AN ASSESSMENT OF THE EFFECTIVENESS OF GROWTH MONITORING AND PROMOTION PRACTICES WITHIN THE LUSAKA URBAN DISTRICT OF ZAMBIA

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Submitted in fulfilment of the requirements of
Master of Science in Nutrition and Dietetics
University of Cape Town
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Signature

Date
DEDICATION

To my late father, Michael Kawana Mwita, for the guidance he gave me which has always steered me in the right direction.

To my late brother and sister, Vincent Mwita Kawana and Regina Mwangala Kawana, for the precious moments we shared together.

To my sickly mother, Christine Mukalwizi Mampi Kawana, I will make up for the time I was not with you mum.
ACKNOWLEDGEMENTS

A number of people contributed in various ways to the research and gave me the impetus to hang on at the point when I could have given up.

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Beatrice Mazinza Kawana  
University of Cape Town, 2003
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<td>BASICS</td>
<td>Basic Support for Institutionalizing Child Survival</td>
</tr>
<tr>
<td>BAZ</td>
<td>Breastfeeding Association of Zambia</td>
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<tr>
<td>BFHI</td>
<td>Baby-Friendly Hospital Initiative</td>
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<tr>
<td>CBGMP</td>
<td>Community-Based Growth Monitoring and Promotion</td>
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<tr>
<td>CBoH</td>
<td>Central Board of Health</td>
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<tr>
<td>CHW</td>
<td>Community Health Worker</td>
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<tr>
<td>CHP</td>
<td>Child Health Promoter</td>
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<tr>
<td>EBF</td>
<td>Exclusive Breastfeeding</td>
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<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
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<tr>
<td>GMP</td>
<td>Growth Monitoring and Promotion</td>
</tr>
<tr>
<td>GOBIFFF</td>
<td>Growth monitoring, Oral rehydration, Breastfeeding, Immunization, Family planning, Female education and Food supplements.</td>
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<tr>
<td>HAZ</td>
<td>Height-for-Age Z-score</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>INP</td>
<td>Iringa Nutrition Project in Tanzania</td>
</tr>
<tr>
<td>JICA</td>
<td>Japanese International Corporation Agency</td>
</tr>
<tr>
<td>LDHMB</td>
<td>Lusaka District Health Management Board</td>
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<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
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<tr>
<td>MOST</td>
<td>Micronutrient Opportunities Strategies Technology</td>
</tr>
<tr>
<td>MUAC</td>
<td>Mid-upper-arm circumference</td>
</tr>
<tr>
<td>NCHS</td>
<td>National Centre for Health Statistics</td>
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<tr>
<td>NGM</td>
<td>Non-Growth Monitoring Package</td>
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<tr>
<td>SD</td>
<td>Standard Deviation</td>
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<td>TINP</td>
<td>Tamil Nadu Integrated Nutrition Programme in India</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>UPGK</td>
<td>Family Nutrition Improvement Programme in Indonesia</td>
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<tr>
<td>WAZ</td>
<td>Weight-for-Age Z-score</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WHZ</td>
<td>Weight-for-Height Z-score</td>
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ZDHS  Zambia Demographic and Health Survey
ZEBS  Zambia Exclusive Breastfeeding Study
DEFINITIONS

Adequate weight gain: This is when a child has gained weight between two serial weights and the child’s growth curve is parallel to or exceeds the slope of the reference curve.\textsuperscript{1,2}

Age: This was calculated from the date of birth as indicated on the Road to Health Card or as confirmed verbally by the mother/caregiver.

Anthropometry: The study and technique of taking body measurements, especially for use on a comparison or classification basis.\textsuperscript{3}

Community Health Worker: A cadre from the community who has basic training in primary health care promotion and who is able to handle the prevention and basic treatment of illness at the community level. Under the GMP programme these are sometimes called Child health promoters or Nutrition demonstrators depending on the term preferred.

Complementary feeding: This is the period during which other foods or liquids are provided to the child along with breast milk.\textsuperscript{4}

Complementary foods: These are solid foods that are given to a child during the period of complementary feeding and excludes breast milk.\textsuperscript{4,5}

Exclusive Breastfeeding: This is when a baby is exclusively fed on breast milk only, without giving water or any drinks, other foods and medicines unless medically indicated for a period of between 4-6 months. During this period breast milk is considered to be sufficient to meet all the nutritional needs of the baby.\textsuperscript{1,4,5}

Exclusive replacement feeding: This is when the baby is given alternative feeds only such as formula and no breast milk. The stopping of breastfeeding can be immediately after birth or within the first 6 months of baby’s age.
Focus Group Discussion: Bringing together a small group of people to participate in a carefully planned discussion on a defined topic to make use of group interaction to produce data and insight.6,7

Road to Health Card: A card that is usually used to record a child’s weight-for-age in months. It includes a growth chart typically used by mothers and health workers to determine if a child is experiencing normal or abnormal weight gain.3

Growth faltering: A condition identified by failure to gain adequate weight for one’s age between two serial recordings, signified by no change or an actual decrease in measurement.1,2,3

Growth Monitoring and Promotion: The practice of following changes in a child’s physical growth and development by regular measurements of weight and sometimes of length with accompanying information to guide the mother/caregiver’s nutritional and related care so as to detect health problems early. Growth monitoring and promotion is easier defined in two parts as growth monitoring and growth promotion: -

Growth Monitoring: The regular weighing and plotting of child’s weight on the growth card to decide if the child is gaining enough weight or not.1,2

Growth Promotion: Refers to the positive actions that are taken including counselling to ensure that children are growing well.1,2

Height-for-age: This index expresses the height of a child in relation to his age and reveals stunting at a given age. For children below 2 years of age, the index is referred to as length-for-age.3,8,9

Kwashiokor: A condition characterized by weight-for-age between 60 - 80 percent expected weight with oedema, particularly of the legs and dorsum of the feet. Associated signs are hair changes, skin lesions and depigmentation, apathy, misery and irritability.9

Malnutrition: This is when there is poor nutritional status resulting primarily from dietary intake either above or below the required amounts and or disease.
Marasmus: A condition that arises from prolonged starvation and is characterised by severe wasting of fat and muscle with weight-for-age < 60 percent expected.\textsuperscript{9}

NCHS reference standards: Growth percentiles developed by the National Centre for Health Statistics in the USA that provide standards for weight-for-age, length-for-age and weight-for-length/height. They are recommended by the WHO in the evaluation of nutritional status worldwide based on the anthropometry of American children.\textsuperscript{3,10,11}

Percentiles: Refers to an individual's relative location/position in comparison to the reference population.\textsuperscript{3}

Recumbent length: The measurement of linear growth made on children aged 0-2 years while lying down.\textsuperscript{12}

Standard deviation: A statistical measure of dispersion away from the mean.\textsuperscript{3}

Stunting: A condition that slows the skeletal growth resulting in reduced stature or length (< 90 percent height-for-age or Z-score < -2 SD). It is an indicator of chronic malnutrition resulting from inadequate food intake over a long period of time and/or repeated episodes of illness, especially diarrhoea.\textsuperscript{3,10,11}

Under-weight: A condition measured by weight-for-age (< 80 percent weight-for-age or Z-score < -2 SD) and is a composite measure for both stunting and wasting reflecting either chronic or acute malnutrition status or both. It is the general indicator often used to measure the population's health status.\textsuperscript{3,10,11}

Wasting: A condition measured by weight-for-height/length (< 80 percent weight-for-height/length or Z-score < -2 SD), which results from the loss of both body tissue and fat. It results from recent shortage of adequate nutrition and/ or recent or current acute illness, especially diarrhoea.\textsuperscript{3,10,11}

Z-score: A statistical measure used to describe the indices weight-for-age, height-for-age and weight-for-height with reference to how much the weight or height/length deviates in units of standard deviations, from the median value of the reference
population. It corresponds to the difference between the observed measure and the median of the reference population divided by the standard deviation of the reference population.\textsuperscript{3}
ABSTRACT

Introduction and objectives of the study:

Malnutrition levels have continued to be persistently high in recent years in Zambia posing a challenge to health care providers and policy makers. Data from Zambia Demographic Health Survey (ZDHS) of 2001/02 reveal that 47.0 % of Zambian children aged 0-59 months are stunted, 5.0 % are wasted and 28.0 % are underweight. Cost effective strategies need to be developed to diagnose and prevent high levels of undernutrition in the earliest stages when the child shows signs of growth faltering. One such strategy that can be used to detect and prevent undernutrition and growth faltering in the early stages is growth monitoring and promotion (GMP). It is against this background that this study was conducted between mid July to end December, 2002 and assessed the effectiveness of the growth monitoring and promotion practices of health care providers, following training, within the Lusaka urban district of Zambia.

The aim of the study was to evaluate the effectiveness of growth monitoring and promotion following implementation of a training programme among primary health care workers in six selected health facilities within the Lusaka district of Zambia.

The specific objectives of the study were:

- To determine the practices of trained and untrained health centre staff and community health workers that are executing GMP services in the Lusaka district of Zambia.

- To determine whether anthropometric/nutritional outcomes among children aged 0-2 years are improved with training of health workers at health facilities and community posts within the primary health care sector.

- To determine knowledge, attitudes and practices of mothers/caregivers of growth monitoring and promotion and its impact on feeding practices and weight gain of their children.
• To determine and compare the knowledge, attitudes and practices of trained and untrained primary health care providers of growth monitoring and promotion.

Methodology:

A prospective cohort study with an analytical component was used to assess the anthropometric status of children < 2 years over 4-monthly visits. Interviews were conducted with health facility managers and health staff and community health workers to assess their knowledge, attitudes and practices of GMP. Mothers’/caregivers’ knowledge on various aspects of growth monitoring and promotion was also assessed using structured questionnaires.

Five focus group discussions were held with mothers to determine their knowledge and perception of the importance of GMP. Information gathered included the feasibility of bringing their children for regular GMP sessions and what they thought could be done to improve their children’s growth.

Results:

Between 15 July and 31 December 2002, 698 growth faltering children, health care providers and mothers/caregivers of eligible children were recruited from the six randomly selected health facilities and four community posts that fall within the catchment area of the Lusaka District Health Management Board (LDHMB). These were Kanyama, Chawama, Mtendere, Bauleni, Kamwala and Kabwata and the community posts of Mahatma Ghandi, Chitukuko, Kalikiliki, and Africa direction. The knowledge, attitudes and practices of six health facility managers, 16 health staff and 19 CHWs was assessed at the selected health facilities and community posts. The anthropometric status of the children in the study deteriorated over the four-month study period. There was a high drop-out rate (51 %) between the first and second follow-up visits at the untrained health facilities compared to the other two sites (32 % for trained health facilities and 40 % for community posts). The change in the mean (SD) weight-for-age Z-score was −0.14 (0.34), −0.2 (0.35) and −0.27 (0.32) for trained health facilities, community posts and untrained health facilities, respectively. However, because of the large drop-out rate
between the visits, the change in the mean weight-for-age Z-score of the children was not similarly reflected for trained health facilities, community posts and untrained health facilities at the third follow-up visit (change in mean (SD) Z-scores: -0.26 (0.5), -0.47 (0.7) and -0.31 (0.44)) and the fourth follow-up visit (change in mean (SD) Z-scores: -0.5 (0.6), -0.8 (0.7) and -0.3 (0.47).

Child and infant feeding practices, particularly breastfeeding practices, were high with 99.6% children still being breastfed while exclusive breastfeeding was not practised according to the WHO/UNICEF recommendations. There was early introduction of complementary foods usually by the age of three months with plain soft maize-meal porridge being the most common complementary first food. Further complementary foods that were introduced were low in energy density and supplementary foods such as oil and margarine were only occasionally added to foods when they became available.

The findings of this study suggest that the Lusaka district health management board growth monitoring and promotion programme is not working effectively. Health care providers demonstrated poor growth monitoring and promotion practices. They were not interpreting children’s growth curves and translating the information from the growth curves into nutritional counselling and feeding advice. Although practices were not any better at trained health facilities, they indicated overall better growth monitoring and promotion knowledge than the untrained health facilities. Qualitative results indicated that health care providers were not supportive of the mothers/caregivers concerns about their children’s nutritional status and their attitude was found to be negative towards the mothers/caregivers during the GMP sessions. Mothers/caregivers were found to be fairly knowledgeable in interpreting the directions of the growth curve.

Mothers/caregivers linked GMP to the importance of under-five clinic to the child’s weight, which was an indication of good or bad health status. Mothers/caregivers were willing to put into practice health workers’ information and suggestions and they further indicated that they did not find any problems in bringing their children for under-five clinic visits. Major problems mothers/caregivers faced were financial constraints, which led to food insecurity particularly at household level.
Conclusion:

The findings of this study indicate that in the Lusaka district there is a problem with the implementation of the GMP programme. The anthropometric status of the children deteriorated both at the trained and untrained sites. The GMP programme was ineffective despite training. This was compounded by a large coverage area, which could have compromised the GMP practices of staff. Health care providers demonstrated poor practices such as not giving individualized counselling and lack of appropriate feeding advice. They also were poorly motivated and inadequately supervised. Other weaknesses in the programme were poor community involvement, support, referral system and monitoring and supervision as well as inadequate logistics, supplies and proper shelters in the community for conducting GMP sessions.

Recommendations:

The current GMP training programme needs to be reviewed and strengthened to ensure its effectiveness. A review of the training manuals will also provide a formalized approach to the early detection of growth faltering. Building in components such as community involvement and support, monitoring, supervision and mentorship and a referral system will strengthen the programme. Defining the vision and management of the programme at community level rather than at central level will give the programme a sense of ownership. The inclusion of a behavioural change component for health care providers could make the programme more user-friendly.
CHAPTER 1: INTRODUCTION

Undernutrition has long been recognized as a serious public health problem in Zambia and has worsened in recent years.\textsuperscript{11,14} It is still one of the most important health and welfare problems among infants and young children in Zambia, resulting in serious consequences for both the individual and nation.\textsuperscript{10,15} It was estimated that 38 % of all deaths among children under the age of 5 years was related to undernutrition.\textsuperscript{9,11} Available sources from ZDHS (2001/02) revealed that 47 % of Zambian children aged 0-59 months were stunted, 5 % were wasted and 28 % were underweight. The problem appeared to have worsened as data from ZDHS (1996) indicated that 42 % under five years were stunted, 4 % were wasted and 24 % were underweight while data from ZDHS (1992) indicated that 40% of the children were stunted, 5 % were wasted and 25 % underweight.\textsuperscript{10,11}

Undernutrition poses a challenge to health care providers and policy makers who often have to deal with issues of lack of trained staff, insufficient time and overcrowding of health facilities, often compromising the quality of nutritional care that is provided. Factors associated with poor nutritional status in Zambian children include high levels of food insecurity, limited duration of breastfeeding and poor quality weaning and complementary foods and widespread poverty.\textsuperscript{10,11,13,14}

It is against this background that cost effective strategies need to be developed so that high levels of malnutrition can be diagnosed, prevented and actively treated in the earliest stages when the child shows signs of growth faltering.\textsuperscript{1,2} It is much easier at the stage of “early growth faltering” to manage weight loss and bring the child back to “good health,” in terms of improved weight gain, than when the child has lost a large amount of weight and becomes visibly malnourished. One such strategy that can be used to detect and prevent undernutrition and growth faltering in the early stages is growth monitoring and promotion (GMP).\textsuperscript{2} It has been shown that nutrition interventions aimed at the prevention, detection and timely treatment of all types of undernutrition, in particular mild cases, can have a tremendous impact on child survival.\textsuperscript{16}
Growth monitoring and promotion can be said to be an elaborate "documentation process" of a child's growth pattern over a period of time. It is built on an existing foundation of nutritional assessment used to screen populations for undernutrition. Many public health programmes have attempted to transform these detection activities into monitoring and promotion of growth.\textsuperscript{16}

GMP, if well targeted, deals with the need to redirect attention from merely weighing children and plotting their weights to counselling mothers/caregivers to take actions that would prevent children from being undernourished. However, counselling messages need to be translated into feeding practices by the mother/caregiver at home in order to bring improved weight gain in the child.

As such, there is need to evaluate if investment in GMP is worthwhile and may alleviate the problem of high levels of undernutrition in Zambia. The present research aimed to determine the effectiveness of GMP practices following the implementation of a GMP training programme at health facilities in the Lusaka district of Zambia.
CHAPTER 2: LITERATURE REVIEW

2.1. Definition of growth monitoring and promotion

Generally there is still no agreement on what growth monitoring and promotion actually means, as the term still appears to mean different things to different people. Growth monitoring and promotion has been defined as “the regular measurement, recording and interpretation of a child’s growth in order to counsel, act, and follow-up results”. The term “promotion” was added to “growth monitoring” to emphasize the action component of the activity. Growth monitoring refers to regular weighing and plotting of a child’s weight on the growth card to decide if the child is gaining weight or not, while growth promotion refers to the actions that are taken to ensure that the child grows well. Growth assessments thus do not only serve as a means for evaluating the health and nutritional status of children but also provide an indirect measurement of the quality of life of an entire population.

GMP implies a regular and sequential measurement of growth, recognizing growth to be the result of overall health, nutritional, environmental, social, psychological and developmental factors in the child and is based on a strategy aimed at behavioural change and adoption of improved self-help actions within the community to promote optimal health. Rohde (1988) further adds that GMP is a communication strategy for making health and nutrition education more individualized, and more effective. Growth monitoring and promotion embraces the recognition of shifting responsibility and actions from providers of therapeutic services to proactive behaviour change among informed mothers, to the ultimate goal of comprehensive community action addressed at the root causes of ill health and undernutrition.

Further, growth monitoring and promotion is a tool that is used to catch children that are “just beginning” to lose weight who are classified as growth faltering. If ideally practiced it is a useful tool that can prevent such children from deteriorating further to severe undernutrition. It is an important technique for identifying individuals, groups or communities whose growth deviates from the expected growth pattern. Poor growth,
whether as a result of infection, undernutrition or another cause, and whether evident in particular individuals or in population groups, need to be detected in order that corrective action is taken.

2.2. History of growth monitoring and promotion

Nearly 20 years ago a group of scientists met under the auspices of the World Health Organization to investigate ways of using anthropometry as a tool for assessing the nutritional status of children. This was a benchmark for the organized collection and standardization of information on the nutritional status of the world’s under-five population. Today, in a space of two decades, growth monitoring is considered to be a powerful tool for assessing the health and nutritional status of children and identifying those in need of nutrition intervention.22

The initiative of weighing and charting results on weight-for-age graphs, first described by Morley in the 1960s was developed as a clinic-based programme and became a worldwide trend in the 1970s spreading to several developing countries such as Sierra Leone, Malawi and Zambia. In Zambia, growth monitoring and promotion was introduced in the 1980s after undernutrition was recognised to be a major public health problem and was formally adopted as part of primary health care.

Growth monitoring and promotion has been delivered most effectively in combination with other primary health care services such as immunization. The rationale for growth monitoring and promotion is that the recognition of abnormal growth will prompt appropriate intervention or action by health care providers or mothers/caregivers who were previously not aware of their children’s nutritional status. Appropriate intervention or action by mothers/caregivers and health care professionals can therefore result in positive child growth.23

UNICEF took up the challenge of global advocacy for growth monitoring as a component of its selective primary health care approach. In the 1970s, growth monitoring and promotion became part of GOBIFFF (an acronym for growth monitoring, oral rehydration therapy, breastfeeding and immunization, female education, family planning
and food supplementation), which was an effort by UNICEF to prioritize primary health care.\textsuperscript{24,25} UNICEF persuaded other organizations to be more vocal in supporting growth monitoring. A result of this advocacy was the endorsement by the International Congress of Paediatrics in 1983. The advocacy campaign for GOBIFFF was continued by UNICEF and included the following:

(i) Growth monitoring was to serve as the basis for making growth faltering visible to a child’s mother/caretaker so that better use could be made of household resources. (ii) International advocacy would help endorse the idea that a concerted effort could be made, on a global scale, about undernutrition. The ‘G’ of GOBI was advocated as the strategy around which the other activities could be introduced as essential elements of primary health care.

