors Hindering Use of Nutrition Protocols

A number of service providers' faced problems in the use of nutrition protocols during MCH services delivery. In all, 10 (24.4%) of the 41 service providers sampled reported having problems in applying protocols in service delivery. Findings in figure 12a show that on a whole 9 (90%) of service providers at rural health facilities encountered protocol problems than in urban areas. A Likelihood Chi-Square ratio test produced a statistic value of 10.659 and a significance (p- value) of 0.001, confirming significance of association between service delivery setting and problems protocols application during service delivery.

Figure 12a

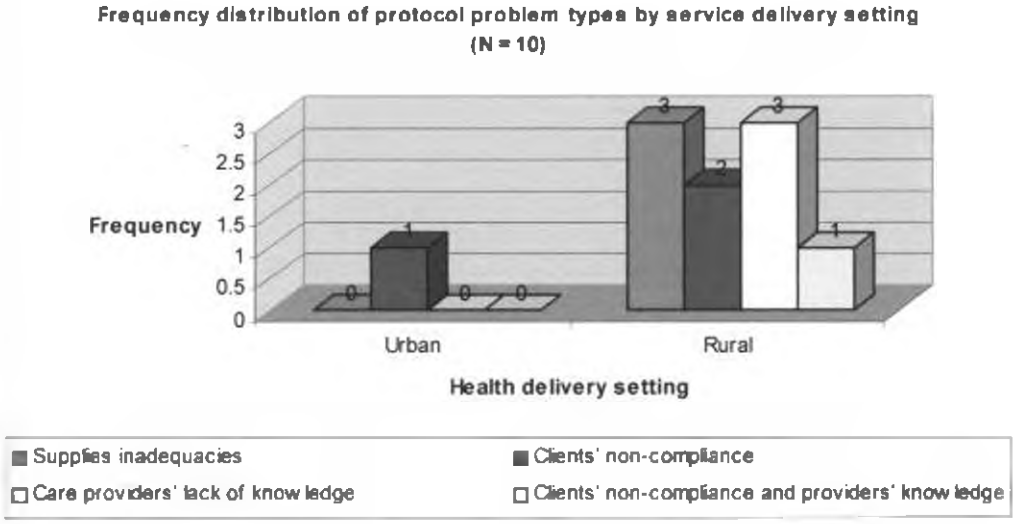
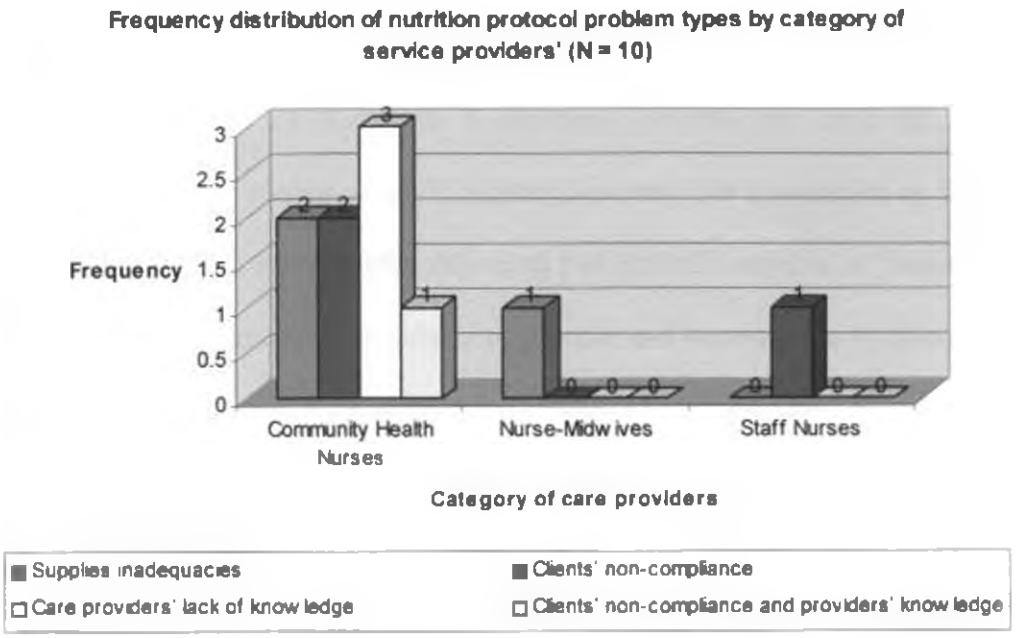