2.3. Importance of growth monitoring and promotion in child health and nutrition

Previously, attention had been focused largely on infants and young children, because of their vulnerability, and on the value of anthropometry in characterizing growth and well-being. Advances during the past decade, however, have demonstrated the relevance of anthropometry throughout life, not only for individual assessments but also reflecting the health status and social and economic circumstances of population groups. Anthropometry entails the measurement of length, height, weight, and mid-upper arm circumference which are generally the best global indicators of physical well-being in children.\textsuperscript{26,27,28} Current research has expanded the applications of anthropometry to include predicting who will benefit from interventions, and evaluating responses to interventions.\textsuperscript{16}

Evidence from successful and unsuccessful GMP programmes demonstrate that unless a programme has been designed and implemented to use growth data for decision-making and action, there is no reason to expect that the monitoring and promotion of growth will make a difference to health and nutrition outcomes. Unless the response to an individual child is tailored to reflect what the growth monitoring and promotion discussion with the family, the time spent on weighing might be better used on other activities.\textsuperscript{2} Inadequate
growth, as shown by a flattening of the growth curve on the growth chart, is one of the first signs which should alert the health care providers and mothers/caregivers to take adequate necessary steps to reverse the trend.29,30

Growth monitoring and promotion can be used as a diagnostic pointer in relation to early detection of growth faltering, e.g. drawing attention to relatively covert illnesses such as tuberculosis when there is otherwise unexplained growth faltering.31 Children who are weighed monthly have the advantage of having nutrition-problems detected early. It is more difficult to treat a child who is already undernourished than to prevent a child from becoming undernourished.1 The early months when most children grow well is the ideal time to communicate the importance of growth to the mother, and to re-enforce positive messages and encouragement for good growth seen in children.19 This empowers the mother/caregiver to be interested in monitoring the growth patterns of her child each month. Then at the first sign of poor growth, the mother/caregiver will be far more receptive to messages and ideas on how she can restore growth in her child whom she has seen growing each month.30,32,33 Evaluations have demonstrated that when programmes target specific advice to families using growth and health status as defining criteria, families are able to make improvements in practices that lead to improved nutrition status. This emphasizes the fact that the strength of growth monitoring and promotion rests on its ability to identify those families in need of assistance where this might otherwise be difficult.2,33

2.4. Growth monitoring and promotion as part of nutrition programmes

Growth monitoring has been undertaken successfully in many different country programmes. The Family Nutrition Improvement Programme in Indonesia (UPGK), the Tamil Nadu Integrated Nutrition programme in India (TINP), the Iringa Nutrition Project in Tanzania (INP) and the Thailand Nutrition and Primary Health Care Programme, have all unanimously agreed that growth monitoring and promotion was key to success. There were in-built success factors in these programmes such as community involvement, training, support, monitoring, supervision, referral system and provision of resources and logistics which although they varied between programmes still placed growth monitoring
at the centre of the programme. These are some of the few published examples of well-designed evaluations of community-based nutrition interventions and all these programmes were targeted in one way or another. Growth monitoring also has the advantage of recording responses to intervention.

Growth monitoring can be effective as an educational tool particularly in community-based rather than clinic-based settings. Where the community takes a central role in programme initiatives, growth monitoring becomes a catalyst for action. Growth monitoring and promotion is the focus for communication with mothers/caregivers and health care providers regarding issues of the child’s health, which subsequently stimulates thinking about the causes of poor growth and undernutrition. Growth monitoring and promotion also creates the demand for a variety of services, which together are important to the promotion of growth. Mothers/caregivers can observe what is happening to their children directly and learn to interpret and act upon what they see, with counselling from the health worker. When the mothers/caretakers understand the weight-for-age curve and recognize early growth failure they may take action. Thus, growth monitoring and promotion is a wonderful motivator and, as such, a cornerstone for community child health programmes.

2.5. Effectiveness of growth monitoring and promotion

Other than the UPGK, TINP, INP and the Thailand Nutrition and Primary Health Care Programme that have demonstrated successes in GMP, most available data do not give enough indication of the effectiveness of growth monitoring and promotion. Most available evidence such as that from the Nutrition and Early Childhood Development project (NECDP) in Uganda, Ethiopia Food Security Project have instead shown mixed results calling for more work on GMP to demonstrate its usefulness and benefits. The debate continues as to whether periodic weighing, charting of growth, and delivery of information on proper infant feeding and care is a wise use of scarce health resources in developing countries. Critics argue that the role of GMP should be seriously reconsidered and that more research is needed on its feasibility and cost-effectiveness, while supporters believe that current evidence is sufficient to support continued practice and
implementation of GMP in a growing number of programmes worldwide. Part of this controversy seems to result from lack of consensus on what GMP really is, what it can potentially achieve, and how it should be evaluated.\textsuperscript{15,18,24,33} This debate has led to the usefulness of growth monitoring being questioned in terms of whether mothers/caregivers should regularly attend weighing sessions; whether they understand the information contained on the growth charts; whether health workers understand growth charts, and if so, whether they recognize growth faltering; whether health workers provide appropriate nutritional counselling to mothers/caregivers based on the results of the process of growth monitoring\textsuperscript{34,35,36} The importance of involving mothers/caregivers and their families in the weighing of children has been recognized as one of the positive actions that needs to be taken to increase involvement of families and communities in health related measurements\textsuperscript{2,33}

One report by Gopalan and Chatterjee, suggested that the original aims of growth monitoring and promotion were not being met as health workers, were not using the growth charts properly. An essential requirement for the greater participation for mothers/caregivers is for them to understand the growth curve and for health care providers to understand the meaning of the growth curve. Growth charts are poorly and rarely completed, and decisions by health workers together with mothers are generally not taken when the growth curve falters. As such, there is worldwide failure of growth monitoring to improve nutrition and reduce child mortality. Unless adequately completed, the growth chart is rendered unusable in detecting growth faltering.\textsuperscript{32,33,37,38}

Problems that are associated with the interpretation of the growth curve are rarely taken into account when faltering occurs. The value of the growth curve has been diminished by an unfortunate emphasis on where the child’s weight is in relation to the standard reference curve. It is the \textbf{direction} of the curve, which is important, not whether the dot representing the weight lies above or below the reference line.\textsuperscript{38,39} It has also been argued that growth-monitoring programmes may not appear to be effective because high-risk children are not specifically targeted.\textsuperscript{10,40}
A community intervention study was conducted in 550 children < 60 months of age over a period of 4 years in 12 South Indian villages in Tamil Nadu. The aim of the study was to evaluate the benefits of growth monitoring. Two intervention groups, each comprising 6 villages, were compared to “growth monitoring package” (GMP) with “non-growth monitoring package” (NGM). NGM villages received the same interventions as did the GMP villages except for growth monitoring that is education without growth charts. A fully functional primary health care system was in place in the 12 villages and a nutrition worker in each village was responsible for implementing a set of interventions. Anthropometric measurements were made every 4 to 5 months, independently of the nutrition worker, by comparing monthly gains in stature and weight adjusting for any significant differences observed for age and sex. Results indicated that after the intervention period, similar improvements in growth based on mean weight-for-age were seen in both the GMP and NGM which questions the additional benefit of the use of growth monitoring and promotion as part of child survival programmes.41

Another “pitfall” of growth monitoring programmes has been the tendency to focus on children who are already undernourished as identified through nutrition-status criteria, thereby losing the relative advantage of detecting growth faltering early enough to prevent undernutrition. When faltering is caught early, small changes in behaviour that are within the means of many families are likely to be effective in reversing the trend, whereas rehabilitation once undernutrition has occurred is costly, time-consuming, and often ineffective in preventing relapse.2,17

Morley and Meegan highlight further that it was difficult to prove the benefits of growth monitoring and promotion in terms of reduced mortality and improved nutrition compared to other strategies such as immunization and rehydration.25,33 These showed that immunization and oral rehydration could have marked benefits in terms of reducing mortality, but the same could not be shown for growth monitoring. No difference in reduced mortality or improved nutrition was shown by the use of growth charts. As a result of these findings, emphasis of growth monitoring programmes has been downplayed even in developing countries and as such growth monitoring is now seldom mentioned in publications concerned with improving the nutrition of children.25
Despite intensive efforts, the reduction in undernutrition has been a challenge for health care providers and policy-makers for decades complicated by a combination of many other influencing factors. Lack of adequately trained staff, insufficient time and overcrowding of health facilities; often compromise the quality of nutritional care that is provided.\textsuperscript{24,25,26} Health workers conduct most growth monitoring and promotion activities, either in a fixed facility or during occasional visits to a community where they request that all children be brought for weighing and nutrition education.\textsuperscript{42}

Another problem has been that a lot of data are collected in most GMP activities that are not useful to health care providers and policy makers and not utilized for decision making.\textsuperscript{43} Caution should be exercised when considering health data from most African health collection surveillance systems are often inaccurate and incomplete. Because of such limitations, possible assumptions can be made that data from Africa often underestimate the problem according to the WHO global database.\textsuperscript{22}

2.6. Factors affecting the effectiveness of Growth Monitoring and promotion

It is difficult to substantiate the success of any growth monitoring and promotion programme in terms of improved weight gain on one single factor. Factors associated with a successful GMP programme are interlinked in determining weight gain as shown in figure 2.1.
2.6.1. Adequately trained and sufficient numbers of health care providers

In order to have a positive impact on weight gain, health care providers need to be well trained and need to have the right tools such as scales and weight-for-age charts in detecting early deviation from normal growth. The health care providers’ skills in weighing, plotting and interpretation need to be of high quality. They must be able to motivate the community and involve the mother in the whole process of weighing, follow-up action etc.
2.6.2. Mothers'/caregivers' knowledge, attitude and practices on growth monitoring and promotion

The mother/caregiver must understand the value of growth monitoring as a tool to better health. In order to change her practices, a considerable amount of weighing will need to be done particularly at community level, near her home before she can understand the value of weighing and feels that it is worth her while to go for weighing regularly. Mothers/caregivers who understand the value of weighing will become active partners in the growth monitoring process.44

2.6.3. Community Involvement

The involvement of communities is essential in the success of growth monitoring and promotion where mothers can help with weighing, charting, group discussions etc. as a way of promoting partnership. However community participation needs to go beyond this to ensure proper functioning of the services and ensure quality delivery of services. Though a programme is usually assessed using coverage, it should be remembered that most needy families do not often make use of the services and an effort should be made to include them through community participation and mobilization.

2.6.4. Good referral system

A good referral system at all levels of service provision is part of a good growth monitoring and promotion programme in order to achieve the intended outcome of improved weight gain. This should be done as a two way referral system using the top-bottom and vice versa approach. This makes it easier for follow-up to be conducted successfully.

2.6.5. Accessibility to health facilities or community posts

Bringing health services closer to communities is one opportunity that can be utilised to improve the services of growth monitoring and promotion. The closer the GMP point is to the mothers/caregivers, the easier it becomes for them to utilize the service to their fullest capacity.
2.6.6. Strong monitoring system

GMP indicators that will help in the assessment of the programme are a vital component of a successful GMP programme. A lesson from some of the successful programmes indicated that clear indicators that are understood by all participating cadres in the programmes were a major step in making the programme successful.

2.6.7. Support and supervision

The component of provision of quality supervision by health care providers should be supportive and educative and be practicable so as to provide frequent visits. Providing feedback to the worker helps to put right whatever is not being done correctly and this should extend to the household which strengthens the mother/caregiver-health care provider relationship.

2.6.8. Adequate supplies and logistics

Adequate supplies and logistics are essential in ensuring that the growth monitoring programme runs smoothly. This does not only include scales and weighing bags, but also stationery, furniture, vehicles and shelter.

2.7. Growth monitoring and promotion as part of a package of interventions

The use of growth monitoring should extend beyond problem detection. A good growth monitoring and promotion package should include the component of counselling and various actions taken to improve the nutrition of the child. Individual counselling of mothers is supposed to be an integrated component of growth monitoring and is expected to motivate mothers to improve the health and feeding practices when their child's growth is faltering. 2,24,37,45

Although health workers easily note signs of undernutrition, these may be identified when it is too late, making it more expensive, to help the severely malnourished child. This is because growth monitoring and promotion is not part of an integrated package in
a busy clinic where health workers can more efficiently and rapidly process the weighing activity.\textsuperscript{1,2,36}

According to Marcia Griffiths et al.\textsuperscript{2} the full impact of growth promotion can be realized when it is employed to make decisions about three types of actions: (i) Recommendations for individual children’s care, particularly related to illness and feeding, but also cognitive and motor development. (ii) Activity plans for the community that aim to make it easier for families to maintain the growth of their children by, for example, addressing problems of food shortages, poor water conditions, or collective child care needs that extend beyond a single household. (iii) Programme activities to bolster community actions that affect households with special needs, such as income generating or transfer schemes. Guidance is needed on the selection of appropriate actions and the content of counselling to improve child health and nutrition.

According to Griffiths et al.\textsuperscript{2} and BASICS II publication package\textsuperscript{46}, a growth monitoring and promotion package should comprise the following:

1. \textbf{Regular assessment of the child’s health and growth:}
Weighing the child- monthly for the first 2 years of life. Usually performed by graphing the weight for the age of the child on a growth curve.
Determining the adequacy of weight gain or the velocity of growth between visits.
Assessing the health status of the child.

2. \textbf{Decision making and action needed for the child:}
Talking with the mother, or other caretakers, to determine the causes of problems or the reasons for successes over the past month.
Tailoring the counselling.
Addressing underlying health problems.
Defining the next steps and when to return.
3. Decision making and action at the community and programme level to integrate and target services and resources to motivate and enhance actions in the household.

4. Follow-up/feedback on the effects of actions taken:
   At household level – the specific child in question.
   At community / programme level – all children in the coverage area.

2.8. Other measures of growth

Besides data from growth monitoring, there are other anthropometric measures that have practical use for either identifying those individuals who require intervention or examining the prevalence of undernutrition in a community so that preventive measures can be taken.\(^{47,48}\) In children, nutritional indicators often serve as proxy indicators of the overall well being of the population because they reflect the burden of infectious diseases in the community, as well as access to food and caring practices (UNICEF, 1998).

The three main types of anthropometric measurements or indices, which are commonly used, are length, height and weight.\(^{47,48}\) When weight, height and length are linked with age and gender, they are measured to derive the following indices: weight-for-age (WFA), weight-for-length (WFL) and length-for-age (LFA). Each indicator gives specific nutritional information, consequences and implications when compared to standard values of the National Centre for Health Statistics (NCHS); the reference, which is recommended by the World Health Organization (W.H.O).\(^{3,12}\) The most widely used classification is that recommended by W.H.O., which is tabulated on the next page.

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>Classification of undernutrition</th>
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<tbody>
<tr>
<td>&lt;-1 Z-score</td>
<td>Mild</td>
</tr>
<tr>
<td>&lt;-2 Z-score</td>
<td>Moderate</td>
</tr>
<tr>
<td>&lt;-3 Z-score</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Source\(^3\)

Table 2.1 W.H.O. classification system for undernutrition
2.8.1. Z-Scores

The indices, with reference to growth data may be analysed and expressed as the number of Standard Deviations from the median. The Z-score is widely recognized as the best system for analysis and presentation of anthropometric data because of its advantages compared to other methods as it corrects for differences in age amongst a group of children. Z-score corresponds to the difference between the observed anthropometric value and the mean or median of the reference population expressed in units of standard deviation of the standard population.\textsuperscript{3,12}

2.8.2. Cut-off points interpretation

The commonly used cut-off with Z-scores interpretation is -2 SD, irrespective of the indicator used.\textsuperscript{3} Cut-offs are predetermined risk levels used to differentiate between undernutrition and adequately nourished segments of a population. Severely malnourished children are those with a weight-for-height < -3 SD, while those with < -2 to > -3 SD are moderately malnourished and those between -1 to -2 SD are mildly malnourished. Classification of height-for-age -3 SD indicates severe stunting while those with < -2 to > -3 SD moderately stunted. Those with mild stunting are between -1 to -2 SD.\textsuperscript{3,47,48} Caution should be taken when looking after moderately and mildly malnourished children as their condition can change and worsen much more rapidly, especially in situations where there are other complications, which may be rarely listed as the direct cause.\textsuperscript{9} Ordinal classifications of normal nutritional status and moderate and severe undernutrition are used for interpreting the anthropometrical indicators of weight-for-age (underweight), weight-for-height (wasting), and height-for-age (stunting).

**Weight-for-age** identifies the condition of being underweight\textsuperscript{3} and is one of the better indicators to use in children aged 0-2 years because weight is more sensitive and easy to perform than measuring length.

**Weight-for-height/length** identifies children who are wasted and it is useful when it is difficult to determine the exact ages of children. It is also useful for assessing short-term
effects such as seasonal changes in food supply or short-term nutritional stress brought by illness.³

**Length/height-for-age** identifies the condition stunting.³ Recumbent length is measured for children below 2 years old or children who are less than 85 cm; thereafter standing height is measured.⁴ The length or height is a fairly difficult measurement to perform, particularly in infants and small children, for whom monitoring is of greatest value. The possible inaccuracies associated with the difficulties in making this measurement, makes it more problematic to detect differences between two values determined within a short time interval. Furthermore, length or height does not decrease and therefore cannot indicate deterioration in health.³

### 2.9. Studies assessing the nutritional status of children in Zambia

Zambia was one of 43 countries in Africa studied as part of the W.H.O. global database on child growth monitoring and undernutrition. The survey conducted covered all the provinces in Zambia. The findings revealed that in Southern Africa, Zambia had a high prevalence of underweight at 22.6 %, stunting at 40% and wasting at < 5 %.²²

Few representative studies have been performed on the nutritional and growth status of Zambian children under the age of five years. A study was conducted in 1987 on 1 251 children in three regions of the Eastern province of Zambia in order to assess their nutritional status using MUAC and the determinants thereof.⁴² The study was a retrospective review of under-five case records to get information about age, sex and immunizations. The results indicated that there was an inverse relationship between maternal education and undernutrition. Immunization status and nutritional status were lowest in children of mothers with the lowest educational attainment.

A rapid screening survey was also done between July and August 1983 on 600 under five year olds to assess their nutritional status (acute undernutrition) using a mid-upper-arm circumference (MUAC) measurements.⁴³ The results of these investigations showed that nearly a third of the sample were too thin for their age among children aged < 2 years.
Another study was conducted in 1975 in Lusaka on 360 undernourished children at University Teaching Hospital, which assessed the effects of social and economic determinants and feeding habits of children in the evolution of protein calorie undernutrition (PCM). The results indicated 26% mortality occurred in undernourished group, while in the non-undernourished group mortality was at 12%. It was also observed that 59.3% undernourished children out of 96 died within 24 – 48 hours of admission. There was a high incidence of undernutrition from the poorly developed areas in the city perimeters. The poor environmental sanitation in these areas contributed towards infections and parasite infestations, which in turn aggravated undernutrition. It was also found that only 30% of the undernourished children had attended a children’s clinic regularly. The other 70% had visited a few times and then stopped attending. Breastfeeding for 6 months and above was practised by 88% of the mothers with only 11.7% practising bottle-feeding for less than 6 months. The majority of the families (83.3%) were labourers with inadequate income to feed their families due to the high cost of living.

2.10. Studies from other developing countries on the nutritional status of children

Another study was conducted in a low-income community in Lima, Peru from 1982-1984 by Piwoz et al. to determine indicators and age intervals for growth monitoring of 102 infants, and determine the relationship between monthly weight and length indicators and nutritional status at 12 months. Weight and recumbent length were measured within a week of birth and at monthly intervals thereafter. Home visits were conducted thrice weekly to obtain information the infants’ health status on that day and the two preceding days. Dietary information was also collected by 12-hour observations as well as breast milk consumption, which was measured, by test-weighing method. Compared with infants with desirable weight-for-age measurements, the results indicated that, infants with low weights at 12 months gained less weight during the first, fourth, fifth, eight and eleventh months. These infants also gained less length during their third and ninth months. Infants of low length for age gained less weight each month than did infants with adequate length at 12 months. The results also indicated that the risk of being low weight-
for-age at 12 months was greater for infants with low monthly gains from 1 to 5 months. The implications of this study regarding GMP are that low weight-for-age and length-for-age affect weight gain, particularly in infants of < 12 months.