Figure 12b


Frequency distribution of nutrition protocol problem types by category of service providers' (N = 10)
Frequency
3
2.5
2
1.5
1
0.5
0
Community Health Nurses
Nurse-Midwives
Staff Nurses
Category of care providers
Supplies inadequacies
Clients' non-compliance
Care providers' lack of knowledge
Clients' non-compliance and providers' knowledge

CHAPTER FIVE

5.0 Discussion

The main objective of the study was to determine maternal and child health (MCH) service providers' knowledge of nutrition protocols and how it impacted on the quality (adequacy) of nutrition services they deliver as part of MCH services in Tamale, Ghana. Quality services meet technical standards of practice and expectations of clients. Service quality determinants are the providers' knowledge of protocols and guidelines, which specify the amounts of supplies required, for whom, when and at what age.

Service providers' knowledge on protocols and guidelines are determined in part by their level of exposure to these service delivery protocols; information and training; and length of practice. Thus, accessibility of service protocols to service providers have important bearing on their knowledge, and thus the service quality, and hence the study objective on protocols accessibility to service providers.

Differences in service quality often exist between urban and rural settings, due to several factors such as inappropriate distributions of supplies and equipment. These factors contribute to hindering service providers from adhering to service delivery protocols and guidelines. Since protocols determine the types and amounts of supplies required for each problem situation, even if service providers have the knowledge, problems of supplies may still hinder services providers from adhering to protocols and guidelines. Therefore, the study was to determine factors that hinder use of protocols, and generate ideas on improving and/ or strengthening nutrition as part of MCH services stated sub-objectives

(e) and (g). Information about the level of service quality does not only emanate from amounts of supplies and equipments available, but also from the determination of the extent to which services meet clients' needs and expectations. Therefore, feedback responses (perception) from clients were important in determining whether the services were of the quality that clients expected

5.1 Protocols and IEC Materials Accessibility

Several of the nutrition protocols applied in MCH services can be memorized with relative ease and others are available in health cards of clients. Many still exist that service providers need to carry and/ or display, for instance, protocols in training manuals and those that carry information, education and communication messages.

The study found that on average, Community Health Nurses had access to the least variety of nutrition protocols, and yet they served larger numbers of clients than both Nurse-Midwives and Staff Nurses. Since they were the majority in the rural health facilities, this could explain the lower protocols accessibility in the rural setting. This observation agreed with that made in KSA (2004) and Bahl and Trakoo (1996). This can be explained by the fact that delivery of health in many rural areas in Tamale takes place under sheds (trees) or community meeting grounds. These are not appropriate places for keeping service resources including protocols and IEC materials, a probable cause of the lower availability and accessibility to service providers in the rural setting. However, health delivery points in the urban areas were found to be permanent structures owned by

the health care system, and hence supplies including nutrition protocols and IEC materials could be safely kept and/ or displayed.

5.2 Service Providers Knowledge on Nutrition Protocols

The study found that Nurse-Midwives had the highest mean knowledge score and also formed a higher proportion (60%) of the high knowledge group of service providers than Community Health Nurses and Staff Nurses. Differences in the numbers of in-service trainings received and service providers' years of practice have influence on service providers' knowledge on protocols. The fact that Nurse-Midwives had the highest mean years of practice, and this could have afforded them a greater exposure to many protocols compared to Community Health Nurses and Staff Nurses. Also Nurse-Midwives constituted a higher proportion of service providers who participated in more in-service trainings, which could have influenced positively their knowledge on protocols. The observed difference in knowledge levels of the categories of service providers' was similar to the findings by Bahl and Trakoo (1996).

The fact that more than half (72.2%) of the high knowledge group of service providers offered high quality nutrition services compared to less than ten percent (8.7%) of the low knowledge group who delivered same quality services clearly demonstrate the impact of protocols knowledge on quality service delivery. This is because, knowledge determines the nutrition supplies or materials required during each nutrition problem situation, amounts to be given to clients and counselling to give. The finding that MCH service providers' knowledge of protocols had significant influence on the quality of

nutrition services in the study contradicts a similar study finding by Soguel et al. (2005) in which they concluded that knowledge of protocols alone was not a sufficient support to delivery of quality services by primary health care providers.

The study also found that more than half (70.7%) of service providers delivered adequate nutrition services. This high proportion of service providers delivering adequate services sharply contradicted Agrawal, Tandan, and Srivastava (1994) findings. The service providers' knowledge of protocols and adequacy of nutrition services cross tabulation showed that higher proportion (88.8%) of the high knowledge group delivered adequate nutrition services, and more than half (56.5%) of the low knowledge group also delivered adequate services. This would imply that, even with little knowledge of protocols, service providers are able to choose and give the right amounts of nutrition supplies, information and education to clients.

5.3 Quality of Nutrition Services

Nutritional care that meets acceptable technical standards as well as needs and expectations of clients and communities is high quality care. Quality nutrition actions embody adequacy, which includes amounts of supplies available and amounts given to clients according to protocols, as well as the content of information and education (counselling) given to clients following guidelines and protocols.

The study found that more than half (63%) of service providers delivered low quality nutrition services. Nevertheless, over half (56%) of them had high knowledge of nutrition

protocols, a similar observation made in KSPA (2004). This is attributable to human elements such as service providers' attitudes and poor supervision and problems of supplies inadequacies. The study also found that Community Health Nurses scored high in terms of protocols knowledge. Nevertheless, they performed poorly in quality service scores. This could be attributed in part, to the higher number of clients they served compared to Staff Nurses.

Delivery of quality nutrition services correlated negatively with service providers years of practice, which implied two possibilities. The first and most probable is that quality of nutrition services correlated with service providers' years of practice in a non-linear fashion as seen in the irregular patterns of the distribution of service providers across years of practice. The second scenario is that quality of nutrition services may have inversely correlated with service providers' years of practice.

5.4 Differences in the Quality of Nutrition Services

The study observed that more than half of service providers at both rural and urban health facilities delivered low quality nutrition services. However, the proportion of service providers who delivered low quality nutrition services in the rural was much higher (70%) than in the urban (57%). These differences in service quality observed between the urban and rural health facilities conformed to findings by Chowdhury, Bhuiya et al. (1999).

Problems of resources (supplies, equipment or materials including personnel) were common experiences in rural areas as compared to their urban counterparts. Further more, the fact that service providers at the rural areas attended to larger numbers of clients as revealed in the study, leads to less contact time service providers would have for each client, thus, resulting in the neglect of some essential nutrition actions. This subsequently affects overall quality of services, as similarly observed by Chowdhury, Bhuiya et al. (1999).

The study also revealed that majority of service providers who encountered problems in the use of nutrition protocols were in the rural facilities. Many also mentioned lack of knowledge of nutrition protocols. These could be the probable reasons for the observed difference in service quality between the two settings. Also, the fact that many service providers in the urban had access to a wide range of nutrition service protocols than their rural counterparts may have contributed.

5.5 Factors Hindering Use of Nutrition Protocols

Some major factors found contributing to poor use of nutrition protocols in the delivery of services were inadequate nutrition supplies and equipments (30%). This observation of supplies and equipments problems conformed to KSPA (2004) survey findings. Other factors were service providers' lack of knowledge of nutrition protocols (30%), clients' non-compliance to management or treatment protocols (30%) and factors related to both supplies inadequacies and clients' non-compliance (10%). However, all (30%) of MCH service providers who reported supplies inadequacies and 20% of those who reported

clients' non-compliance were at rural health facilities. The 10% of MCH service providers who mentioned problems of both supplies and clients' non-compliance were in rural areas.

Apart from the 10% of MCH service providers who reported clients' non-compliance in the urban, the other 90% were service providers in rural health facilities where, majority (80%) were Community Health Nurses. All of the service providers who sited lack of nutrition protocols knowledge served in rural health facilities. They were also Community Health Nurses. The lower number of in-service trainings Community Health Nurses received coupled with the access to variety of protocols compared to Nurse-Midwives could explain their lower knowledge on protocols than the Nurse-Midwives.