Wells et al.51 conducted a study in 23 developing countries and 2 developed populations where data relating to patterns of weight gain of infants were compared. The criteria for selection were that the population size should be greater than 50 and that longitudinal measurements had been made at birth, 3, 6, 9, and 12 months. These populations were compared with NCHS reference standards and with a second reference sample of 212 children from Stockholm urban area. The Swedish children were mostly initially breastfed, which allowed for an appropriate comparison with developing country populations where breastfeeding is typically the norm. Results showed a variability of poor growth with the range within the 23 populations varying from 74 – 104 % of the NCHS 50th percentile at birth and 56–96 % of the NCHS 50th percentile at 12 months. The mean weight of all populations were significantly below the NCHS median at 12 months (p < 0.001); in 20 of the populations it was below the NCHS 25th percentile and in 11 populations below the NHCS 10th percentile. Initially, monthly increments were higher (80-181) than in the Western populations, and all increments were below the standard by 9 months (34-100).

M. Faber et al.52 did a study to determine the acceptability of community-based growth monitoring at home-based growth monitoring points called Isizinda, in a rural village, KwaZulu-Natal, South Africa. The study combined both quantitative and qualitative components in collecting information. Quantitative component was applied for collecting information on child attendance as well as a review of registers from 1996-2000 to determine the attendance ratio, coverage, and adequacy of growth monitoring and frequency distribution of the age of participating children. The qualitative component used FDGs to assess maternal attitude. Results indicated that coverage was at 90 % and frequency of child visits to the growth monitoring points was equally distributed over one-year-interval age categories for children aged younger than five years. Mothers were very enthusiastic and keen to have their children's weight checked regularly. They were pleased with the activities of this study as they made them aware of the link between
appropriate weight gain, nutrition and their children’s health a finding that is confirmed by the qualitative results of this current study. The mothers felt a sense of empowerment as they gained better understanding of issues that made their children healthy. However the study revealed that mothers were unhappy with the government’s mobile clinic and they also perceived health staff to be hostile an unhelpful.

Another study done by Endang Achadi and Peter Berman on the assessment of coverage and regularity of attendance in a Gedangan village, CentralJava, Indonesia.53 The study used a structured framework to evaluate the performance of one weighing station over a period of three years with regard to attendance rate, regularity of attendance and targeting of coverage relative to the nutritional status of the children. Village health workers gathered information on 185 children using weighing records. The results indicated that on average attendance was 51.1 % suggesting that on average the registered children came to the clinic only half of the time.

Suparman et al. 54 conducted a cross-sectional that determined whether health-centre performance was related to children’s nutritional status using a two stage sampling system. The first used simple random sample of finite population of which 37 health facilities and head of the health facility and two health workers responsible for nutritional services from each centre participated in the study that was determining whether health centre performance was related to children’s nutritional status. The second phase involved three health facilities where 254 children aged 6 and 36 months were selected from three health facilities in the high performance area and three health centres in the low-performance groups. The results indicated that health-centre performance was low despite most health facilities reporting accessibility coverage of 80 %; the actual coverage was lower than 60 %, and effectiveness was at 43 % making it difficult for the health facility to improve children’s nutritional status.

2.11. Summary of literature review

While GMP has the potential to be used as a tool in promoting growth and reducing undernutrition, the evidence to support its effectiveness is conflicting and limited. Hence further evaluative research especially from developing countries, is needed in order to
assess its effectiveness and usage. Information gathered from such studies will help establish the circumstances under which growth monitoring can make a significant contribution to the effectiveness of not only child health promoting programmes but also to the practices of health care providers’ activities.
CHAPTER 3: AIM AND OBJECTIVES

3.1. Study Aim
To evaluate the effectiveness of growth monitoring and promotion following implementation of a training programme among primary health care workers in six selected health facilities within the Lusaka district of Zambia.

3.1.1. Specific objectives

- To determine the practices of trained and untrained health centre staff and community health workers that are executing GMP services in the Lusaka district of Zambia.

- To determine whether anthropometric/nutritional outcomes among children aged 0-2 years are improved with training of health workers at health facilities and community posts within the primary health care sector.

- To determine knowledge, attitudes and practices of mothers/caregivers on growth monitoring and promotion and its impact on feeding practices and weight gain of their children.

- To determine and compare the knowledge, attitudes and practices of trained and untrained primary health care providers on growth monitoring and promotion.

3.1.2. Implementation objectives

- Based on the findings, recommendations will be made for improving and strengthening the growth monitoring and promotion programme in reducing undernutrition rates in Lusaka district.

- The findings of the study will be used to influence policy regarding growth monitoring training and practices in Zambia.
CHAPTER 4: METHODOLOGY

4.1. Position of Zambia

Zambia is a landlocked country situated in the Southern part of Sub-Saharan Africa. It is bordered by the Democratic Republic of Congo and Tanzania to the north, Malawi and Mozambique to the east, Zimbabwe and Botswana to the south, and Namibia and Angola to the west. For administrative purposes the country is divided into nine provinces and 72 districts.

4.2. Study site

The study was conducted in Lusaka district, which is found in Lusaka province, and it is also the capital city of Zambia. It has a population of approximately 1 187 117 of which about 237 426 are children under the age of five years. The prevalence of undernutrition is currently estimated to be between 10 - 12.0 %.\textsuperscript{55}

Lusaka district has a total of 25 health facilities. Some of these health facilities had their staff trained in growth monitoring and promotion at health centre and community levels according to information obtained from the Lusaka District Health Management Board (LDHMB). The current research was conducted at six health facilities namely Kanyama, Bauleni, Chawama, Mtendere, Kamwala and Kabwata over a period of six months starting mid July to end December 2002.

4.2.1. Kanyama health facility

Kanyama township is a high-density residential area located on the western side of the city. Kanyama health facility is situated in the midst of the township. It is a township with a highly mixed population. Living standards in the compound also vary tremendously. Some houses are properly planned structures while others are typical unplanned shanty township houses. It is near some shanty townships of Chibolya and John Laing and a number of farmlands. There is also a varied mixture of occupations among the population. Some residents of the compound work in the nearby industries in
town and others provide labour on farms found on the western side of the Lusaka city. Kanyama has a population of 114 398 of which 22 890 are under fives.

4.2.2. Chawama health facility

Chawama health facility is situated in Chawama township which is found in the southern direction of the city. This compound has pockets of areas within it that are well-planned council structures with the majority of it being of shanty township status. There are shanties of John Howard, Misisi and again some parts of John Laing that are nearby. Most of the people in this township have varied jobs with a good number being labourers on the farms, found on the southern part of the city. Chawama has a population of 68 515 out of which 13 703 are under fives.

4.2.3. Mtendere health facility

Mtendere township is situated in an easterly direction from the city centre. The health facility is situated within the compound. The compound is very close to a shanty township called Kalikiliki, which falls under the health facility’s’ catchment area. Of the four community posts, Mahatma Ghandi, Chitukuko, Africa direction and Kalikiliki, all but Kalikiliki were situated within Mtendere township. One draw back during the study was the razing down of some of the houses in Kalikiliki by the council, which claimed that they were illegal structures. The total population under the healthy facility is 58 022 out of which 11 604 are under-five children.

4.2.4. Bauleni health facility

Bauleni health facility is situated in Bauleni township, a typical shanty township found in the south-eastern direction of the city. Farms on which most of their population work surrounds Bauleni township. It has a population of 52 356 out of which 10 471 are children aged under-five years.
4.2.5. Kamwala health facility

Kamwala township is a well-planned Council township, which is near Misisi and John Laing shanty townships. The health facility caters for a population of 54 968 of which 10 994 are under-five children.

Kanyama, Chawama, Kamwala health facilities have an overlap over the populations of John Laing and Misisi townships. Although administratively, the Lusaka District Health Management Team has demarcated targeted populations to attend Kanyama, Chawama and Kamwala health facilities, this is not always the case because of proximity of these shanties to these health facilities. The population in these areas attend any of these health facilities and usually give false addresses if they know they are attending the wrong healthy facility.

4.2.6. Kabwata health facility

Kabwata township is another well-planned council township. The health facility caters for a population of 62 549 of which 12 510 are under-five children. At the time of conducting the research the healthy facility had no community health workers in its catchment area.

4.3. Definition of trained and untrained health facilities

The Lusaka District Health Management Board (LDHMB) classified trained health facilities as those health facilities where some health workers, particularly MCH staff at health facility level and community health workers, nutrition demonstrators or child health promoters at community posts had been trained in GMP while those classified as untrained had no staff trained in GMP. Following this classification, Kanyama, Chawama and Mtendere were classified as trained health facilities and some health workers and community post level staff at these health facilities had received training in GMP while those from Bauleni, Kamwala and Kabwata had not received training at the time the study was being conducted. All community posts included in the study were trained and they fell under Mtendere health facility as they were the ones that were active in terms of
conducting Community-Based Growth Monitoring and Promotion (CBGMP). These community posts were Mahatma Gandhi, Africa direction, Chitukuko and Kalikiliki.

4.3.1. Training of health staff and community health workers

The training of health workers and community health workers/child health promoters (CHPs)/nutrition demonstrators on growth monitoring and promotion was conducted by the Lusaka District Health Management Board (LDHMB) with support from co-operating partners such as Japanese International Cooperating Agency (JICA) and Care International Zambia. It was facilitated and coordinated by staff from the district office that had previously undergone a training of trainers’ course in growth monitoring and promotion. Further, two months before the commencement of this study in May 2002, two staff from the LDHMB district office, attended the international course on Community-Based Growth Promotion: Key concepts and field experiences which was held in Zambia. These two staff were to undertake the task of updating their fellow trained health workers on some of the latest concepts on CBGMP, although it was discovered at the time of the study that they had not yet conducted these updates. The international course drew participants from five countries namely Ghana, Senegal, Eritrea, Uganda and Zambia and was supported and facilitated by staff from BASICS/Manoff Group from United States of America.

4.3.2. Duration of training

The training of health workers was of a shorter duration compared to that of community health workers/child health promoters or nutrition demonstrators. The reason for the differences in duration was that the two cadres were at two different levels of education. Health workers were those who had undergone previous basic training in a health field and were mainly qualified nurses, environmental health technicians, nutritionists while community health workers were mainly volunteers from the community and had no previous training of any kind in any health related field. Because of this difference, health staff underwent four days of training which was an orientation to GMP while community health workers/child health promoters/nutrition demonstrators underwent a two-week training session before this study was commenced. The training for both health workers
and CHW's were stretched over the period 2000/002 depending on the programme which was drawn by the LDHMB.

The selection of community health workers/ child health promoters / nutrition demonstrators was mainly based on two criteria that determined whether or not they were eligible to receive training. These were that they needed to be more or less permanent residents of the area they lived in and also they needed to be able to read and write. Training covered issues such as accurate weighing, reading weights and plotting, recording, reporting, counselling and actions on appropriate feeding and follow-up that needed to be taken by health workers or mothers/caregivers to promote child growth.

4.3.3. Defined roles of trained health workers and community health workers

4.3.3.1. Health workers' roles

Other than weighing children who come to the health facilities every month and attending to illnesses and immunizations, health workers are supposed to counsel mothers/caregivers about how the children are doing and give advice on how to help them grow better. Further they help the community health workers / child health workers / nutrition demonstrators plan their GMP programme, organize training and give support on how to solve their problems and supervise them. They also help these cadres organize and report information on GMP and carefully attend to children who are referred from the community posts and give them feedback on what action had been taken.

4.3.3.2. Community health workers / child health promoters / nutrition demonstrators roles

These cadres weigh all children aged 0 -2 years who come to the community posts every month. As they are closer to the community than the health workers they encourage mothers/caregivers to bring children to the community posts unless the child needs special treatment of illness or immunizations and in so doing help reduce the workload and congestion at the health facilities. In addition they counsel mothers/caregivers about how the children are doing and give advice on better feeding practices so that the children
grow better. They also have the role of sharing the information about the health of the children with other community members.

4.3.4. Impact of staff shortages on the growth monitoring and promotion programme

The Lusaka District Health Management Board faces staff shortages like many other district boards in the country and some health facilities under its catchment area are harder hit than others. In order to cushion the impact of these staff shortages, the district has the privilege of transferring health workers from some well-staffed health facilities to those that are poorly staffed. The staff who are trained in GMP take responsibility for co-ordinating the GMP activities at the health facilities they operate from. However in times when training is being conducted, some of the trained staff may be used as resource persons to train other staff members. At the time of conducting this study, only 26 health workers had previously been trained in GMP in the selected six health facilities. During the study it was found that some trained health workers had been transferred to health facilities that were previously classified as untrained. For the purpose of this study, all selected health facilities that had at least one health worker at each health facility, who had been trained in GMP or GMP/IMCI, community health workers (CHWs) or child health promoters (CHPs) or nutrition demonstrators at community posts level who had completed a growth monitoring and promotion training programme were classified as “trained”, and those without any previously trained health workers were classified as “untrained” health facilities.

4.4. Study design

The study had two major study components namely, quantitative and qualitative components which are described below:

4.4.1. Quantitative study component

A prospective cohort study was used for the observational analytical component that measured anthropometric status of children aged 0-2 years between the first visit (baseline) and fourth visit. This also involved conducting interviews with health facility
managers and health staff, community health workers on knowledge, attitudes and practices on growth monitoring and promotion (GMP). Mothers' / caregivers' knowledge of growth monitoring and promotion using structured questionnaires was also assessed.

A diagrammatic representation of the cohort study design indicating measurements at each stage of study is shown in Figure 4.1.
Figure 4.1 Diagrammatic presentation of the quantitative study design

PROSPECTIVE COHORT STUDY DESIGN
Recruitment/ 1st visit/ baseline

Measurements:
- Weight
- Recumbent length
- Mothers' /caregivers' interview on knowledge of GMP
- Mothers' /caregivers' socio-demographic interview
- Health facility managers' in-depth interviews
- Health workers interviews KAP on GMP
- Community health workers' KAP on GMP

2nd follow-up visit at 1 month from baseline

Measurement:
- Weight

3rd follow-up visit at 2 months from baseline

Measurement:
- Weight

4th follow-up visit at 3 months from baseline

Measurements:
- Weight
- Recumbent length
- Repeat Mothers'/caregivers' interview on knowledge of GMP
- Focus group discussions
4.4.2. Study Population

The study population included all children aged 0 – 2 years living within the catchment areas of the selected health facilities and community posts who were attending growth monitoring and promotion sessions. In addition, all six health facility managers in the selected facilities, 26 health staff in the Maternal and Child Health (MCH) unit and 19 community health workers/child health promoters were included in the study population.

4.4.2.1. Study inclusion criteria

1. Children aged 0-2 years who were brought for GMP to the selected health facilities and community posts and fell into the following assessment categories were admitted into the study: -
   - Growth faltering for at least two consecutive months
   - Inadequate weight gain between two consecutive months
   - Static weight between two consecutive months
   - Losing weight for at least two consecutive months

2. All health facility managers from each of the selected health facilities in the study. All health staff in the MCH unit of each of the selected health facilities and health staff dealing with growth monitoring and promotion activities.

3. All active community health workers/ child health promoters from the selected health facilities, dealing with growth monitoring and promotion activities at health facility level or community post level.

4. Mothers/caregivers of children entered in the study that consented to their participation.

At the first visit, all eligible children were registered and were given consecutive numbers that were matched with those of their mothers/caregivers records to make it easier to determine the records.
4.4.2.2. Study exclusion criteria

Children aged 0-2 years with following conditions were excluded:

- Low Birth Weight ($\leq 2.5$kg) registering for the first time.
- Children with marasmus (severe wasting) or with kwashiorkor (see under definitions).
- Children with tuberculosis (from health facility records)
- Children with known or suspected HIV/AIDS by health providers using W.H.O. clinical signs.$^{56,57}$

4.4.3. Sampling method

Six health facilities (trained and untrained) out of a total of 25 were randomly selected. In addition four community posts, which were the only active ones among the selected health facilities, were also included in the study. The three trained health facilities were randomly sampled from a total of seven trained health facilities while the untrained health facilities were random sampled from a total of 18 untrained health facilities in Lusaka.

Study participants were conveniently admitted to the study. All the six health facility nurses in-charge, health providers in the MCH units of these health facilities, community health workers and mothers/caregivers of eligible children were also included in the study.

4.4.4. Sample size

Calculation of the required sample size is not always a clear-cut procedure, as it requires making certain assumptions, which may or may not be correct so as to be able to quantify the objectives. Based on the estimated prevalence of undernutrition in the district, which is between 10-12.0 %, a sample size of 950 was calculated for trained and untrained health facilities. An expected drop-out rate of 15.0 % increased the sample size to 1380. EpiInfo version 6 was used to calculate sample size. Further, for valid comparisons and to ensure representivity of the sample, and to minimize variation within the groups, the children were stratified according to the three age categories, 0-5 months, 6-11 months
and 12-24 months. It was required that at least an equal number of children be entered into the study for each age group. However due to time and financial constraints this number of study subjects could not be realized (See Chapter 6: Discussion, study limitations on page 96). The number of study subjects recruited per site is shown in Table 5.1 on page 44.

4.5. Qualitative study component

4.5.1. Study design

A qualitative component was adopted using the exploratory method of focus group discussions.

4.5.2. Study population and sampling

Twenty-seven mothers/caregivers between the ages of 17–35 years, whose children completed the study from first visit to fourth visit, were purposively sampled. This was to allow for the selection of information-rich subjects for focus group discussion.7 Five focus group discussions were conducted, two with mother/caregivers from trained health facilities and another two with mothers/caregivers from untrained health facilities and one group with mothers/caregivers from a community post. Trained health facilities sampled were Kanyama, Mtendere while untrained health facilities sampled included Bauleni and Kamwala and the community post sampled was Chitukuko.

4.6. Data collection instruments

Various instruments were developed for data collection and monitoring the progress of the children entered in the study (details below and see appendices). The instruments used for data collection were a combination of both components - qualitative and quantitative. The idea was that a combination of both components would strengthen the quality of data collected. Firstly the quantitative data collection tools are described below followed by the qualitative component tools.
4.6.1. Quantitative data collection instruments

4.6.1.1. Mothers'/caregivers’ questionnaire on knowledge of GMP

This was to assess the mothers'/caregivers’ understanding related to growth monitoring issues. The questionnaire included details about the child’s date of birth taken from the under-five card and confirmed verbally with the mother/caregiver, weight at birth, name of both the child and mother, address, weight on recruitment and recumbent length, and reason for bringing the child for under-five clinic on recruitment day (See appendix 3 (A) on page 113). Other details included history and duration of breastfeeding and, introduction of other foods, what these foods were, how many times the child had been fed in the last 24 hours and the type of foods that had been consumed. Other information included frequency of attendance at the health facility for weighing. It also included what kind of information health workers gave to the mother concerning the child’s growth curve and if she had received any counselling.

4.6.1.2. Mothers/caregivers socio demographic questionnaire

This questionnaire was administered to the mother/caregiver and gathered information on socio-economic and demographic status, such as marital status, source of income, education level, size and type of housing, source of drinking water and type of available toilet (See appendix 3 (B) on page 119).

4.6.1.3. In-depth questionnaire for health facility manager

A questionnaire was designed to obtain a more in-depth understanding of the views of the managers regarding the growth monitoring and promotion programme in operation at their health facilities (See appendix 6 on page 132). Knowledge on growth monitoring and promotion was assessed using open-ended questions and the perceived adequacy of personnel trained in growth monitoring promotion.

4.6.1.4. Health staff and Community health worker’s questionnaires

These structured questionnaires for health staff and community health workers were similar. They were administered in order to assess the health workers’ and community
health worker’s knowledge, attitudes and practices on growth monitoring and promotion. Items such as health worker’s knowledge about completing a new under-five growth card, the reading and plotting of weights, interpretation of the growth curve as well (See appendix 4 and 5 on pages 122 and 127). More information was also gathered on the weighing schedule for 0-2 years and those aged 3-5 years. The fieldworkers also observed counselling skills. Each questionnaire had a component of how often these cadres related with each other and in which areas they worked together, the problems they faced and their recommendations for improving the programme.