5.6 Ideas Aimed at Improving Nutrition Services in MCH

Ideas generated from the study findings aimed at improving nutrition components in MCH services were:

Maintenance of uninterrupted supplies and equipment is critical to quality and efficient service delivery, since availability and access to adequate supplies and equipment was said to be a motivation factor for service providers;

There is the need for regular assessments of service providers' nutrition supplies needs, as part of supervisory activities is as important as the delivery of the services;

The need for information creation is eminent to enable sharing of technical information and/ or knowledge among services providers about evidence-based delivery practices;

The once monthly mobile community outreach services currently being practiced need to change so that service providers' visit each outreach point at least twice every month.

CHAPTER SIX

6.0 Conclusions and Recommendations

6.1 Conclusions

Conclusions drawn from the study findings were as follows:

Access to nutrition protocols overall, was adequate. However, there were disparities in their distribution among the different categories of service providers. For instance, Community Health Nurses had very limited access to a variety of nutrition action protocols, nevertheless, they served much larger client populations;

There was poor knowledge on nutrition protocols by service providers particularly Community Health Nurses, considering the fact that more than half of them had low knowledge.

There was wide spread delivery of poor quality nutrition services, since only a third of the service providers delivered high quality nutrition services

Quality of nutrition services delivered by service providers was not better at either the rural or urban health facilities than the other. In other words, there were differences.

Major contributory factors identified in the study that hindered service providers from using nutrition protocols were poor knowledge, nutrition supplies inadequacies and, equipment unavailability and clients' non-compliance to treatment protocols.

Many service providers' in the rural health facilities faced problems on knowledge and supplies inadequacies than their urban counterparts.

6.2 Recommendations

Based on the study findings the following recommendations were made:

1) Community Health Nurses need to be given higher priority in the distribution of protocols.

2) Distribution nutrition of supplies need to be consistently monitored at all service delivery sites using appropriate checklists on supplies,

3) There is the need for forums to be created during which service providers' would meet to share information and knowledge and discuss ways to improve service delivery.

4) Community Health Nurses knowledge on protocols should be enhanced by given higher priority to them in any in-service trainings.

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Appendixes

Appendix 1 Questionnaires

Section 1

Demographic characteristics of health care providers

Questionnaire no..... Field assistant ID: ..... Date of interview: ..... //.. ... //.. ...
dd mm yy

Name of health facility/ out reach point (Community/ Village): .....

Name of health provider: ..... Years of experience: .....

Category of care provider: 1. [] Community Health Nurse 2. [] Midwife 3. [] Staff Nurse

Type of service contact 1. [] MCH (General) 2. [] RH/ANC/ FP 3. [] Child health only

Section 2

Nutrition supplies, protocols and IEC materials availability

1. Indicate below the following supplies available for today's service.

Supply	Quantity available
Iron tablets	
Vitamin A	
Mebendazole (dewormer tablets)	
IPT drugs (Chloroquine tablets)	
Folic acid tablets	
ORS	

2. State your expected numbers for today's' service for the following clients?

1. Lactating mothers..... 2. Pregnant women..... 3. Children.....

3. Indicate below the IEC materials on nutrition counselling available

IEC counselling material type	No.
1.	
2.	
3.	

4. Did you receive any supervisory visit within the last three months at your outreach?
Yes [] No. []

Section 3

CARE PROVIDERS' KNOWLEDGE AND APPLICATION OF NUTRITION ACTION PROTOCOLS

8. Mention any nutrition protocols you know and use in your service delivery

1.....
2.....
4.....
5.....

9. For each nutrition protocol mentioned in 8, state the contact point(s) for its application and supplies and or materials required

Service protocol	Contact point	Supplies/materials/ equipments required
1. 2. 3. 4. 5.		

10. Do you have any special problems in applying nutrition action protocols?

Yes [] No. [] **(If yes answer 11, otherwise go to section 4)**

11. Which are they?

Contact point	Service protocol	Problem(s)

Section 4

NUTRITION ACTIONS IN MCH CARE SERVICES

11. Which essential nutrition actions do you carry out for mothers/ caregivers of young children during your contact with them?

1. [] Breastfeeding counselling [] 2. Food and hygiene [] 3. Assess children vitamin A status 4. [] Family planning counselling (birth spacing) [] Other (specify).....

12. Which essential nutrition actions do you emphasize when counselling mothers/ caretakers of sick children below six months?

1. [] More frequent feeding 2. [] Advice on exclusive breastfeeding [] 3. Advice to seek health from trained personnel 4. [] Other(specify).....

13. What do you ask for when assessing the feeding of infants and young children?

1. [] What child is fed on 2. [] What food is available 3. [] What food is affordable to caretaker 4. [] Time spent in feeding child 5. [] Approach of feeding

14. Indicate in table below which nutrition supplies you give to children during sickness

Item (drug/ capsule)	Qty./ amount	Type of illness
1. 2. 3. 4.		

15. How do you counsel the caretaker of a child suffering from diarrhoea?

Children below six months	Children above six months
....	....

Section 5

NUTRITION ACTIONS IN ANTENATAL SERVICES (ANC)

16. How do you counsel pregnant women on intakes of nutrition supplements (iron/ folic acid tablets) to ensure compliance? .....

.....

17. Do you receive complaints on side effects from clients? Yes [] No []

(If yes to 16, answer 18 and 18 otherwise go to 20)

18. Which are they?..... .....

19. How do you help such women manage the effects at home?

.....

.....

20. Have you had any training in methods that include the following: 1. [] Preventive iron/folate supplementation 2. [] Anaemia assessment and treatment 3. [] Postpartum vitamin A supplementation 4. [] Breastfeeding counselling 5. [] Dietary needs for pregnant and lactating women [] for the last 3 years?

21. Do you conduct haemoglobin tests on pregnant women? 1. Yes [] No [].

(If no answer 22, and if yes go to 23)

22. Why don't you conduct the tests? 1. [] No knowledge 2. [] No equipments

3. [] Both 1&2 4. [] Other (specify).....

23. Do you have monthly reporting forms where you record information on nutrition supplements provided to your clients? 1. [] Yes 2. [] No.

SECTION 6

OBSERVATIONAL ACTIVITIES

CHILD HEALTH SERVICES

Does the counselling entail?

1. Feeding frequency Yes [] No. []
2. Quantities of food per meal Yes [] No. []
3. Form of food Yes [] No. []
4. Psychological attention to enhance appetite of child yes [] No []

2. What has the caretaker been counselled on about the sickness of less than six months old on child?

.....

4. Does she check the cards of healthy children for vitamin A status and give according to protocol? Yes [] No. []

5. Does she appropriately interpret the child's weight to mother/ caretaker?

Yes [] No. [].

6. Has she counseled caretakers on family planning and birth spacing?

Yes [] No. []. **(If yes)**

7. Are there some nutritional/ health benefits have been mentioned to the mother?

Yes [] No. []

MATERNAL HEALTH SERVICES (ANC)

1. Are women appropriately screened for anaemia and/ or malaria? 1. Yes [] 2. No []

2. Has haemoglobin test been conducted? 1. Yes [] 2. No []

a) 1st time visiting pregnant women? 1. Yes 2. [] No []

b) Those in their 36th week of gestation Yes [] No []

3.Have all woman been appropriately counselled using the right guidelines?

Yes [] No []

Appendix 2 Scoring scales on knowledge, quality and adequacy of nutrition services

A. Scoring scale on knowledge of nutrition protocols

Nutrition actions knowledge question answered	Scores
A mention of at least 1 nutrition protocol applied in MCH services	2
A mention of two nutrition protocols applied in MCH services	2
A mention of three MCH nutrition protocols	2
A mention of four MCH nutrition protocols	2
Care provider able to mention five or more nutrition protocols for MCH services	2
Sating correctly any contact point of application for 1 nutrition protocol mentioned	2
Stating correctly the service contact points for two nutrition protocols mentioned	2
Mentioning the contact points for three nutrition protocols mentioned above	2
Stating correctly the service contacts for any four nutrition protocols mentioned	2
Stating rightly the contacts points for five or more nutrition protocols mentioned	2
Correctly stating the nutrition supplies/ materials required in applying one protocol	2
Correctly stating the nutrition supplies/ materials in applying any two mentioned	2
Rightly mentioning the nutrition supplies/ materials for three of the protocols	2
Rightly mentioning the supplies for any four of the nutrition protocols	2
Rightly mentioning the supplies for any five or more of the nutrition protocols	2