4.6.2. Qualitative data collection instruments

4.6.2.1. Focus group discussions checklist

A focus group discussion checklist was used to gather in-depth information from 5 separate groups, each comprised 6-8 mothers as key informants or expert participants who had children who completed the study period (See appendix 7 on page 135). Information being sought was focused on aspects pertaining to their perception of the importance of growth monitoring and promotion. Further information was sought on whether they were told anything on the growth of their children by health providers, if they practiced what they were told and if not, what barriers there were in implementing these practices. Other information gathered related to the feasibility of bringing their children for regular weighing sessions and whether or not what they thought could be done to improve the weights of their children.

4.6.2.2. Observations checklist

The field staff made observations on various issues such as weight measurements. These included how the scale was set and how the child was weighed and if they were recorded correctly or incorrectly and if mothers/caregivers were assisted in putting the child in the bag (See appendix 8 on page 137). Information on reading the scale was also observed, plotting and interpretation of weight and if any counselling was done and where it was conducted. If any counselling cards were used when counselling the mother and if the information was relevant.
4.6.3. Definition and purpose of focus group discussion

A focus group involves bringing together a small number of people with common experiences or characteristics to participate in a planned discussion facilitated by a moderator/researcher so that ideas, thoughts and perceptions on a topic of interest are explored in detail. For the current study, the purpose of holding focus groups was to establish a deeper understanding of aspects pertaining to the perceptions of mothers'/caregivers' knowledge, attitudes and practices on growth monitoring and promotion at selected health facilities and community posts. The focus group discussion also served as a quality control mechanism as participants were able to hear each other's responses, and make additional comments beyond their own original responses, a process that also eliminated false or extreme views.

4.6.4. The focus group discussion preparations

Managers from four health facilities were informed of the focus group discussions (FGDs) to be held at their facility premises and community post. Arrangements for a venue were made and a suitable date and time chosen taking into consideration the mothers'/caregivers' availability and free time. Selected mothers/caregivers were informed about the FGDs at least a week before the planned date and they were again reminded a day before the discussions. They were also informed of the date/day, venue and the time of focus group discussion.

The investigator moderated all the focus group discussions using a pre-structured focus group discussion guide. Although the investigator had preferred to document the responses using both audio recorded and written notes, it was not possible to acquire a recorder. Two previously trained field officers assisted with the focus group discussions and took notes as the discussions proceeded. All focus group discussions were conducted in Chinyanja and/ or Cibemba, depending on the mother's/caregiver's choice of language.

Information gathered from the focus group discussions related to mothers'/caregivers' perceptions of the importance of bringing their children to the under-five clinic, the importance of monitoring the growth of children, the type of information health workers
gave mothers/caregivers on the growth of their children, and whether or not mothers/caregivers found the information provided was useful. Further information was also collected on whether mothers/caregivers practiced what they were told by health workers, the feasibility of bringing children for under-five clinics, barriers mothers/caregivers faced in implementing growth promoting practices and what they thought could be done to improve the growth of their children.

4.6.5. The process

Mothers/caregivers helped themselves to refreshments on arrival at the venue. Once all the participants were settled, the moderator (investigator) started the discussion by firstly formally welcoming and thanking the mothers/caregivers for finding time to attend the focus group. The moderator made thereafter-formal introductions and the assistants and each mother/caregiver introduced herself. Mothers/caregivers were informed that participation was voluntary, and they were assured that the focus group discussions would remain confidential, so as to facilitate the discussion to be more open-minded. Participants were asked whether there were any objections to the assistants taking notes and were told that the assistants would not take part in the focus group discussion. No objections were raised. Thereafter, the topic of growth monitoring and promotion was introduced and the reason for conducting a focus group discussion was mentioned.

The discussions were started by the moderator posing the question, “Let us start by you giving me your views on whether you think it is important to bring your children for under-five clinic?” and if so why? For each posed question the moderator let the discussion flow, unless the discussion strayed from the topic under discussion, until the discussion reached information saturation. The moderator only concluded the discussion after no more responses were forthcoming from the mothers/caregivers. The moderator summarized the discussion at the end and asked participants if they agreed to the discussion summary points or if they had additional comments. Each FGD lasted approximately 1½ hours.
4.7. Execution of field work

4.7.1. Training of field workers

Four newly qualified graduates in nutrition were recruited as research field staff and trained by the investigator with the assistance of a senior nutritionist who was also the fieldwork supervisor working for the Lusaka District Health Management Team. Two weeks prior to the survey, the field staff were trained for two days both theoretically and hands on covering all the necessary critical issues relating to aspects of administering the questionnaires and taking the measurements. Emphasis was placed on taking the recumbent length, which was a new technique to the field staff. Recumbent length was practiced on children after removing the child’s headgear and shoes, and was done by 2 members of the study team co-operatively during training and in study. The fieldworkers only recorded the length after taking an average of two length measurements. Training notes were given as well as diagrammatic presentations on taking weight and recumbent length.\textsuperscript{1,2,3,9,58} The purpose of training was to standardize the techniques for taking measurements and conducting interviews so as to minimize errors and thereby reduce bias.

4.7.2. Field testing and piloting of tools

After training, the data collection tools were first field-tested and then piloted at the Civic centre clinic during a routine growth monitoring session at the clinic. It included 8 children with their mothers/caregivers, the health facility manager and 4 health staff.

All weaknesses and gaps identified in the field-testing were incorporated in the tools before piloting the revised instruments. The purpose of the piloting was to ascertain the suitability of the questionnaires by the interviewer and the respondents. The data from the field-testing and pilot study were not included as part of the research data analysed for this study.

Four days prior to starting the research, all health facility managers of the selected health facilities were visited by the investigator and informed of the intended study, explaining its aim and objectives, and their full cooperation obtained.
4.8. Measurements

4.8.1. First visit/ baseline

Anthropometric measurements collected at first visit included weight and recumbent length for each child. In addition data on age in months and gender were also collected as part of the child statistics using a structured exit questionnaire administered to the mothers/caregivers (see later). Weight was measured after removing all clothing such as shoes, head clothes using a portable Salter hanging scale read to the nearest 100 grams. Recumbent length measurements were done by two members of the field team using a measuring mat and were read to the nearest 0.1 cm and again after removing heavy clothes, shoes and headgear. Information from health facility managers on whether they were trained in GMP/IMCI, numbers of trained staff in GMP/IMCI at their health facilities was collected. More information was still collected from health workers and community health workers on their knowledge, attitude and practices (KAP) on GMP.

4.8.2. Second and third visits

Monthly interval weight measurements were taken after the first visit weight. Weights were taken on the following date corresponding to their previous visit. If a child missed an appointment, field officers did follow-ups and the child was weighed within a week or on a date closest to the missed appointment date.

4.8.3. Fourth visit

This was the final contact with the child. Anthropometric measurements of both weight and recumbent length were repeated for each child that had completed the entire study period without missing any appointments throughout the study period. After this the child was discharged from the study. These were collected using the Salter hanging scale and length mat. Age and gender were again collected as part of the demographic characteristics on the child using an exit questionnaire for mothers/caregivers (see details later). The mothers/caregivers questionnaire was repeated to measure any changes that could have occurred in the knowledge of mother/caregiver, care and feeding practices of the child from the first exit interview at baseline. The data of the children who did not go
through the entire study period was kept for analysis at the various points in time. Follow-up visits were conducted in the case of children who had missed an appointment at a date nearest to the appointment date or within a week of the appointment date.

4.9. Data management

4.9.1. Data entry

The quantitative raw data was transferred from the questionnaires to an Access database framework and then exported to an Excel master spreadsheet. Two previously trained field staff recorded the qualitative data field notes from the focus group discussions and transcribed these immediately on the day of the data collection.

4.9.2. Data cleaning

To minimize errors in the data, the investigator and supervisor did the day-to-day checking of completed quantitative questionnaires for any inconsistencies. The primary investigator performed the final data cleaning on every record that was entered. For the qualitative component, all the focus group data notes were self analysed by the moderator through transcription of all field notes. Transcription was done by extracting relevant emerging patterns, categories and sub-categories, as well as notable verbatim quotes after reading the discussion notes several times.

4.10. Data analysis

4.10.1. Quantitative data analysis

Epi Info version 6 and STATA statistical analytical version 6 packages were used to perform the data analyses. All data from the Excel master spreadsheet format were transferred to Epi Info where anthropometric measurements were converted and expressed as Z-Scores (Standard deviations) before they were interpreted. The cut off point -2 SD was used as the determinant for severely and moderately undernourished and those who were growth faltering. Further statistical tests were performed on the data using ANOVA statistical test, paired t-test and Chi-squared test to look at the statistical differences in the anthropometric measurements as well as for categorical data. The
mean Z-score change differences were calculated for weight and length for differences between the different follow-up visits. ANOVA was used to determine any associations between the trained and untrained health facilities and community post. The statistical analyses used the level of significance p <0.05 to assess whether or not the association was due to chance.

4.10.2. Qualitative data analysis

All the qualitative data notes from focus groups were self analysed by the moderator through transcription of all field notes. Data triangulation was used for analysis of data and it is a method that enables bringing a variety of data sources together. Data triangulation has the advantage of combining qualitative and quantitative data sets and it brought out emerging patterns and linkages between the quantitative and qualitative data. Data triangulation is also important in strengthening a study design and it increases both the validity and reliability of assessing data as well as determining if the content is consistent.1

4.11. Validity, reliability and quality control

4.11.1. Validity of quantitative data

Portable Salter hanging weighing scales, which were being used to measure weights, had never been calibrated against any known weights for standardizing and assessing the accuracy of the scales, as this was non-existent in all the health facilities included in the study. As part of quality control, before each weighing session the scale was calibrated by zeroing it. In addition, field staff were trained in setting the scale, weighing, reading, plotting and growth interpretation and how to measure the recumbent length so as to standardize the data collection techniques and minimize error. However, due to study logistics, it was not possible for the same field worker to perform all of the follow-up measurements on the same child.

4.11.2. Validity of qualitative data

A summary of all the discussion points agreed on during member checking was given at the end of each FGDs before closing and participants were asked if they agreed to these
discussion summary points. Two field staff who were trained before the commencement of the main study assisted with the focus group discussions as note-takers and they recorded the deliberations of the discussions as they unfolded, to increase reliability rather than rely on memory. The information of the two independent note-takers were transcribed and compared before the final transcript was finalized.

4.10.3. Reliability and quality control

The data collection was closely monitored throughout the study period by the investigator and the fieldwork supervisor. Scales were calibrated daily before weighing sessions commenced. On a day-to-day basis the investigator and/or the fieldwork supervisor checked completed questionnaires for any errors and inconsistencies. Translation of some of the technical terms into vernacular was done so that field officers used a standard language when administering questionnaires and dealing with respondents.

Fieldwork was conducted mainly in the mornings at the health facilities and, in a few instances, in the afternoons at some of the community posts. Measurements were taken always at the same time of the day, and these were adhered to even for follow-ups so as to minimize the effect of diurnal variations i.e. if a child was recruited in the morning all of the next following appointments were made in the mornings. The field staff spoke at least one or both of the commonly used and understood local languages in Lusaka fluently, (Cinyanja or Cibemba).

The study instruments were field tested and piloted before the main study commenced. Identified weakness and gaps were addressed before the study tools were finalized.

4.12. Ethical approval

The University of Cape Town Ethics and Research committee granted approval for the study proposal, as did the Research and Ethics committee in Zambia. Thereafter Official permission to conduct the study in the selected sites was granted by the Lusaka District Health Management Board authority, which is accountable for the provision of health services in the selected health facilities where the study was conducted.
Written informed consent was obtained from all the study participants. Mothers/caregivers were required to provide consent for their children to participate in the study. Health providers and community health workers participating in the study were also required to provide written consent participation.

Before the commencement of focus group discussions, mothers/caregivers were informed that participation was voluntary, and they were assured that the focus group discussions would remain confidential, so as to facilitate the discussion to be more open-minded.
CHAPTER 5: RESULTS

The first section of the results deals with data pertaining to the first objective namely: "To determine whether growth monitoring and promotion outcomes among children aged 0-2 years are improved with training of health workers at health facilities and community posts within the primary health care sector."

The results are presented for data collected at first (baseline), second, third and fourth visits. Results at each of the subsequent visits are compared with the first visit to determine any changes in anthropometric status. The results of children recruited from the trained health facilities, including community posts, are compared with those of children from the untrained health facilities.

The sample size, and distribution by site is shown in Table 5.1.

<table>
<thead>
<tr>
<th>Trained Facilities</th>
<th>No. (%)</th>
<th>Untrained facilities</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanyama</td>
<td>184 (26.4)</td>
<td>Chawama</td>
<td>84 (12.0)</td>
</tr>
<tr>
<td>Mtendere</td>
<td>51 (7.3)</td>
<td>Kabwata</td>
<td>78 (11.2)</td>
</tr>
<tr>
<td>Kamwala</td>
<td>65 (9.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauleni</td>
<td>159 (22.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community posts</td>
<td>77 (11.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>536 (76.8)</td>
<td></td>
<td>162 (23.2)</td>
</tr>
</tbody>
</table>

5.1.1. First visit (baseline)

5.1.1.1. Characteristics of sites and sample population

Of the 700 children recruited in the study, two (0.3 %) were excluded from the analysis after it was established that they were older than 2 years. Of the children, 536 (76.8 %) were recruited from trained health facilities (including community posts) and 162 (23.2 %) from untrained health facilities. Children were conveniently sampled, based on the total number of population served by the health facility as described earlier in Chapter 4 on page 23.
### 5.1.2. Socio-demographic characteristics of mothers/caregivers and children

Data were collected from mothers/caregivers regarding their age, marital status, educational status, source of income, type of housing, source of drinking water and type of sanitation (see Table 5.2).

| Table 5.2 Socio-demographic characteristics of mothers/caregivers and children: |
|--------------------------------------|------------------|------------------|------------------|------------------|
| N (%)                                | Health facility  | Community        | Total sample     |
|                                      | Trained          | Untrained        | Post             | N = 698 (%)      |
| Characteristics                      | N = 459          | N = 162          | N = 77           |                  |
| Children: -                          |                  |                  |                  |                  |
| Gender                               |                  |                  |                  |                  |
| Boys                                 | 221 (48.0)       | 81 (50.0)***     | 46 (59.7)***     | 348 (49.9)       |
| Girls                                | 238 (52.8)       | 81 (50.0)        | 31 (40.3)        | 350 (50.1)       |
| Age group (months)                   |                  |                  |                  |                  |
| 0-5                                  | 55 (12.0)        | 19 (12.0)        | 5 (6.5)          | 79 (11.0)        |
| 6-11                                 | 172 (37.5)       | 66 (41.0)        | 34 (44.2)        | 272 (39.0)       |
| 12-24                                | 232 (50.5)       | 77 (47.0)        | 38 (49.3)        | 347 (50.0)       |
| Mean age                             | 12.1 (SD=5.4)    | 12.5 (SD=5.5)    | 11.9 (SD=5.0)    | 12.2 (SD=5.4)    |
| Mean birth weight                    | 3.0 (SD=0.36)    | 3.0 (SD=0.38)    | 2.8 (SD=0.7)     | 3.0 (0.36)       |
| Mean low birth weight                | 2.4 (SD=0.1)     | 2.4 (SD=0.1)     | 2.5 (SD=0)       | 2.4 (SD=0.1)     |
| Low birth weight (%)                 | 27 (5.8)         | 5 (3.1)          | 1 (1.3)          | 33 (4.7)         |
| Mother's/caregivers:                 |                  |                  |                  |                  |
| Age group (years)                    |                  |                  |                  |                  |
| 10-19                                | 90 (19.6)        | 14 (8.6)         | 10 (13.0)        | 117 (17.0)       |
| 20-29                                | 292 (63.6)       | 126 (77.8)       | 52 (67.5)        | 462 (66.2)       |
| 30-39                                | 73 (15.8)        | 20 (12.4)        | 13 (17.0)        | 111 (16.0)       |
| 40-49                                | 4 (1.0)          | 2 (1.2)          | 2 (2.5)          | 8 (1.0)          |
| Mean age                             | 24.3 (SD=5.6)    | 24.7 (SD=4.7)    | 25.3 (SD=6.0)    | 24.5 (SD=6.0)    |
| Marital status                       |                  |                  |                  |                  |
| Single                               | 42 (9.1)***      | 26 (16.0)*       | 6 (8.0)          | 74 (10.6)        |
| Married                              | 407 (88.7)       | 131 (80.8)       | 68 (88.0)        | 606 (86.8)       |
| Widowed                              | 7 (1.5)          | 4 (2.4)          | 2 (3.0)          | 13 (1.9)         |
| Divorced                             | 3 (0.7)          | 1 (0.6)          | 1 (1.3)          | 5 (0.7)          |
| Highest education level              |                  |                  |                  |                  |
| Primary schooling                    | 282 (61.4)****   | 61 (37.6)****    | 38 (49.4)****    | 381 (54.6)       |
| Secondary schooling                  | 132 (28.8)       | 73 (45.0)        | 31 (40.2)        | 236 (33.8)       |
| Post school qualification            | 11 (2.4)         | 19 (11.7)        | 4 (5.2)          | 34 (4.9)         |
| No schooling                         | 34 (7.4)         | 9 (5.7)          | 4 (5.2)          | 47 (6.7)         |
### Table 5.2 continued

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Health facility</th>
<th>Community Post</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trained N = 459</td>
<td>Untrained N = 162</td>
<td>Post N = 77</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depends on spouse</td>
<td>317 (69.0)**</td>
<td>100 (61.7)*</td>
<td>55 (71.4)£</td>
</tr>
<tr>
<td>Formal job</td>
<td>14 (3.0)</td>
<td>16 (9.8)</td>
<td>3 (4.0)</td>
</tr>
<tr>
<td>Informal job</td>
<td>5 (1.0)</td>
<td>10 (6.2)</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>Marketer/vendor</td>
<td>76 (17.0)</td>
<td>15 (9.3)</td>
<td>6 (7.8)</td>
</tr>
<tr>
<td>Others</td>
<td>47 (10.0)</td>
<td>21 (13.0)</td>
<td>12 (15.5)</td>
</tr>
<tr>
<td><strong>No. of rooms per house</strong>§</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 room</td>
<td>101 (22.0)***</td>
<td>16 (9.9)**</td>
<td>7 (9.0)**</td>
</tr>
<tr>
<td>2 rooms</td>
<td>263 (57.0)</td>
<td>69 (42.6)</td>
<td>44 (57.0)</td>
</tr>
<tr>
<td>3 rooms</td>
<td>45 (10.0)</td>
<td>31 (19.1)</td>
<td>12 (16.0)</td>
</tr>
<tr>
<td>&gt; 3 rooms</td>
<td>50 (11.0)</td>
<td>46 (28.4)</td>
<td>14 (18.0)</td>
</tr>
<tr>
<td><strong>Type of housing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brick/cement/corrugated iron roof/asbestos with electricity</td>
<td>155 (33.7)***</td>
<td>98 (60.5)**</td>
<td>30 (39.0)**</td>
</tr>
<tr>
<td></td>
<td>304 (66.3)</td>
<td>64 (39.5)</td>
<td>47 (61.0)</td>
</tr>
<tr>
<td><strong>Access to drinking water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tap/piped</td>
<td>443 (96.0)</td>
<td>158 (97.5)</td>
<td>77 (100.0)</td>
</tr>
<tr>
<td>Well</td>
<td>3 (1.0)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Borehole</td>
<td>13 (3.0)</td>
<td>4 (2.5)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Type of toilet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush toilet in house</td>
<td>13 (2.8)***</td>
<td>48 (29.6)**</td>
<td>3 (4.0)**</td>
</tr>
<tr>
<td>Communal flush toilet</td>
<td>15 (3.3)</td>
<td>6 (3.7)</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Pit latrine in yard</td>
<td>160 (35.0)</td>
<td>54 (33.3)</td>
<td>29 (37.6)</td>
</tr>
<tr>
<td>Communal pit latrine</td>
<td>266 (57.9)</td>
<td>53 (32.7)</td>
<td>43 (56.0)</td>
</tr>
<tr>
<td>Uses neighbour’s toilet</td>
<td>5 (1.0)</td>
<td>1 (0.6)</td>
<td>1 (1.2)</td>
</tr>
</tbody>
</table>

**p < 0.001 and * P < 0.05; X^2** significance test for differences between sites.  
a = trained health facility vs. untrained health facility  
b = trained health facility vs. community posts  
c = untrained health facility vs. community posts  
§ Excludes kitchen, bathroom and toilet.

The results indicated a similar gender distribution for the children with 348 (49.9 %) boys and 350 (50.1 %) girls. The gender distribution was similar for trained and untrained sites with 221 (48.0 %) boys and 238 (52.0 %) girls at trained facilities and 81 (50.0 %) each of boys and girls at untrained facilities. At community posts there were more boys (n =
46 (59.7 %)) than girls (n = 31 (40.3 %)). There were significant differences in gender distribution between the community posts and trained and untrained sites (p < 0.001).

Only 79 (11.0 %) of the children were aged between 0-5 months, while 272 (39.0 %) were 6-11 months and 347 (50.0 %) were 12-24 months old. Similar proportions of children at the trained and untrained health facilities were between 0-5 months, 55 (12.0 %) compared to 19 (12.0 %), respectively. There were also similar proportions of children at the trained health facilities compared with the untrained health facilities that were aged between 12-24 months, 232 (50.5 %) compared with 77 (47.0 %), respectively. The mean age of the children was 12.2 (SD = 5.4) months, with a range of 2-24 months. Age did not differ significantly between the trained and untrained health facilities, (mean age = 12.1 (SD = 5.4) months, with a range of 2 – 24 months; and 12.5 (SD = 5.5) months, with a range of 2-23 months, respectively). Children from the community post had a mean age of 11.9 (SD = 5.0) months. No significant differences were found in birth weights between children from trained and untrained health facilities (mean = 3.0 (SD = 0.36) kg and 3.0 (SD = 0.38)) kg, respectively. However, children from community posts had a significantly lower mean birth weight of 2.8 (SD = 0.7) kg (p < 0.001).

Of the 698 children seen at baseline, 69 (9.8 %) had been home deliveries, and no difference in proportions were found between trained and untrained health facilities (n = 48 (10.5 %) and (n = 17 (10.5 %)), respectively, compared to only four (5.1 %) home deliveries from community posts. There were 27 (5.8 %) low birth weight (LBW) children from trained health facilities with weights ranging between 2.1 and 2.5 kg. Untrained health facilities had only five (3.1 %) low birth weight children, with weights ranging between 2.3 and 2.5 kg, while only one LBW child (1.3 %, weight = 2.5 kg) came from the community posts.

Only eight (1.0 %) mothers/caregivers were aged between 40-49 years while the majority, 462 (66.2 %) were between 20-29 years. The mean ages of mothers at trained health facilities, untrained health facilities and community posts were 24.3 (SD = 5.6) years, (range = 14 to 40 years), 24.7 (SD = 4.7) years, (range 17 to 41 years) and 25.3
(SD = 6.0) years, (range 16 to 45 years), respectively. There was no significant difference for mothers'/caregivers' age between trained and untrained health facilities.

Of the mothers/caregivers, 606 (86.8 %) were married, 74 (10.6 %) were single, 13 (1.9 %) were widowed and five (0.7 %) were divorced. A significantly higher proportion of mothers at trained health facilities (n = 407, 88.7 %) and community posts (n = 68, 88.0 %) compared with those at untrained health facilities (n = 131 (80.8 %) were married (p < 0.05)).

Of the mothers/caregivers, 381 (54.6 %) had primary school education, 236 (33.8 %) had secondary school education, while only 34 (4.9 %) had post secondary school qualifications while 47 (6.7 %) had received no formal schooling. The trained health facilities seemed to comprise the least educated group of mothers; and significant differences in education levels were found between trained and untrained health facilities (p <0.001) and also between trained facilities and community posts (p < 0.05).

Regarding socio-economic status, the majority of mothers/caregivers, 472 (67.6 %) depended on their spouses for income. This was the case for 317 (69.0 %) mothers/caregivers from trained health facilities, 100 (61.7 %) from untrained health facilities and 55 (71.4 %) from community posts. Of the 698 mothers/caregivers, 97 (13.9 %) were marketers/vendors, while 80 (11.5 %) received income from other sources such as parents, uncles and other relatives. Those subjects who were employed in the formal sector or held casual jobs numbered 33 (4.7 %) and 16 (2.3 %), respectively. There was a significant difference in sources of household income between mothers from the trained and untrained health facilities (p < 0.005).

The majority of mothers/caregivers (n = 376 (53.8 %)) lived in 2-roomed houses (excluding kitchen, bathroom and toilet) while 124 (17.8 %) and 198 (28.4 %) lived in 1-roomed and 3-or-more roomed houses, respectively. The mean number of rooms per household was 1.6 (SD = 0.52), ranging from 1 to 4 rooms. A significantly higher percentage of mothers from the trained health facilities lived in one-roomed houses compared to those from other sites (p < 0.001).
Two hundred and eighty three (40.5 %) subjects lived in electrified houses made from brick, cement and corrugated iron or asbestos roofing, while the majority (n = 415 (59.5 %)) lived in the same type of housing made from brick, cement and iron or asbestos roofing but without electricity. More mothers/caregivers, (n = 98 (60.5 %)) from untrained health facilities lived in houses with electricity, compared to subjects from either trained facilities (p < 0.001) or community posts, (p < 0.005).

Regarding access to drinking water, only three (0.4 %) and 17 (2.4 %) subjects were receiving their water from a well or borehole, respectively. Six hundred and seventy eight mothers/caregivers (97.1 %) had access to tap/piped water, which included 443 (96 %) of the mothers from trained, 158 mothers (97.5 %) from untrained health facilities, and 77 (100.0 %) mother from the community posts. There was no significant difference regarding access to drinking water between the sites.

With regard to sanitation, 362 (51.8 %) subjects used communal pit latrines, and 243 (34.8 %) used their own pit latrines. Only 22 (3.2 %) and 64 (9.2 %) had access to a communal or their own flush toilet, respectively, while 7 (1.0 %) made use of a neighbour’s toilet. There were significant differences regarding sanitation facilities, particularly in availability of flush toilets in the house between trained and untrained health facilities and untrained health facilities and community posts (p < 0.001).

5.1.3. Anthropometric status of children at first visit (baseline) by facility

The anthropometric status of children at baseline is shown, according to site of recruitment, in Table 5.3. A total of 30 (4.3 %) children were severely underweight (Z-score weight-for-age < -3), 103 (14.7 %) were moderately underweight (Z-score weight-for-age of -3 to < -2) and 565 (81.0 %) were growth faltering (Z-score weight-for-age > -2). The percentage distribution of severely underweight children was similar from all sites; 4.4 %, 4.3 % and 4.0 % from trained, untrained health facilities and community posts respectively. The majority of children, 374 (81.6 %), 131 (80.8 %) and 60 (77.9 %) from trained and untrained health facilities and community posts, respectively, were growth faltering.
Regarding wasting, only one child (0.1 %) who was from an untrained health facility, was severely wasted, (Z-score weight-for-length < -3). A total of 20 (2.8 %) children were moderately wasted (Z-score weight-for-height -3 to < -2). There were 7 (4.3 %) moderately wasted children from untrained health facilities compared to 9 (2.0 %) and 4 (5.1 %) from trained health facilities and community posts, respectively.

Of the 698 children, 95 (13.6 %) were severely stunted (Z-score height-for-age < -3), and 177 (25.3 %) were moderately stunted (Z-score height-for-age -3 to < -2). The percentage of severely stunted children was similar for trained and untrained health facilities, (13.5 % for both trained and untrained health facilities) as well as for community posts (14.3 %). There were similar percentages of moderately stunted children from trained health facilities, 123 (26.8 %) and untrained health facilities, 40 (24.7 %) compared to 14 (18.1 %) from community posts.
Table 5. 3 Anthropometric status of children at first visit (baseline) by facility: N = 698

<table>
<thead>
<tr>
<th>Weight-for-age</th>
<th>Z-score: category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;-3</td>
<td>-3 to &lt;-2</td>
</tr>
<tr>
<td>Trained health facilities</td>
<td>20 (4.4)</td>
<td>65 (14.2)</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>7 (4.3)</td>
<td>24 (14.8)</td>
</tr>
<tr>
<td>Community posts</td>
<td>3 (4.0)</td>
<td>14 (18.1)</td>
</tr>
<tr>
<td>Total</td>
<td>30 (4.3)</td>
<td>103 (14.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight-for-length</th>
<th>Z-score: category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trained health facilities</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Untrained health facilities</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td></td>
<td>Community posts</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1 (0.1)</td>
<td>20 (2.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length–for-age</th>
<th>Z-score: category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trained health facilities</td>
<td>62 (13.5)</td>
</tr>
<tr>
<td></td>
<td>Untrained health facilities</td>
<td>22 (13.5)</td>
</tr>
<tr>
<td></td>
<td>Community posts</td>
<td>11 (14.3)</td>
</tr>
<tr>
<td>Total</td>
<td>95 (13.6)</td>
<td>177 (25.3)</td>
</tr>
</tbody>
</table>

* X² test for significance between facilities, p < 0.05
5.1.4. Anthropometric status of children, by age, at first visit (baseline) by age

The anthropometric status of children, by age, at baseline was compared between trained and untrained health facilities and community posts, details of which are shown in Tables 5.4, 5.5 and 5.6, respectively. Although there were fewer children in the 0-5 month age category than in the 6-11 and 12-24 month categories from all sites, it was evident that growth faltering was prevalent in early infancy and across all age categories.

Only one child (0.6%) in the 6-11 month age category, from an untrained health facility, was severely wasted.
<table>
<thead>
<tr>
<th>Trained facilities</th>
<th>Mean Z-Score by age</th>
<th>Z-score: Number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;-3</td>
<td>-3 to &lt;-2</td>
<td>-2 to &lt;-1</td>
</tr>
<tr>
<td>Weight-for-age</td>
<td>0 - 5</td>
<td>0.31 (SD=0.9)</td>
<td>2 (10.0)</td>
</tr>
<tr>
<td></td>
<td>6 - 11</td>
<td>-0.7 (SD=1.1)</td>
<td>10 (50.0)</td>
</tr>
<tr>
<td></td>
<td>12 - 24</td>
<td>-1.5 (SD=1.1)</td>
<td>8 (40.0)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.0 (SD=1.2)</td>
<td>20 (43.3)</td>
<td>65 (14.2)</td>
</tr>
<tr>
<td>Weight-for-length</td>
<td>0 - 5</td>
<td>1.4 (SD=1.3)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6 - 11</td>
<td>0.5 (SD=1.3)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>12 - 24</td>
<td>-0.1 (SD=1.0)</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0.3 (SD=1.3)</td>
<td>0</td>
<td>9 (2.0)</td>
</tr>
<tr>
<td>Length-for-age</td>
<td>0 - 5</td>
<td>-0.1 (SD=1.3)</td>
<td>5 (8.1)</td>
</tr>
<tr>
<td></td>
<td>6 - 11</td>
<td>-1.3 (SD=1.5)</td>
<td>26 (41.9)</td>
</tr>
<tr>
<td></td>
<td>12 - 24</td>
<td>-2.3 (SD=1.5)</td>
<td>31 (50.0)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.7 (SD=1.5)</td>
<td>62 (13.5)</td>
<td>123 (26.8)</td>
</tr>
</tbody>
</table>
Table 5.5 Anthropometric status of children, by age, at 1st visit (baseline) from untrained facilities

<table>
<thead>
<tr>
<th>Untrained facilities</th>
<th>Mean Z-score by age</th>
<th>Z-score: Number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; -3</td>
<td>-3 to -2</td>
<td>-2 to &lt; -1</td>
</tr>
<tr>
<td>Weight-for-age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–5</td>
<td>0.6</td>
<td>2 (28.6)</td>
<td>3 (12.5)</td>
</tr>
<tr>
<td>6–11</td>
<td>-0.5</td>
<td>3 (42.9)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>12–24</td>
<td>-1.6</td>
<td>2 (28.6)</td>
<td>15 (62.5)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.0</td>
<td>7 (43.3)</td>
<td>24 (14.8)</td>
</tr>
<tr>
<td>Weight-for-length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–5</td>
<td>1.4</td>
<td>4 (16.0)</td>
<td>4 (8.5)</td>
</tr>
<tr>
<td>6–11</td>
<td>0.6</td>
<td>1 (100.0)</td>
<td>8 (32.0)</td>
</tr>
<tr>
<td>12–24</td>
<td>-0.4</td>
<td>6 (85.7)</td>
<td>13 (52.0)</td>
</tr>
<tr>
<td>Total</td>
<td>0.3</td>
<td>7 (4.3)</td>
<td>25 (15.4)</td>
</tr>
<tr>
<td>Length-for-age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–5</td>
<td>-0.7</td>
<td>4 (18.1)</td>
<td>5 (12.5)</td>
</tr>
<tr>
<td>6–11</td>
<td>-1.3</td>
<td>6 (27.2)</td>
<td>18 (45.0)</td>
</tr>
<tr>
<td>12–24</td>
<td>-2.1</td>
<td>12 (54.5)</td>
<td>17 (42.5)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.7</td>
<td>22 (13.5)</td>
<td>40 (24.7)</td>
</tr>
</tbody>
</table>
Table 5. 6 Anthropometric status of children, by age, at 1st visit (baseline) from the community post

<table>
<thead>
<tr>
<th>Community post</th>
<th>Weight-for-age</th>
<th>Z-score by age</th>
<th>Z-score: Number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt; -3</td>
<td>-3 to &lt; -2</td>
<td>-2 to -1</td>
</tr>
<tr>
<td>0–5</td>
<td>-1.0 (SD=1.2)</td>
<td>0</td>
<td>1 (25.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>6–11</td>
<td>-1.0 (SD=1.2)</td>
<td>1 (2.3)</td>
<td>6 (17.1)</td>
<td>8 (22.8)</td>
</tr>
<tr>
<td>12–24</td>
<td>-1.0 (SD=1.3)</td>
<td>2 (5.2)</td>
<td>7 (18.4)</td>
<td>12 (31.6)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.0 (SD=1.2)</td>
<td>3 (3.9)</td>
<td>14 (18.1)</td>
<td>22 (28.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight-for-length</th>
<th></th>
<th></th>
<th>Z-score: Number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>1.1 (SD=1.0)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6–11</td>
<td>0.6 (SD=1.4)</td>
<td>0</td>
<td>3 (8.6)</td>
<td>4 (11.4)</td>
</tr>
<tr>
<td>12–24</td>
<td>0.2 (SD=1.2)</td>
<td>0</td>
<td>1 (2.6)</td>
<td>8 (21.0)</td>
</tr>
<tr>
<td>Total</td>
<td>-0.2 (SD=1.0)</td>
<td>0</td>
<td>4 (5.2)</td>
<td>12 (15.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length-for-age</th>
<th></th>
<th></th>
<th>Z-score: Number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>-1.3 (SD=0.8)</td>
<td>0</td>
<td>1 (25.0)</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td>6–11</td>
<td>-1.6 (SD=1.7)</td>
<td>7 (20.0)</td>
<td>5 (14.3)</td>
<td>9 (25.7)</td>
</tr>
<tr>
<td>12–24</td>
<td>-1.7 (SD=1.0)</td>
<td>4 (10.5)</td>
<td>8 (21.0)</td>
<td>18 (47.3)</td>
</tr>
<tr>
<td>Total</td>
<td>-1.6 (SD=1.4)</td>
<td>11 (14.5)</td>
<td>14 (18.1)</td>
<td>28 (36.3)</td>
</tr>
</tbody>
</table>
The nutritional status of the children by Mean Z-score-for-age from all sites indicated that the younger children were better off than the older ones with children from the 0-5 age category having better nutritional status. Children aged 12-24 months from all the three sites seemed to be the worst affected particularly with stunting although the picture was not so different for the 6-11 age category.

### 5.2 Follow-up visits

#### 5.2.1 Response rate

Of the 698 children that were seen at the first visit (baseline), those who returned for the second follow-up visit numbered 438 (63.0 %), while 272 (39.0 %) children attended the third follow-up visit and 181 (26.0 %) children attended the fourth follow-up visit. (See Table 5.7 below).

There was a significantly higher proportion of drop-outs between the first and second visits at the untrained facilities compared to the other two sites ($p < 0.0001$). There was also a significant difference in percentage of drop-outs between the first and third follow-up visits according to type of facility ($p < 0.05$) but no differences between facilities were noted for the proportion of the initial sample who attended the fourth visit (21.0 % - 28.0 % drop-out rates).

<table>
<thead>
<tr>
<th>Health facility</th>
<th>1st</th>
<th>2nd***</th>
<th>3rd*</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained health facilities</td>
<td>459</td>
<td>312 (68.0)</td>
<td>195 (42.5)</td>
<td>127 (28.0)</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>162</td>
<td>80 (49.4)</td>
<td>54 (33.3)</td>
<td>38 (23.4)</td>
</tr>
<tr>
<td>Community posts</td>
<td>77</td>
<td>46 (60.0)</td>
<td>23 (30.0)</td>
<td>16 (21.0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>698 (100)</td>
<td>438 (63.0)</td>
<td>272 (39.0)</td>
<td>181 (26.0)</td>
</tr>
</tbody>
</table>

**$p < 0.0001$ and $p < 0.05$ $X^2$ test indicates significant difference in drop-out rate according to health facility between previous and current visit.**

§ Percent in brackets refer to proportion of baseline sample that attended follow-up visits.
5.2.2. Change in anthropometrical status between follow-up visits

At each of the follow-up visits, the anthropometric status of children was compared between trained and untrained health facilities and community posts to identify the pattern of nutritional status of the children at different points in the study. The change in the weight-for-age Z-score for each child was done at follow-up visits and mean values were then calculated. The change in anthropometric status between the first and second follow-up visits is shown in Figure 5.1 below.

Figure 5.1 Change in mean weight-for-age Z-score at 2nd follow-up visit

The anthropometric status of all children who were seen at both baseline and second visit from all the three sites had deteriorated over time. However, of the three sites, children from trained health facilities had a better anthropometric status for weight-for-age with a change in mean weight-for-age Z-score of -0.14, (SD = 0.34) compared to community posts -0.2 (SD = 0.35) while untrained health facilities were worst off with a change in mean weight-for-age Z-score of -0.27 (SD = 0.32). The X² test indicated that there was a significant difference in the change in mean weight-for-age Z-score for children between trained and untrained health facilities (p < 0.05). The X² test results also indicated a
significant difference in the change in mean weight-for-age Z-score for children between trained health facilities and community posts (p < 0.001).

The results of the change in mean weight-for-age Z-score of the children between the first and third follow-up visits are indicated in Figure 5.2. Again, of the three sites, the change in mean weight-for-age Z-score was -0.26 (SD = 0.5) for the trained health facility, -0.31 (SD = 0.44) for the untrained health facility and -0.47 (SD = 0.7) for the community post. The X² test results indicated that there was a significant difference in the change in mean weight-for-age Z-score for the children between trained health facilities and community posts and between untrained health facilities and community posts (p < 0.05).

Figure 5.2 Change in mean weight-for-age Z-score at 3rd follow-up visit

![Figure 5.2 Change in mean weight-for-age Z-score at 3rd follow-up visit](image)

The anthropometric status of children seen at both first and fourth follow-up visits indicated that, unlike the previous visits, the untrained health facilities had the least deterioration (p < 0.05) in the change in the mean weight-for-age Z-score, (-0.3 (SD = 0.47)), compared to trained health facilities, (-0.5 (SD = 0.6)) and community posts (-0.8 (SD = 0.7)). The change in mean weight-for-length Z-score was -0.5 (SD = 0.6) for trained health facilities and -0.3 (SD = 0.6) for untrained health facilities, compared to -0.9 (SD= 0.6) for community posts. The change in mean length-for-age Z-score for all
the three groups was similar: -0.13 (SD= 0.6) for trained health facilities; -0.15 (SD = 0.6) for untrained health facilities; and -0.17 (SD = 0.4) for community posts.