B. Scoring scale on quality (adequacy) of nutrition actions

Service contact	Nutrition supplies	Score
Service protocols/ IEC materials availability	Availability of one to two IEC materials/ protocols	2
	Availability of three to four IEC materials/ protocols	2
	Availability of five or more IEC materials/ protocols	2
Child health service contacts	Vitamin A capsules available as per supplies needs for all clients	2
	Iron tablets/ syrups available as per supplies needs	2
	ORT salts available as per supplies requirements	2
	Drugs for worm control available as per protocol	2
	Drugs for management of malaria available as per supplies needs	2
Maternal health contact only	Iron tablets available to meet clients needs (attendance)	2
	Folic acid tablets available to as per protocol	2
	Equipments for estimating haemoglobin are available	2
	Drugs for treating worms are available as per protocol	2
	Drugs for treatment of malaria available as per protocol	2
Mothers & infants health contacts	Availability of at least one micronutrient supplement	2
	Availability of 2 nutrition supplements	2
	Vitamin A capsules available as per protocol	2
	Availability of 3 or more nutrition supplements	2
	Nutrition actions required	
Child health	Child's feeding is assessed	2

service contacts	Care taker is appropriately counselled about child's feeding	2
	Each child is weighed & mother counselled appropriately	2
	Every child's vitamin A status is assessed	2
	Each child assessed receives vitamin A according to protocol	2
	Family planning (birth spacing) is discussed with each woman	2
	Mothers are educated on their nutrition	2
	Opportunity is taken to discuss other nutrition/ health issues	2
	Sick children are assessed & treated for other illnesses as well	2
Maternal health contact (ANC)	Each woman receives iron/ folic acid tablets according to protocol	2
	Each woman receives counselling on benefits of supplements	2
	Each woman is counselled on compliance with intake protocols	2
	Each woman is informed of side effects of iron/ folic acid tablets	2
	Women are educated on management tablets side effects	2
	Each woman is assessed for anaemia	2
	Women diagnose of anaemia are treated accordingly protocol	2
	Haemoglobin levels are estimated for each woman	2
	Women experiencing side effects get appropriate counselling	2
Mother & infant health contact	Each lactating mother is assessed for vitamin A status	2
	Each woman receives a second dose of vitamin A based on protocol	2
	Infant's vitamin A status is assessed	2
	Infants requiring vitamin A receive according to protocol	2
	Sick infants receive correct nutrition supplements	2
	Each infant receives iron tablets for preventive treatment of anaemia	2
	Malnourished infants receive appropriate treatment	2
	Infants' feeding is assessed & mothers counselled correctly	2
Sub-total score (adequacy of nutrition actions)		**86**
	Care providers sort clients views on any nutrition/ health behaviour change issues	2
	Each contact opportunity is taken to discuss other nutrition issues with clients	2
	Clients are treated with respect or dignity & kindness	2
	Clients are treated as partners in the care	2
	Care providers together with clients schedule their next meeting	2
	High standards of clients privacy is maintained	2
Grand total on quality score		**98**