Figure 5.3 Change in anthropometric status of children at 4th follow-up visit

5.2.3. Anthropometric status of children at each follow-up visit

The prevalence of severe underweight (Z-score < -3 SD) at the second visit at trained and untrained health facilities and community posts was (5.3 %, (n = 23)). The community post had a higher proportion of severely underweight children 8.7 % while the prevalence at trained and untrained health facilities were similar 4.8 % and 5.0 %, respectively. Sixty-one (13.4 %) children were moderately underweight, (Z-score -3 to < -2) of which untrained health facilities had a higher prevalence (18.7 %; n = 15) compared with trained health facilities (13.1 %; n = 41) and community posts (10.8 %; n = 5). The majority of children from all sites (n = 286; 65.2 %) fell into the mild undernutrition category, (Z-score -2 to < -1 and -1 to 0) for underweight. (See appendix 9).

At the third follow-up visit, the prevalence of severely underweight children was 4.0 % (n = 11). Three children (5.6 %) from the untrained health facilities were severely underweight, compared to 7 (3.6 %) of children from trained health facilities and 1 (4.3
% from the community posts. Again, the majority of children from all sites, 187 (68.7 %) fell in the category of moderate and mild undernutrition, Z-score -2 to <-1 and Z-score -1 to 0. (See appendix 10).

At the fourth follow-up visit, 6 % (n = 11) of the children were severely underweight and 1.1 % (n = 2) were severely stunted. Children from community posts had a higher prevalence of moderate underweight, 37.5 % (n = 6) than those from the trained health facilities, 11.8 % (n = 15) and untrained health facilities 15.8 % (n = 6). Length was only measured at first visit and at fourth visit; therefore only underweight indices are shown for second and third visits while underweight, wasting and stunting indices are shown for the fourth visit. (See Table 5.8).
Table 5.8 Anthropometric classifications of children at fourth follow-up visit

<table>
<thead>
<tr>
<th>Weight-for-age</th>
<th>Z-score</th>
<th>Number (%)</th>
<th>N = 181</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; -3</td>
<td>-3 to &lt;=-2</td>
<td>-2 to &lt;-1</td>
<td>-1 to 0</td>
</tr>
<tr>
<td>Trained health facilities</td>
<td>8 (6.3)</td>
<td>15 (11.8)</td>
<td>51 (40.2)</td>
<td>40 (31.5)</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>3 (7.9)</td>
<td>6 (15.8)</td>
<td>16 (42.0)</td>
<td>10 (26.3)</td>
</tr>
<tr>
<td>Community posts</td>
<td>0</td>
<td>6 (37.5)</td>
<td>2 (12.5)</td>
<td>7 (43.7)</td>
</tr>
<tr>
<td>Total</td>
<td>11 (6.0)</td>
<td>27 (14.9)</td>
<td>69 (38.1)</td>
<td>57 (31.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight-for-length</th>
<th>Z-score</th>
<th>Number (%)</th>
<th>N = 181</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>4 (3.1)</td>
<td>21 (16.5)</td>
<td>62 (49.0)</td>
</tr>
<tr>
<td>Trained health facilities</td>
<td>0</td>
<td>1 (2.6)</td>
<td>3 (7.9)</td>
<td>24 (63.2)</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>0</td>
<td>0</td>
<td>6 (37.5)</td>
<td>4 (25.0)</td>
</tr>
<tr>
<td>Community posts</td>
<td>0</td>
<td>5 (2.8)</td>
<td>30 (16.6)</td>
<td>90 (49.7)</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>5 (2.8)</td>
<td>30 (16.6)</td>
<td>90 (49.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length-for-age</th>
<th>Z-score</th>
<th>Number (%)</th>
<th>N = 181</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1 (0.8)</td>
<td>26 (20.5)</td>
<td>74 (58.3)</td>
</tr>
<tr>
<td>Trained health facilities</td>
<td>0</td>
<td>0</td>
<td>3 (7.9)</td>
<td>25 (65.8)</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>2 (12.5)</td>
<td>0</td>
<td>11 (68.7)</td>
<td>2 (12.5)</td>
</tr>
<tr>
<td>Community posts</td>
<td>2 (1.1)</td>
<td>1 (0.5)</td>
<td>40 (22.0)</td>
<td>101 (55.8)</td>
</tr>
</tbody>
</table>
A comparison of trained and untrained health facilities and community posts was undertaken to determine whether the differences in mean Z-score changes at each visit were significant, using ANOVA statistical tests. A summary of the anthropometric status of the children for each follow-up visit from baseline to the fourth visit is shown in Table 5.9. At the fourth visit the anthropometric status of the children who had completed the study, assessed using either weight-for-age or weight-for-length indices had deteriorated compared to the previous visits and these were only 26 % (n = 181) of the total sample across all the three sites. The trained health facilities showed a greater deterioration in the nutritional status of the children than the untrained health facilities at the fourth visit. Significant differences were found in the mean change in weight-for-age Z-score between trained and untrained health facilities at the second follow-up visit (p < 0.05) (see Table 5.9). There were no significant differences in mean change in weight-for-age Z-score at the third follow-up visit.

However at the fourth follow-up visit there was a significant difference in the mean change in weight-for-age Z-score between the trained health facilities and community posts (p < 0.1) and between the untrained health facilities and community post (p < 0.01). Significant differences were also found in the mean change in weight-for-length Z-score between trained health facilities and community posts (p < 0.05) and between untrained health facilities and community posts (p < 0.001). There were no significant differences for mean change in length-for-age Z-scores for fourth follow-up visit between any of the sites.
Table 5. 9 Change from baseline in mean (SD) Z-score at each visit

<table>
<thead>
<tr>
<th>Follow-up visit</th>
<th>Health facilities</th>
<th>P-values</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Weight-for-age</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td>Community post</td>
<td>Trained and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Untrained</td>
</tr>
<tr>
<td></td>
<td>-0.15 (0.34)</td>
<td>-0.27 (0.32)</td>
<td>-0.2 (0.35)</td>
<td>P &lt; 0.05*</td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; visit, n = 272</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight-for-age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td>Community post</td>
<td>Trained and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Untrained</td>
</tr>
<tr>
<td></td>
<td>-0.26 (0.5)</td>
<td>-0.31 (0.44)</td>
<td>-0.47 (0.70)</td>
<td>Ns</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>4&lt;sup&gt;th&lt;/sup&gt; visit, n = 181</td>
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<tr>
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<td>Weight-for-age</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td>Community post</td>
<td>Trained and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Untrained</td>
</tr>
<tr>
<td></td>
<td>-0.5 (0.6)</td>
<td>-0.3 (0.5)</td>
<td>-0.8 (0.7)</td>
<td>Ns</td>
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</tr>
<tr>
<td></td>
<td>Weight-for-length</td>
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<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td>Community post</td>
<td>Trained and</td>
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<td>Untrained</td>
</tr>
<tr>
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<td>-0.5 (0.6)</td>
<td>-0.3 (0.6)</td>
<td>-0.9 (0.6)</td>
<td>Ns</td>
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</tr>
<tr>
<td></td>
<td>Length-for-age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td>Community post</td>
<td>Trained and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Untrained</td>
</tr>
<tr>
<td></td>
<td>-0.13 (0.6)</td>
<td>-0.15 (0.6)</td>
<td>-0.17 (0.4)</td>
<td>Ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* ANOVA statistical test; indicates significant differences between each pair in mean Z-score changes.  
ns = not significant
The anthropometric status of children who attended all the follow-up visits and completed the study (n = 181 (26.0 %)) for the different sites was determined at each follow-up visit and compared to those who dropped out at the second and third visits. This was done to determine whether the nutritional status of the children seen at the fourth follow-up visit was worse and whether these children needed to continue with growth monitoring and promotion. The results are shown in Table 5.10.
Table 5.10 Comparison of the change in mean (SD) weight-for-age Z-score for children who completed or did not complete the follow-up visits

<table>
<thead>
<tr>
<th></th>
<th>2nd follow-up visit (n=438)</th>
<th></th>
<th>3rd follow-up visit (n=272)</th>
<th></th>
<th>4th follow-up visit (n=181)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trained</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight-for-age</td>
<td>-0.22 (SD = 0.4)</td>
<td></td>
<td>-0.11 (SD = 0.32)</td>
<td></td>
<td>-0.4 (SD = 0.5)</td>
<td></td>
</tr>
<tr>
<td>Weight-for-length</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Length-for-age</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Untrained</strong></td>
<td>(n = 38)</td>
<td></td>
<td>(n = 42)</td>
<td></td>
<td>(n = 38)</td>
<td></td>
</tr>
<tr>
<td>Weight-for-age</td>
<td>-0.22 (SD =0.3)</td>
<td></td>
<td>-0.31 (SD = 0.4)</td>
<td></td>
<td>-0.31 (SD = 0.4)</td>
<td></td>
</tr>
<tr>
<td>Weight-for-length</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Length-for-age</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Community posts</strong></td>
<td>(n = 16)</td>
<td></td>
<td>(n = 30)</td>
<td></td>
<td>(n = 16)</td>
<td></td>
</tr>
<tr>
<td>Weight-for-age</td>
<td>-0.4 (SD = 0.4)</td>
<td></td>
<td>-0.1 (SD = 0.3)</td>
<td></td>
<td>-0.7 (SD = 0.6)</td>
<td></td>
</tr>
<tr>
<td>Weight-for-length</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Length-for-age</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

ANOVA statistical test; indicates significant differences between each pair in mean Z-score changes.

**P-values**

- a = trained and c/post = P < 0.1
- d = Untrained and c/post = P < 0.05
- b = trained and c/post = P < 0.05
- e = Untrained and c/post = P < 0.001
- c = trained and untrained = P < 0.05
5.3 Mothers’/caregivers knowledge, attitudes and practices of growth monitoring and promotion

This section reports on the results of the second objective, namely: To determine knowledge, attitudes and practices of mothers/caregivers on growth monitoring and promotion, and its impact on feeding practices and weight gain of their children.

Data were collected from mothers/caregivers on child feeding practices such as exclusive breastfeeding and information on feeding practices, reasons for attending the under-five clinics, weight gain and counselling provided by primary health care workers.

5.3.1. Breastfeeding practices

5.3.1.1. Definition of exclusive breastfeeding

Exclusive breastfeeding is defined as feeding a baby exclusively on breast milk only, with no other foods or drinks being given, not even water, for a period of between 4-6 months. During this period breast milk is considered to be sufficient to meet all the nutritional needs of the baby.1,5

Of 698 children seen at the first visit (baseline), all children but 3 (n = 695; 99.6 %) were still being breastfed. Breastfeeding practices remained high and did not change over the three-month follow-up period in any of the age group categories of children. The results were high at all the sites with untrained health facilities and community posts each having 100% (n = 162 and n = 77) of their children being breastfed and trained health facilities having 99.1 % (n = 455) of their children being breastfed.

Results indicated that 171 (24.5 %) children had been exclusively breastfed for < 3 months at the first visit (Table 5.11). The proportions were the same (25.0 %) for the two age categories of 6-11 months and 12-24 months, while only 19.0 % of children from the 0-5 months age category had been exclusively breastfed for < 3 months. The 0-5 months age category had a higher proportion of children who had been exclusively breastfed for > 4 months compared to the two older age categories of 6-11 months and 12-24 months. The mean duration of exclusive breastfeeding for the whole sample was 4.3 (SD = 1.1) months, with a range of 3 to longer than 6 months. The mean duration of exclusive
breastfeeding across ages differed with 1.7 (0.4) months for the 0-5 month olds. There was a significant difference between the 0-5 month age category and the two older age groups for the duration of exclusive breastfeeding, \( p < 0.05 \), but no significance was found between the 6-11 months and 12-24 month age categories. The results indicated that a higher percentage, of children were exclusively breastfed for > 4 months from the trained health facilities (\( n = 228 \) (50.0 %)) compared to untrained health facilities (\( n = 66 \) (41.0 %)) and community posts (\( n = 32 \) (42.0 %)), respectively. There was also a significant difference in the age of introduction of complementary foods across all the age categories (\( p < 0.001 \)).

**Table 5. 11 Characteristics of mothers/caregivers feeding practices at first (baseline)**

<table>
<thead>
<tr>
<th>Visit</th>
<th>Age category in months</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently breastfeeding</td>
<td>0 – 5</td>
<td>6 – 11</td>
</tr>
<tr>
<td>Yes</td>
<td>79 (100)</td>
<td>271 (99.6)</td>
</tr>
<tr>
<td>No</td>
<td>-</td>
<td>1 (0.4)</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Length of exclusive breastfeeding</td>
<td>&lt; 3 months</td>
<td>15 (19.0)*</td>
</tr>
<tr>
<td>&gt; 4 months</td>
<td>53 (67.0)*</td>
<td>122 (45.0)</td>
</tr>
<tr>
<td>&gt; 6 months</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>11 (14.0)*</td>
<td>82 (30.0)</td>
</tr>
<tr>
<td>Introduction of complementary foods</td>
<td>Foods given</td>
<td>11 (14.0)§</td>
</tr>
<tr>
<td>No foods given</td>
<td>68 (86.0)</td>
<td>190 (70.0)</td>
</tr>
<tr>
<td>N</td>
<td>79</td>
<td>272</td>
</tr>
</tbody>
</table>

* \( X^2 \) test for significance between age categories, \( P < 0.05 \)

§ Soft maize meal porridge other than breast milk introduced within first 3 months and φ foods other than porridge were given after 4th month breastfeeding.

### 5.3.2. Child feeding practices at discharge

The same questionnaire that was administered to mothers/caregivers of children attending under-five clinics at the selected health facilities at first visit (baseline) was repeated at fourth visit (discharge) to mothers/caregivers whose children had completed the study. The purpose was to determine whether any changes had occurred in child feeding practices as a result of change in knowledge, attitudes and practices associated with growth monitoring and promotion during the 3-month follow-up study period. The results
at the fourth visit indicated that breastfeeding was still high (> 95.0 %) for all age categories.

5.3.3. **Introduction of complementary feeding**

Eleven (14.0 %) children aged 0-5 months had foods introduced in the first three months of life. Thirty percent and 27.6 % of the children in the older groups, 6-11 months and 12-24 months age categories, respectively had other foods introduced within the first 4 months. The most common complementary food that was introduced first was soft maize meal porridge. For the older age groups, other than maize meal porridge foods offered first included the staple dish nshima,\(^1\) eaten with the accompaniments (children are given mainly gravy only) such as vegetables, beans, kapenta,\(^2\) meat, chicken and fish.

5.3.4. **Dietary practices**

It was not possible to analyse foods that were given to children by mothers/caregivers, as dietary intake was not measured, which was a limitation of the study. However information was collected on the variety of foods being given by mothers/caregivers to children. The results indicated that the diet had little variety and consisted mainly of the most common staple nshima. This was either eaten with vegetables such as cabbage and rape,\(^3\) or beans, and occasionally meat, chicken, fish such as kapenta (children were mainly given gravy from the accompaniment) and this finding was similar from all the three sites. The diets of most of the children indicated that the type of foods that were given were either low in energy or protein, or both. Reported complementary foods that were commonly provided to children were also low-energy foods such as maize meal porridge, nshima, cabbage, rape and beans. The most common first food given was soft maize meal porridge, and only sometimes was there addition of high-energy or high-

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\(^1\) nshima is a stiff maize-meal porridge which is the equivalent of pap in South Africa.  
\(^2\) kapenta are very small fresh water fish eaten whole, fresh or dry.  
\(^3\) Rape is a green vegetable and only the leaves are consumed
protein foods such as oil or margarine and groundnuts, milk or eggs. This feeding practice was common to all sites, trained and untrained health facilities and community posts. Oil was also used in food preparation if it was available. Fruits were not commonly eaten; which could imply a low intake for micronutrients.

5.3.5. Aspects of growth monitoring and promotion practices

Other information that was obtained from mothers/caregivers related to reasons for bringing their children to the under-five clinic; interpretation of the growth curve and whether or not they thought it was important to know their child’s weight. Of the 698 mothers/caregivers, only 3 (0.4 %) could not indicate why they had brought their children to the under-five clinic. The remainder 695 (99.6 %) indicated they had brought them for weighing, immunizations or because the child was sick. (See Table 5.12).

Correct interpretation of the direction of the growth curve was obtained from 489 (70.0 %) of mothers/caregivers. Sixty-seven percent of mothers/caregivers from both trained health facilities and community posts, and 80.9 % from untrained health facilities, interpreted the growth curve direction correctly. There was a significant difference in the interpretation of the direction of growth curve between the trained and untrained health facilities and between untrained health facilities and community posts, (p < 0.05).

There was no significant difference between the trained health facility 306 (66.7 %) and community posts 52 (67.0 %) in the interpretation of direction of the growth curve.
Table 5.12 Responses of mothers/caregivers attending under-five clinics regarding
Knowledge, attitudes and practices on growth monitoring and promotion at first visit (baseline) N = 698

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Health facility</th>
<th>Community posts</th>
<th>Total N = 698</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trained n = 459</td>
<td>Untrained n = 162</td>
<td></td>
</tr>
<tr>
<td>Reason for attending under-five clinic:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighing (growth monitoring)</td>
<td>365 (79.5)</td>
<td>128 (79.0)</td>
<td>565 (81.0)</td>
</tr>
<tr>
<td>Immunization/weighing</td>
<td>84 (18.3)</td>
<td>31 (19.1)</td>
<td>119 (17.0)</td>
</tr>
<tr>
<td>Child is sick</td>
<td>8 (1.7)</td>
<td>2 (1.2)</td>
<td>11 (1.6)</td>
</tr>
<tr>
<td>Does not know</td>
<td>2 (0.4)</td>
<td>1 (0.6)</td>
<td>3 (0.4)</td>
</tr>
<tr>
<td>Interpretation of direction of the growth curve:*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpreted correctly</td>
<td>306 (66.7)</td>
<td>131 (80.9)</td>
<td>489 (70.0)</td>
</tr>
<tr>
<td>Not interpreted correctly</td>
<td>113 (24.6)</td>
<td>14 (8.6)</td>
<td>60 (8.7)</td>
</tr>
<tr>
<td>Unable to interpret at all</td>
<td>40 (8.7)</td>
<td>17 (10.5)</td>
<td>149 (21.3)</td>
</tr>
<tr>
<td>Importance of knowing child’s weight:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know child’s growth</td>
<td>226 (49.2)</td>
<td>74 (45.7)</td>
<td>322 (46.0)</td>
</tr>
<tr>
<td>Know child health status</td>
<td>91 (19.8)</td>
<td>37 (22.8)</td>
<td>147 (21.0)</td>
</tr>
<tr>
<td>Know if child gaining or losing</td>
<td>70 (15.3)</td>
<td>34 (21.0)</td>
<td>124 (18.0)</td>
</tr>
<tr>
<td>Know how to care of child</td>
<td>27 (5.9)</td>
<td>14 (8.6)</td>
<td>47 (6.7)</td>
</tr>
<tr>
<td>Weight tells you when there is a problem</td>
<td>26 (5.6)</td>
<td>0 (0.0)</td>
<td>32 (4.5)</td>
</tr>
<tr>
<td>Does not know</td>
<td>19 (4.1)</td>
<td>3 (1.8)</td>
<td>26 (3.7)</td>
</tr>
<tr>
<td>Recommended weighing schedule:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td>458 (99.8)</td>
<td>162 (100)</td>
<td>697 (99.9)</td>
</tr>
<tr>
<td>Twice per month</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>More than twice per month</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Does not know</td>
<td>1 (0.2)</td>
<td>0 (0.0)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>Information provided by health worker on how to improve growth curve:**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information given</td>
<td>28 (6.1)</td>
<td>21 (13.0)</td>
<td>63 (9.0)</td>
</tr>
<tr>
<td>No information given</td>
<td>431 (93.9)</td>
<td>141 (87.0)</td>
<td>635 (91.0)</td>
</tr>
<tr>
<td>Suggestion provided by health worker on how to improve child’s weight:*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggestion made at visit</td>
<td>19 (4.1)</td>
<td>14 (8.6)</td>
<td>41 (6.0)</td>
</tr>
<tr>
<td>No suggestion made</td>
<td>440 (95.9)</td>
<td>148 (91.4)</td>
<td>657 (94.0)</td>
</tr>
</tbody>
</table>
Maternal perceived ability/ intention to practice a suggestion for improving weight:*  

<table>
<thead>
<tr>
<th></th>
<th>Yes practice</th>
<th>No advice given</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19 (4.1)</td>
<td>440 (95.9)</td>
</tr>
<tr>
<td></td>
<td>14 (8.6)</td>
<td>148 (91.4)</td>
</tr>
<tr>
<td></td>
<td>8 (10.4)</td>
<td>69 (89.6)</td>
</tr>
<tr>
<td></td>
<td>41 (6.0)</td>
<td>657 (94.0)</td>
</tr>
</tbody>
</table>

**Nutrition counselling:**  

<table>
<thead>
<tr>
<th></th>
<th>Message given to improve weight</th>
<th>No message given</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 (2.6)</td>
<td>447 (97.4)</td>
</tr>
<tr>
<td></td>
<td>6 (3.7)</td>
<td>156 (96.3)</td>
</tr>
<tr>
<td></td>
<td>5 (6.5)</td>
<td>72 (93.5)</td>
</tr>
<tr>
<td></td>
<td>23 (3.3)</td>
<td>675 (96.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>459</td>
<td>162</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td>698 (100)</td>
</tr>
</tbody>
</table>

** P < 0.001, * P < 0.05, X² test for significant differences between facilities.

Mothers/caregivers indicated that it was important to know the child’s weight, as it was an indication of “something happening in the child’s body”. A commonly given response (n = 322; 46.0 %) was that weight was an indicator of the child’s growth. Of the mothers/caregivers, 22 (28.0 %) from community posts, 226 (49.2 %) from trained health facilities, and 74 (45.7 %) from untrained health facilities gave this response. Twenty-six (3.7 %) mothers/caregivers could not describe why the child’s weight was important.

Other than one mother (0.1 %) from a trained health facility, the remainder (n = 697; 99.9 %) could correctly identify the recommended monthly weighing schedule as being once per month.

At the first visit 63 (9.0 %) mothers/caregivers indicated that they had received some information relating to their child’s growth curve from a health worker. More mothers/caregivers from untrained health facilities, (n = 21 (13.0 %)) and community posts, (n = 14 (18.0 %)) than from trained health facilities (n = 28 (6.1 %)) had received nutrition-related information on improving the child’s weight from health workers (p < 0.001).

Forty-one (6.0 %) mothers/caregivers indicated that they had received suggestions from the health worker on how to improve their child’s weight. Of these, 19 (4.1 %) were from trained health facilities, 14 (8.6 %) were from untrained health facilities and 8 (10.4 %) were from community posts. All 41 mothers/caregivers who had received such advice
indicated that they were going to put into practice what they had been told by the health workers. There was a significant difference (p < 0.05) between the sites in the percentage of subjects that had received suggestions from health workers.

Twenty-three (3.3 %) mothers/caregivers indicated that they had been given specific nutrition-counselling information on feeding practices to improve the health of their children. More of these mothers/caregivers were from community posts (6.5 %), than either trained (2.6 %) or untrained (3.7 %) health facilities, but the differences were not significant.

5.4 Knowledge, attitudes and practices of health facility managers, health workers and community health workers regarding GMP

The third section of the results reports on data pertaining to the third objective, namely: To determine and compare the knowledge, attitudes and practices of trained and untrained primary health care providers on growth monitoring and promotion.

5.4.1. Introduction

A total of 6 health facility managers (one from each of the 6 health facilities included in the study), 26 MCH health workers and 19 community health workers (CHWs) were interviewed using structured questionnaires. Of the 19 CHWs, 9 were from the community posts, while the remaining 10 operated from health facilities (clinics) as there were no well-established and functional community posts in their areas.

Health facility managers were asked whether they had received training in either GMP or IMCI, or both, and what proportion of their health workers had been trained in GMP or IMCI, or both. Further information was also collected on their perceived role regarding the usefulness and successes of GMP, identified problems regarding implementation, and recommendations relating to ways in which the GMP programme could be improved.

5.4.2. Health facility managers’ responses regarding aspects of GMP

None of the six health facility managers from both trained and untrained health facilities that participated in the interviews had previously been trained in growth monitoring and
promotion at the time when the study was conducted. Three facility managers from trained health facilities and two from the untrained health facilities were trained in Integrated Management of Childhood Illnesses (IMCI) while one facility manager from an untrained health facility had not been trained in either GMP or IMCI. The six health facility managers reported between them a total of eight health workers out of 26 MCH health workers who had been trained in GMP, IMCI or both.

All three health managers from trained health facilities indicated the **role of GMP** as identifying children in danger of developing undernutrition. One manager from a trained health facility and two from untrained health facilities reported that training more health workers in growth monitoring and promotion, and securing more GMP supplies, were important aspects of their work.

All six health facility managers from both trained and untrained health facilities mentioned that they perceived the GMP programme to be **useful** in various situations. Two health facility managers from trained and one from untrained health facilities indicated that they found GMP useful to identify underweight children. One manager each from trained and untrained health facilities mentioned perceived benefits of GMP as the decongestion of the health facility, and that individual counselling was made possible, as well as that it was an opportunity for improving immunization coverage.

All six health facility managers mentioned the following **problems** in providing a fully functioning GMP programme: a shortage of trained health workers in GMP; the need for community GMP shelters; the need for more GMP supplies; as well as a high drop-out rate of GMP community volunteers.

All six health facility managers from trained and untrained health facilities indicated **recommendations** for the GMP programme to run more successfully as being a need to train more health workers and community staff. The need for community GMP shelters to be built was suggested by two managers each at trained and untrained health facilities, as well as the need for adequate supplies such as scales.
5.4.3. Knowledge, attitudes and practices of health staff and community health workers regarding GMP

Twenty-six MCH health workers were interviewed, 18 from trained and 8 from untrained health facilities. Of the 18 MCH health workers from trained health facilities, 10 were excluded at analysis stage after it was established that they had not received training in GMP, IMCI or both GMP/IMCI. The reason for excluding the 10 health workers was because the impact of training on knowledge, attitudes and practices on growth monitoring and promotion of health staff was being assessed. This left only 8 MCH health workers each from trained and untrained health facilities and 19 CHWs, who were interviewed on their knowledge, and practices on growth monitoring and promotion. (See Table 5.13).

Of the eight health workers from trained health facilities that were interviewed all indicated that they had previously received training. Of these four (50.0 %) indicated they had been previously trained in GMP, two (25.0 %) were trained in IMCI while one (12.5 %) also trained in IMCI was from untrained health facilities. Two (25.0 %) health workers from trained health facilities had received training in both GMP and IMCI.

Regarding definition of growth monitoring, 7 (87.5 %) and 6 (75.0 %) health workers from trained and untrained health facilities, respectively, and 13 (68.4 %) CHWs from community posts defined it correctly. Untrained health facilities had a higher proportion, of health workers than the trained health facilities (25.0 % compared to 12.5 %, respectively) that could not define growth monitoring correctly. The results were similar for the correct definition of growth promotion, given by 7 (87.0 %) health workers from trained and 6 (75.0 %) from untrained health facilities, compared to 12 (63.0 %) CHWs. There was a significant difference (p < 0.001) in correctly defining growth monitoring and growth promotion from health workers from trained health facilities and community posts.
Table 5. 13 Knowledge, attitudes and practices of health workers and community
Health workers regarding growth monitoring and promotion practices

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Health facilities</th>
<th>Community posts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trained n = 8</td>
<td>Untrained n = 8</td>
<td>N = 19</td>
</tr>
<tr>
<td>Previous training received by health workers and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>community health workers:*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training in GMP</td>
<td>4 (50.0)</td>
<td>0</td>
<td>19 (100)</td>
</tr>
<tr>
<td>Training in IMCI</td>
<td>2 (25.0)</td>
<td>1 (12.5)</td>
<td>0</td>
</tr>
<tr>
<td>Training in both GMP/IMCI</td>
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<td>0</td>
</tr>
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<td>7 (87.5)</td>
<td>0</td>
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<td></td>
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</tr>
<tr>
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<td>6 (75.0)</td>
<td>13 (68.4)</td>
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<td></td>
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</tr>
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<td>Improves immunization coverage</td>
<td>1 (12.5)</td>
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<tr>
<td>Opportunity for providing feeding advice</td>
<td>2 (25.0)</td>
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<td>9 (47.0)</td>
</tr>
<tr>
<td>Opportunity to assess child’s health status</td>
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<td>8 (100)</td>
<td>3 (16.0)</td>
</tr>
<tr>
<td>Opportunity for health education</td>
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<td>0</td>
<td>7 (37.0)</td>
</tr>
<tr>
<td>Determining child’s weight:</td>
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<td></td>
</tr>
<tr>
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<td>7 (87.5)</td>
<td>4 (50.0)</td>
<td>12 (63.0)</td>
</tr>
<tr>
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<td>1 (12.5)</td>
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<td>7 (37.0)</td>
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<td>Completing the under-five card:*</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>8 (100.0)</td>
<td>4 (50.0)</td>
<td>9 (47.4)</td>
</tr>
<tr>
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<td>Plotting of weights:</td>
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<td></td>
</tr>
<tr>
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<td>7 (87.5)</td>
<td>18 (94.7)</td>
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<td></td>
<td></td>
</tr>
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<td>6 (75.0)</td>
<td>3 (37.0)</td>
<td>16 (84.0)</td>
</tr>
<tr>
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<td>3 (16.0)</td>
</tr>
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<td>Health facilities</td>
<td>Community posts</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trained</td>
<td>Untrained</td>
<td></td>
</tr>
<tr>
<td>Frequency of liaison with HW/CHWs:</td>
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<td></td>
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<tr>
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<td>3 (37.5)</td>
<td>2 (25.0)</td>
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</tr>
<tr>
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<td>2 (25.0)</td>
<td>6 (75.0)</td>
<td>12 (63.1)</td>
</tr>
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<td>Once a month</td>
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<td></td>
<td></td>
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<tr>
<td>GMP</td>
<td>1 (12.5)</td>
<td>1 (12.5)</td>
<td>12 (63.0)</td>
</tr>
<tr>
<td>Immunization</td>
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<td>0</td>
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<td>Hygiene and sanitation</td>
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<td>2 (25.0)</td>
<td>3 (16.0)</td>
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<tr>
<td>All the above</td>
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<td>Weighing schedule for - 0-2 years of age:</td>
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<td>8 (100.0)</td>
<td>15 (79.0)</td>
</tr>
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<td>4 (21.0)</td>
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<td></td>
</tr>
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<td>Large catchment area</td>
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<td>0</td>
</tr>
<tr>
<td>Shortage of supplies</td>
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<td>1 (25.0)</td>
<td>8 (42.1)</td>
</tr>
<tr>
<td>Shortage of trained health workers</td>
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<td>0</td>
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<td>Need GMP shelter</td>
<td>3 (37.5)</td>
<td>1 (12.5)</td>
<td>9 (47.4)</td>
</tr>
<tr>
<td>Mother/caregivers not coming for under-five services</td>
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<td>0</td>
</tr>
<tr>
<td>No problems</td>
<td>0</td>
<td>4 (50.0)</td>
<td>2 (10.5)</td>
</tr>
<tr>
<td>Recommendations:</td>
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<td></td>
<td></td>
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<tr>
<td>Build another clinic in area</td>
<td>2 (25.0)</td>
<td>1 (12.5)</td>
<td>0</td>
</tr>
<tr>
<td>More supplies and GMP shelters</td>
<td>3 (37.5)</td>
<td>2 (25.0)</td>
<td>10 (52.6)</td>
</tr>
<tr>
<td>Continue with GMP programme</td>
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<td>0</td>
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<td>Train more staff in GMP</td>
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<tr>
<td>Providing soya to u/weights</td>
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<td>0</td>
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</table>

**P < 0.001 and P < 0.05 X^2 test for significance of differences between sites.**

All health care providers from trained and untrained health facilities and community posts indicated that they perceived GMP to be useful. One health worker (12.5 %) from a trained health facility indicated that GMP provided an opportunity for improving immunization coverage. Nine CHWs (47.0 %) from community posts and two health workers (25.0 %) from trained health facilities indicated that GMP provided an
opportunity for giving feeding advice although they didn’t actually practice giving advice. All the eight health workers (100.0 %) from untrained health facilities, five health workers (62.5 %) from trained health facilities and three CHWs (16.0 %) saw GMP as an opportunity to assess the child’s health status. Only seven CHWs (37.0 %) found it to be an opportunity for health education.

Health staff and CHWs were given the age and specific weights for a sample child to complete and plot the weights on an under-five card and thereafter asked to interpret the child’s growth curve. The majority of health workers, 8 and 4 from trained and untrained health facilities (100.0 % and 50.0 %, respectively) and 9 (47.4 %) from CHWs completed the card correctly. The results were similar for CHWs where all except one (18 (95.0 %)) plotted the weights correctly. Results were better for CHWs (n = 16 (84.0 %)) regarding the interpretation of the growth curve than for health workers from either trained 6 (75.0 %) or untrained 3 (37.0 %) health facilities, respectively (p < 0.05). All health workers from trained and untrained health facilities named the weighing schedule correctly while four (21.0 %) CHWs from the community posts were unable to identify the correct recommended weighing schedule.

Health workers from both trained and untrained facilities identified problems in the implementation of the growth monitoring and promotion programme. Two (25.0 %) from the trained health facilities identified too large a catchment area while another two (25.0 %) identified a shortage of trained health workers. Three (37.5 %) and one (12.5 %) health worker from trained and untrained health facilities, respectively, and nine (47.4 %) CHWs identified a need for GMP shelters. Eight (42.1 %) CHWs and one health worker each from trained and untrained health facilities, respectively, identified shortage of supplies as a problem. To address the problems, recommendations were made by health workers and CHWs for more supplies and GMP shelters by 3 (37.5 %) and 2 (25.0 %) subjects from trained and untrained health facilities, respectively, and by 10 (52.6 %) of the CHWs. Two (25.0 %) health workers from trained health facilities and five (50.0 %) from untrained health facilities indicated a need for more staff to be trained in GMP, while three (15.8 %) CHWs identified the same need.
5.5. Qualitative component results

This section reports on the findings of qualitative data collected through focus group discussions to substantiate some of the issues raised from the quantitative data on knowledge, attitudes and practices of mothers/caregivers from trained and untrained health facilities and community posts.

From the analysed data, five main categories emerged that illustrated mothers/caregivers knowledge, attitudes and practices on growth monitoring and promotion. These were (1) importance of under-five clinic; (2) useful information received from health providers; (3) health workers’ attitudes towards improving children’s weight; (4) feasibility/accessibility of under-five clinic; (5) feasibility to implement advice to improve children’s weight. There were three sub-categories that emerged and these were (i) growth of children; (ii) putting health worker’s information in practice and (iii) perceived barriers in implementing GMP practices.

The results are supported by verbatim responses to illustrate the discussion deliberations, where appropriate, and these are presented under the headings and sub-headings of the themes. The verbatim responses are quoted from the transcriptions and abbreviated as follows: T for trained health facilities, UT for untrained health facilities and CP for community posts.

5.5.1 Importance of under-five clinic

The focus group discussion established that mothers/caregivers linked the importance of under-five clinic to the child’s weight. By attending the under-five clinic, mothers/caregivers confirmed the growth, well-being and health status of the child through weight measurements. The mothers/caregivers also linked the importance of the under-five card (growth chart) to the under-five clinic as a way of confirming the child’s weight. They mentioned that nurses weighed the children, explained the weight to the mother/caregiver and plotted it on the under-five card. In addition, to improving the health status of their children, mothers/caregivers mentioned that at the under-five clinic their children were immunized, which protected them from diseases. The under-five
clinic was also perceived as important by mothers/caregivers as it was here that they were taught how to care for their children.

"Because how else can you know if your child is growing or not if you don't attend under-five......" (T)

"You know the scale\textsuperscript{4} of the child when you come for under-five clinic, if it is going up or down. At under-five clinic they also teach us how to feed our children and how to be clean so that our children don't suffer from diarrhoea." (T)

"Under-five clinic is important because the children are given injections which protect them from diseases. If you don't have a card the nurses will ask if you have never been given one or you lost it. They may give you another card if you don't have one so that the child can be given injections." (UT)

"It is good to know how the scale is going because it means as a mother you are caring for the child well. So you can try to make sure it does not go down, as it is not a good sign." (CP)

The following one sub-category resulted from the main category "importance of under-five clinic."

5.5.1.1. Growth of children

Mothers/caregivers used weight as an indicator of the child's growth, wellbeing or of "something happening in the child's body." This indicator let the mothers/caregivers know if the child was healthy and looking well or if the child was losing weight and looking sick. Weight was a confirmation of the "health status" (good or bad health status) of the child, as well as a confirmation of the mother doing the "right thing". If the weight was going up they interpreted that the child was healthy or growing well. If it is going down they interpreted that "something" was not right with the child. Mothers/caregivers also related the importance of food as a major component in ensuring

\textsuperscript{4} Scale is a commonly used word meaning weight.
that the child’s weight did not go down. They indicated that they tried within their means to ensure the weight of the child did not go down although they sometimes failed due to reasons such as not feeding the child properly due to unavailability of adequate food in the household.

“..... I will know that things are okay in the body of my child if the weight is going up when I bring him for under-five clinic.” (UT)

“Monitoring the growth is important because it makes you know if the child is healthy or not when the weight is going up or down. The scale of the child tells us things about the child (with slight laughter). You know what sister these days; there are a lot of diseases so one has to be concerned with the child’s weight. I am agreeing with what this other mother has just said, if it is going up you feel good as a mother because you know you are also okay and you can only know the scale if you bring the child for under-five clinic.” (T)

“There are diseases like AIDS these days. You can’t know if the child has the disease sometimes until you see your child’s weight is not going up, the child is not looking okay and the child always looks sick. So when you come for under-five and the nurse tells you the scale for the child you feel good if it is going up.” (T)

5.5.2. Useful information received from health providers

Much as mothers/caregivers appreciated the information given by health workers, they considered receiving information from health workers as meaning they were dependent on them. However they did not look forward to being given information, as it was not done in privacy but in front of other mothers/caregivers, and left them feeling embarrassed. The information given through health education was not always specific and relevant to their child’s situation, due to the fact that the advice was not targeted and was given in a group setting. Some mothers/caregivers also considered their attendance at health education lessons as being a waste of time. They resorted to not attending health education lessons, as attending meant coming early and staying longer at the clinic. However mothers/caregivers indicated that most times health workers did not give any information to them.
"Nurses tell us to feed our children porridge with eggs, milk, soya and to give other foods like fruits such as bananas, oranges. (CP)"

"Only sometimes, they tell us not to give our children only maize meal porridge but to add groundnuts, oil or eggs. But you know sister we very much want our children not to lose weight, but these foods they tell us to give our children we can’t afford them. You know life is very difficult these days." (T)"

"Sometimes yes they can say something but not always, you know sister once you miss the lesson at the beginning before they start weighing and giving injections then that is it they won't tell you anything, even just telling you whether your child’s scale is going up or down other than what the scale is." (T)"

"They wait for mothers to be many and then they can teach us on diarrhoea, malaria, or cleanliness and other things like feeding the children. But if you come late you miss." (UT)"

"As for me I have never been told anything by the nurses. The nurses you see have no time to talk with us since they say they are very busy. They just tell you the weight of the child and that is it unless the child is also receiving an injection then they will tell you that you wait for the injection." (T)"

"Since I started coming to Bauleni clinic, they have never told me anything on what to give my child to help the weight go up. But where I was staying before in Chelstone, my child had diarrhoea they gave me madzi-a-moyo ⁵ and told me how to use it and the nurse also told me how to feed my child." (UT)"

There were two sub-categories that resulted from the main category “Useful information received from health providers” as follows:-

5.5.2.1. Putting health worker’s information in practice

Mother/caregivers mentioned that they would put into practice information from health workers if it were given, as they found it to be helpful. They also found information useful and appropriate at times when they were not sure of how to deal with situations.

⁵ Madzi-a-moyo is Oral Rehydration Solution
The mothers/caregivers mentioned that they found the information given to be empowering and to give them confidence in caring for their child, and that it confirmed their child’s health status or wellness.