Appendix 3 Checklist on nutrition supplies for MCH in health centres/ clinics

Type of service contact	Supplies	Quantity for 100% coverage
Maternal only	**Pharmaceuticals:** a) Six months of daily tablets containing 60mg elemental iron and 400µg folic acid for women b) Haemaquines for estimating haemoglobin levels especially 1st visitors and 36th week	(180 per pregnant woman) multiplied by average number of ANC clients per month plus extra for severely anaemic
	c) Ant-malarial d) Antihelmintics/ worms	Based on prevalence of parasitic diseases in locality
	ICE materials and training materials: a) Posters or wall charts with 'Ten Steps (Breastfeeding in all maternities	Number of maternity or rooms used by postpartum women
	b) Breastfeeding counselling materials c) Job aids for staff on prenatal care, delivery/ postpartum care, and postnatal care	One per worker and supervisor
	d) Counselling cards or flip charts on key messages: iron intake compliance, diet. and **EBF; Key BF** message cards for maternity attendants and nurses	1 set per worker
	Recording and monitoring forms: a) Mothers health cards	Number of clients per month
	b) Supervisory checklist with nutrition interventions listed	Number of supervisors times average supervisions per quarter
Child health contact	a) Daily tally sheets to record vit. A caps, iron drops, and counselling given. b) Surveillance of severe malnutrition, VAD and anaemia	One sheet per day or outreach visit
	c) Oral rehydration salts d) Drugs for treatment of infections (amoxicillin, ampicillin, benzylpeniccillin, chloramphenicol, cotrimoxazole, gentamicin, metronidazole, and nalidixic acid e) Drugs for treatment of tuberculosis and other ARIs f) Drugs for treatment of helminths (albendazole, mebendazole, etc.) g) Drugs for treatment of malaria (chloroquine, pyremethamin plus sulfadoxin Weighing scales	Based on the prevalence in the catchment area Based on measles, diarrhoea and malnutrition morbidities A set for each worker One per room where sick/ well children are seen One per day

	h) Growth charts and tables of weight for height i) Drugs for parasitic control j) Iron drops for sick infants and young children plus extra for treatment of severely anaemic k) Vit A caps: 100,000IU and or 200,000IU for case management of measles, prolonged diarrhoea, malnutrition, infections l) Feeding assessment and counselling cards, flip charts for special feeding problems m) Measuring, weighing and recording needs: n) Weighing scales and growth charts o) Daily tally sheets to record vit. A, iron drops, and counselling given p) IEC and training materials: q) IMCI counsel cards for mothers, BF counselling materials for community based, clinic based, and immunization staff	One job aid per worker

Adopted and modified from: Sanghvi, Murray (2004).

Appendix 4 Nutrition protocols in maternal health services

A. Iron/ folic acid supplementation for pregnant women to prevent anaemia

All pregnant women who visit for ANC services

Prevalence of anaemia in the area during pregnancy	Dose/ day		Duration
	Iron mg	Folic acid µg	
< 40%	60	400	Six months in pregnancy (or if started late, extend to postnatal period for a total duration of six months)
> 40%	60	400	Six months in pregnancy (if six months not possible continue postpartum for a period of three months)
Adolescent girls & women			
➢ Not pregnant ➢ Pregnant	60 60	400 400	For high prevalence of anaemia

B. Protocol on malaria prevention in pregnancy (IPT)

Dose	Timing	Dosage
1st dose	After quickening (> 16 weeks gestation	3 tablets SP (Fansidar)
2nd dose	Not less than one month after the 1st dose	3 tablets SP (Fansidar)
3rd dose	Not less than one month after the 2nd dose	3 tablets SP (Fansidar)

C. Protocol on malaria prevention in pregnancy (chloroquine)

Timing	Dosage	Duration
First visit	4 tablets on day 1	3 days
	4 tablets on day 2	
	2 tablets on day 3	
Subsequent visits	2 tablets weekly	Throughout pregnancy till 6 weeks after delivery

D. Protocol on parasitic infection control in pregnancy

Drug	Dosage
Albendazole (zentel)	400mg single dose (give after 1st trimester only)
Mebendazole (vermox)	500mg single dose or 100mg x 2 daily for 3days after 1st trimester
Levamisole (Ketrax)	120mg single dose (3 tablets start 40mg each) after 1st trimester

(Source: GHS Anaemia in pregnancy prevention & treatment training manual 2004, for appendixes 2 A- D)

E. Diet during pregnancy and lactation

Nutrient requirements	Woman	Pregnant woman	Lactating women
Energy. kcals/ day	2,140	2,240	2,640
Handy measures equivalent to the above			
Cereal flour, rice	8 cups	8½ cups	11 cups
Beans and other legumes, etc.	3 cups	3 cups	3½ cups
Leafy vegetables	6 spoons	6½ spoons	9 spoons
Fruits and juices	½ cup	½ cup	½ cup

(Adopted from Sanghvi (1999) In: Nutrition Essentials A Guide for Health Managers

Appendix 5 Nutrition protocols in child health service contacts

A. Sick Child (Severe Measles) vitamin A supplementation

Vitamin A			
Form	Capsules		
	50,000IU	100,000IU	200,000IU
Frequency of dosage	Once daily for 2 days		
Age/ weight			
Up to 6 months	1	½	-
6-12 months	2	1	½
12 months up to 5 years	4	2	1

B. Protocol for vitamin A supplementation to healthy children

Vitamin A	
Form	Capsules
Frequency of dosage	Every 6 months
Age	
➢ < 6 months old children	50,000IU
➢ 6-11 months old	100,000IU
➢ 12-59 months old	200,000IU

C. Iron and folic acid supplements protocol on preventive iron deficiency anaemia

Age	Prevalence of anaemia in area	Dose/ day		Duration/ comment
		Iron (mg)	Folic acid (µg)	
6-24 months	Low/ high	12.5	50	From 6-12 months
				(From 2-24 months if LBW)
2-5years	High	20-30	0	Weakly dose possible
6-11 years	High	30-60	0	Weakly dose possible

Appendix 6 Protocols and Guidelines in both Maternal and Child Health Contacts

A. Steps to successful breastfeeding (Breastfeeding guidelines)

- Have a written breastfeeding policy that is routinely communicated to all health care staff.
- Train all health care staff in skills necessary to implement this policy.
- Inform all pregnant women about the benefits and management of breastfeeding.
- Help mothers initiate breastfeeding within one half-hour of birth.
- Show mothers how to breastfeed and maintain lactation, even if they should be separated from their infants.
- Give newborn infants no food or drink other than breast milk, unless medically indicated.
- Practice rooming in - that is, allow mothers and infants to remain together 24 hours a day.
- Encourage breastfeeding on demand.
- Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
- Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital (UNICEF 2001, LINKAGES/ USAID 2005).

B. Guidelines on Breastfeeding and HIV/ AIDS

For women of known HIV negative and for those with status is unknown, protect, promote and support exclusive breastfeeding for 6 months, followed by continued breastfeeding, together with appropriate complementary feeding, for up to two years of age or beyond;

All HIV-infected mothers should receive counselling, including information about the risks and benefits of various infant feeding options, and specific guidance in selecting the option most appropriate to their situation;

When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-positive mothers is recommended; otherwise, exclusive breastfeeding is recommended during the first months of life;

Assist HIV-infected mothers who are breastfeeding to ensure good breastfeeding techniques are adopted to prevent and treat harmful breast conditions;

Discontinue breastfeeding as soon as feasible and replace by appropriate feeds;

HIV-infected mothers who breastfeed should be provided with specific guidance and support when ceasing breastfeeding to avoid harmful nutritional and psychological consequences and to maintain breast health;

When HIV-infected mothers choose not to breastfeed from birth or stop breastfeeding later, they should be provided with specific guidance and support for at least the first 2 years of the child's life to ensure adequate replacement feeding; and

HIV-infected women should have access to information, follow-up clinical care, and support, including family planning services and nutritional support (WHO 2002, UNICEF 2001).

Appendix 7 Training curriculum matrix for Field Assistants

Topic	Mode of delivery	Materials required
1. Introductory discussion	A participatory discussion	Visuals, pens, pencils, notebooks
2. General activities of MCH care providers	Participatory	Pens, note books
3. Essential contact points between MCH care providers and clients	Pre-tests followed by a participatory discussion	Flip charts, posters, flyers
4. Categories of MCH service clients	Questions and answers and facilities visits	MCH service personnel
5. Nutrition actions during MCH contacts	Lectures, participative discussions	Nutrition protocols, guidelines, posters, laminated cards
6. Types of nutrition supplies and requirements for MCH services	Display of the nutrition supplies, their names, uses, what they do/ meant to treat	Drugs/ supplements, infant and MCH nutrition/ IEC materials
7. Data collection observation and interviewing techniques	Lecture and participatory discussions	Checklists, structured observation guides, questionnaires, pencils, erasers
8. Recording/ note taking	Demonstrations	Pens, pencils, erasers