"The information is helpful but if only the nurses could tell us properly. You know children are difficult to feed and sometimes they eat, sometimes they refuse. In most times we give our children whatever we have but they will cry for something else. Like now my child today was crying for eggs and only wants eggs. I can buy one or two eggs but after that if the child continues crying where do I get the money to buy more eggs?" (T)

"It is very helpful but I sometimes have no food at home so I cannot do what they teach me, it makes me feel bad as a mother.....(CP)

"Although they have not told me anything, information on how to look after our children properly would be helpful, as it would help so that the weight doesn’t go down. It is only that these foods are expensive we can’t afford them. I can cook porridge may be only once and the child will the rest of the time eat whatever the family eats." (T)

"You know sister some mothers say their children will get sick when they bring them to the under-five clinic when they are given injections. Other mothers say there is no difference between children who are brought to the clinic for under-five clinic and those who don’t. Just like the other mother has said even my neighbour was told by her mother-in-law to stop taking her child for under-five clinic because the child would get sick after the injections. I told her that it was not true because my child has never been sick and she should just bring her child to the clinic." (CP)

5.5.2.2. Perceived barriers in implementing GMP practices

The major constraint mothers/caregivers mentioned in implementing practices that contributed towards their children’s well-being was not having sufficient money to purchase the food items which are recommended by health workers. Mothers/caregivers were willing to put into practice any information given as long as it contributed to improving their children’s well-being, be it finding time to the attend under-five clinic, or giving their children the best foods.

82
"Money is needed to buy anything and do anything. For me sister the problem is that my uncle where I stay is unemployed at the moment and we are many at home. It is difficult to find money and it is never enough." (CP)

"Sometimes the child has no appetite even if food is there. Even when you try to feed as much the child won’t just eat." (T)

"Money is not enough and is difficult to find. It is worse for me because my husband sometimes does not get paid on time and it is also not a lot of money they always get their salaries late. We struggle a lot to feed out family." (T)

Mothers/caregivers also mentioned that sometimes finding sufficient time to care for their children was a barrier, which prevented them from practicing what they are advised by health care workers.

"Sometimes it is difficult to find time to care for the child because I am a marketer. I have to go and make orders such that I find it difficult to always find time and I don’t have anyone to help me look after the child." (UT)

Mothers/caregivers also mentioned that they sometimes spend a long time at the clinic as nurses wait until there were many mothers before they started seeing the mothers. Therefore some mothers deliberately came late to serve on time so that they found the nurses had already started seeing the children.

"We spend a long time at the clinic because the nurses want us to wait until we are many before they start weighing and giving injections to the children." (CP)

"The nurses wait until the mothers are many before the lesson or seeing the children can begin. They will get the child’s card and put it on top so that those who come late their children’s cards will be at the bottom and you can’t leave without the card. When they begin to weigh, they call out the cards one by one from the top to bottom." (UT)

Not having clean clothes has also prevented some mothers/caregivers from attending under-five clinic hence missing out on what they could have benefited from had they attended.
"It is easy and there are no problems in bringing the children for under-five clinic except that sometimes you can miss because the clothes are dirty. Soap is a problem to get, as you need money to buy it. You know it is embarrassing to come to the clinic looking dirty. Mothers/caregivers at the clinic talk a lot and even the nurses do talk in a bad way too." (T)

5.5.3. Health worker’s negative attitude

Another category that emerged was related to the mothers'/caregivers' experiences of a discouraging attitude towards them, on the part of the health workers. It was reported that health workers did not address mothers/caregivers and that the nurses sometimes did not talk in a respectful way when giving the information. Another identified problem is that health care workers speak to mothers in front of other mothers when they provide advice, rather than in privacy.

"The information is helpful if only they could tell us properly........" (T)

"........ you know sometimes you really feel you want to do something when they tell you to do it or maybe even want to ask them something, but we can’t ask, as we are scared. You know there are usually many mothers and you are in a queue, the nurses don’t talk to us or answer us well and it is very embarrassing and discouraging." (UT)

"They don’t answer properly. When the child loses weight, why do they ask questions like “Why don’t you feed your child properly?” They do this without even asking if we can afford the foods. “You just want us to give you soya so that you go and eat with your other family members.” They say all these things when the child is still even in the scale bag. I have never fed my family on soya, it is only that my child is sick that is why the child has lost weight. They tell us off in front of other mothers/caregivers, these nurses should be told that they need to talk to us properly." (UT)

"You know sometimes in order not to be embarrassed even if you don’t have the foods that they are telling you or can’t afford them to give to your child, you just agree to what the nurses are telling you. If you answer them back that you can’t afford them they will just embarrass you in front of other mothers. Because if you don’t have the means to do it, how do you do it? You don’t have sister and that is it. (T)
"... Mothers/caregivers at the clinic talk a lot and even the nurses do talk in a bad way too....." (CP)

5.5.4. Feasibility/accessibility of under-five clinic

Another category that emerged related to the mothers'/caregivers' ability to bring their children for growth monitoring and promotion sessions during under-five clinic. Mothers/caregivers did not think there were any major problems in bringing children for under-five clinic.

"It is easy and time is not a problem. It is easy because children are only brought for under-five clinic once a month unless if the child is sick, it is easy as it is not on daily basis. Even if you have a commitment the day of the appointment, you can take the child to the clinic another day." (T)

"...... it is just that we are many and spend a long time at the clinic because the nurses want us to wait until we are many before they start seeing the children, but it is easy to bring children to the clinic." (T)

"Sister there is no problem with bringing the children to under-five clinic. You simply leave whatever you are doing as the child's health is important. Mothers/caregivers who don't bring their children are just lazy, and are not interested in their children health; we see them in the compound. They just sit around and chat with friends." (UT)

5.5.5 Feasibility to implement advice to improve children’s weight

Availability of food formed the focus of this category; otherwise mothers/caregivers reported that they would have loved to feed their children frequently. Suggestions on how to improve the weight of their children were given, such as income-generating activities to raise money to buy foods for their children. Mothers/caregivers expressed a desire to have food gardens at home but the uncertainty of their living conditions did not allow them to develop food gardens as they may be required to move at anytime. They also realised there were other things they could do besides just providing adequate food to
improve on their children’s well-being, such as keeping the child’s environment clean so that the child did not get sick from diarrhoea.

“Maybe to have a small garden at the clinic where we can grow vegetables so that we sell to raise money to buy Soya for feeding our children. Most of us don’t have gardens at home because the plots are very small.” (UT)

“Even if I could grow vegetables at home it would be difficult because it is not our house. Landlords change their mind just like that without warning. They hike the rent anytime without warning, and once they do that you have to pay or you are out and have to shift to a place you can afford. We can shift any time when the rent is hiked if we don’t have money to pay. Also some landlords don’t allow us to have gardens.” (CP)

“Then in that case even just keeping the environment clean so that my child does not get sick especially from diarrhoea.” (T)

“It is difficult but maybe just to continue feeding the child whatever food we have is better than not giving the child anything.” (T)
CHAPTER 6: DISCUSSION

The use, in primary health care programmes, of growth monitoring and promotion to detect early growth faltering still raises questions about its effectiveness\textsuperscript{23,25,26}

In this section, the Lusaka district growth monitoring and promotion programme is discussed with regard to the interpretation of the study findings followed by consideration of the study limitations, addressing potential sources of confounding and bias.

6.1. GMP Outcomes among children below 2 years at trained and untrained health facilities and community posts

6.1.1. Differences in the socio-demographic data between the three sites.

Mother’s/caregiver’s social economic abilities, income, education and health practices can be influential causes of child undernutrition. Results indicated that untrained health facilities were better than trained health facilities and community posts in most of the socio-demographic indicators. Trained health facilities had a higher percentage of mothers/caregivers aged 10-19 years (19.6 %) while untrained health facilities had a higher percentage of mothers/caregivers aged 20-29 years. Majority of mothers/caregivers from trained health facilities as well as community posts were married (88.7 % and 88.0 %, respectively) than those from untrained health facilities (80.8 %). Trained health facilities had a higher percentage (61.4 %) of mothers/caregivers who had attained primary schooling compared to untrained health facilities that had a higher percentage of mothers/caregivers (45.0 %) who had attained secondary schooling as well as post school qualification (11.7 %). Other than being related to knowledge of good child care practices, maternal education also influences the ability to make quality nutrition decisions.\textsuperscript{61} Fewer mothers/caregivers from untrained health facilities compared to the other two sites were dependent on their spouses for income (61.7 %) while majority of mothers/caregivers were in formal employment (9.8 %) than from trained health facilities (3.0 %) and community posts (4.0 %) respectively. There were more mothers/caregivers from trained health facilities who were living in 1-roomed houses
(22.0 %) compared to 28.0 % who were living in more than 3-roomed houses from untrained health facilities. Majority of mothers/caregivers from trained health facilities (60.5 %) were living in houses electricity while trained health facilities were higher in percentage (66.3 %) of houses without electricity. Although there were similar proportions of mothers/caregivers from all sites receiving tap/piped water, trained health facilities were the only ones with some mothers/caregivers who were drawing water from wells (1.0 %), a factor which represents an immediate threat to health, particularly of children through increased risks of food contamination and diarrhoeal disease. Quality of toilet facility is an important hygienic factor. Untrained health facilities had higher percentage of those who were using a flush toilet in the house while trained health facilities and community posts were higher in those who were using communal pit latrines (57.9 % and 56.0 %, respectively) compared to 32.7 % from untrained health facilities.

6.1. 2. Anthropometric status of the children

The findings indicated that underweight, wasting and stunting were similarly prevalent at the trained, untrained health facilities and community posts, indicating both acute and long term under nutrition. Most of the children who were recruited in the study had growth faltering. However, there were high levels of severely stunted children from trained and untrained health facilities (13.5 % in both) and community posts (14.3 %); these findings are consistent with published data.\textsuperscript{35,61,62,63,64} Stunting appeared to start early as children in the age group 0-5 months were already affected, although those between 12-24 months were the most affected age group. This early onset of undernutrition has previously been documented by Shrimpton \textit{et al.}\textsuperscript{65} who investigated patterns and timing of growth faltering in both developed and developing countries. The study found that by 3 months, weight-for-age and length-for-age deviated from percentile curves and that, thereafter, these indices declined more rapidly until about 12 months of age. The authors identified early interventions to prevent growth failure at the prenatal phase and in early infancy, which could have policy implications for the prevention of childhood growth problems worldwide.

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In the agricultural seasons immediately prior to commencement of this study (i.e. 2000/2001 and 2001/2002), Zambia experienced floods and drought respectively and the cumulative effect of these two poor agricultural seasons caused a severe food shortage in a number of districts of the country. Large amounts of food losses were experienced, which threatened the country’s food security. These climatic factors would have had an impact on the nutritional status of the population’s children, who are vulnerable to food shortages. This could have been compounded by the already existing poor environmental and sanitary conditions in some of the areas included in the study. In addition, urban families rely more on food purchases than rural families to meet their household food needs. The worsening current economic situation in Zambia today, due to rapidly increasing inflation rates, low wages and lack of disposable income has probably contributed to increasing levels of poverty and undernutrition in the country.

Another factor that could have contributed to the high levels of undernutrition is HIV/AIDS. It is estimated currently in Zambia that 16 % of the adult population is HIV positive.

Available data on HIV/AIDS suggest that about 55.0 % of all new infections in Africa occur among women. Low birth weight is common in newborns of HIV-infected mothers. Evidence emerging from literature collected and reviewed by Piwoz and Preble (2000) from several African countries indicated that low-weight-for-age and stunting were higher among HIV infected children compared with the general population. Undernutrition may be a contributor to, or a consequence of HIV-related disease. Further, both undernutrition and HIV/AIDS have an impact on the food security situation of not only the country but also of households, which ultimately can affect the nutritional status of children. This is because family members particularly women who are the main food producers are drawn away from food production and other income generating activities to care for those affected by HIV/AIDS. Attention given to the care of children is also withdrawn as focus is turned to looking after those affected by HIV/AIDS. In this study children who were known to be HIV positive or had clinical features that were
suggestive of HIV/AIDS were excluded. However, it was not possible to screen all children included in the study for HIV by the ELISA technique.

6.1.3. Outcomes of GMP training at different sites

The study findings indicated that the anthropometric status of the children from all three sites had deteriorated over the 4-month period. The children did not gain adequate weight and continued to falter in growth. From the results it further appears that children at the trained health facilities and community posts did better at the second visit while children at the trained health facilities did better also at the third visit, although this was not the case for children at the community posts but this only included 30% of the original sample at this site. Children at the untrained health facility appeared to have done better at the fourth visit; however this appears to be due to the fact that the children who completed all four visits at this site were a select group of children who had a better nutritional outcome compared to the defaulters in this group. This was however, not the case for children from trained health facilities and community posts, where those who came for all the visits appeared to do worse than those who defaulted. The deterioration in anthropometric status of the children at all the sites should be interpreted with caution, as in this study it was difficult to establish whether real differences existed between the sites because the numbers were significantly reduced at the final visit due to high dropout rates. Further, mothers/caregivers of children attending the trained health facilities and community posts seemed to be more economically disadvantaged compared to the untrained health facilities and this may have influenced the nutritional status and outcome of their children. Mothers at the untrained health facilities compared to those at the trained health facilities and community posts had significantly better educational status, income, housing, electricity and sanitation. Also, the birth weights of the children at the community posts were significantly lower compared to the other sites, which may have limited the growth of the children at this site. These were potential confounding factors, which could have limited a more positive nutritional outcome of children at the trained health facilities and community posts but because of time constraints the data could not be analysed further.
In terms of a positive nutritional outcome for children, the results of the Lusaka GMP programme contrasts with the notable successes of other programmes. The most common successful examples are the Family Nutrition Improvement Programme in Indonesia (UPGK), the Tamil Nadu Integrated Nutrition programme in India (TINP), Iringa Nutrition Project in Tanzania (INP) and the Thailand Nutrition and Primary Health Care Programme. However, the reasons for the success of these programmes are not clearly evident since each programme had displayed its own unique combination of synergistic factors that make them different from the traditional GMP approach. Common to these four programmes were the following characteristics: a strong component of community involvement; rigorous training; support, monitoring, and supervision of personnel; a good referral system and adequate provision of resources and logistics.

6.2. Mother’s/caregiver’s knowledge, attitudes and practices of growth monitoring and promotion

Mothers/caregivers appeared knowledgeable on issues relating to growth monitoring and promotion. When presented with a completed growth curve, many mothers/caregivers were able to give explanations of the various sections on the curve, and were able to identify good and poor growth patterns. The results indicated that 70.0 % of mothers/caregivers interpreted the direction of the growth curve correctly. Mothers/caregivers were able to use reference curves as a clue to growth curve interpretation. This finding is confirmed by a similar study conducted in Chelston, Lusaka, Zambia and another in India in which mother’s nutrition knowledge was investigated. Results from the qualitative data also support the finding that mothers/caregivers are keen to participate in activities that promote their children's growth. As reported by other studies, this may be explained by the fact that they probably viewed themselves as partners with a role to play when engaged in the process of GMP by health care providers, a situation which allows them to claim ownership of their children’s health, as well as the overall GMP programme.

Qualitative results also highlighted that mothers/caregivers had the desire to provide better nutritional care for their children, but felt that they could not do so due to lack of adequate food and financial resources, a situation worsened by little support from health
care providers. Despite these difficulties, mothers/caregivers still indicated their willingness to respond to the advice and suggestions of health care providers by finding ways to improve their children's weight status. Mothers/caregivers expressed that they would endeavour to change their dietary practices if they were convinced that the health care provider was truly concerned about their child's health status.41

Health care providers also needed to improve the manner in which they communicated with mothers/caregivers to make the sessions more enjoyable and interactive. As the results from the qualitative data indicated, the mothers experienced the GMP sessions not to be user-friendly and reported that they were only using them as a vehicle to access other services such as immunizations and curative health care apart from weighing, despite mothers/caregivers linking GMP sessions to the importance of their children's weight. However lack of maternal satisfaction with the activities of the Lusaka GMP programme meant lack of measurable indicators that could have been used for future programme evaluation. Mothers/caregivers also indicated that they found it embarrassing and discouraging to criticise the health care providers, as there was little or no opportunity for dialogue provided by the programme.

6.2.1. Infant and child feeding practices and its impact on growth

Breastfeeding practices were found to be high with 99.6% children being breastfed at the time of the study and this was similar across all the sites. However exclusive breastfeeding was poor and it was evident that the WHO/UNICEF guidelines for exclusive breastfeeding for the first 4-6 months of the life, were not being followed.11,55 The rate of breastfeeding was compatible with those of the Zambian Demographic Health Survey (1996), in which 98.0% of infants younger than 2 years were being breastfed.

The contributing factor to why breastfeeding rates were high could be related to the breastfeeding practices encouraged within the country which promote, protect and support not only breastfeeding in general as the normal feeding practice for babies, but also exclusive breastfeeding through initiatives such as the Baby Friendly Hospital Initiative (BFHI), the Zambia Exclusive Breastfeeding Study (ZEBS) and from voluntary organizations such as the Breastfeeding Association of Zambia (BAZ) and they all
promote exclusive breastfeeding in the context of HIV/AIDS. Further through the influence of the BFHI and BAZ in the health facilities and communities, there are several mother-support groups, which promote, encourage and support mothers to exclusively breastfeed. For mothers who are HIV positive, they are provided with the correct information by specially trained breastfeeding counsellors to help them make an informed choice on the most appropriate feeding option for their children in order to reduce the risk of mother-to-child transmission of HIV. For the HIV positive mother the two recommended feeding alternatives are exclusive breast feeding or exclusive replacement feeding.

It is essential that all HIV positive pregnant women should be counselled on every contact with health workers on the feeding options available with the risks and benefits clearly explained so that they can make the most appropriate choice. Whatever choice the mother makes, appropriate support must be provided to assist her in maintaining that choice. For pregnant and lactating women who do not know their status, VCT should be discussed and encouraged, stressing the importance and benefits of being tested.

The results from this study indicated early introduction of complementary foods, by the age of at least three months, in a quarter of the children. A study conducted at Kalafong Hospital, Pretoria, South Africa on growth, feeding practices and infections in black infants found similar results with more than 80.0 % of the children still being breastfed by 12 months, while exclusive breastfeeding was not common.71 Exclusive breastfeeding is associated with positive weight gain as breast milk is sufficient for infants during this period until 4-6 months of age. Mothers' should be encouraged to delay the introduction of solid and semi-solid foods until the child is 6 months. This is because exclusively breastfed babies have a lower risk of becoming infected compared to those who are given other liquids, foods or milks in addition to breast-milk during the first months of life. Lack of exclusive breastfeeding for the recommended period of the first 4-6 months of life could have contributed to poor child growth in early life because it can put young children at increased risk of illness particularly diarrhoeal disease, which could adversely affect their nutritional status.4,57,70
6.2.2. Complementary feeding practices

The findings of this study indicated that plain soft maize-meal porridge was commonly introduced as the first food. In addition to an increased risk of illness, the early introduction of complementary foods has other deleterious effects on the nutritional status of children due to a number of reasons. Firstly, the liquids and foods offered to children may be nutritionally inferior to breast milk and, secondly, the foods offered decrease the infant’s intake of breast milk leading to weight loss or little weight gain.

6.2.3. Dietary practices

In this study it was difficult to link dietary intake to poor anthropometric status of the children, as the dietary methodology employed did not quantify food intake. However, it is commonly known that inadequate dietary intake is an important determinant in the process of linear growth retardation and, that inadequate food quantity and/or quality could have played a role in the poor nutritional status and outcome of the children in the study. It is probable that the poor dietary quality and lack of dietary variety contributed to the poor anthropometric status of the children. Most foods were low in energy with energy dense supplementary foods such as oil and margarine being occasionally added when available.

6.3 Health care providers' knowledge, attitudes and practices of growth monitoring and promotion

Children from the trained health facilities did slightly better than children at the untrained health facilities and community posts at the second and third visits. Trained health facility staff performed better, with regard to determination and interpretation of a child’s sample weight, however staff at untrained health facilities and community posts provided nutrition counselling to mothers/caregivers more frequently although this was poor for all three sites.

Although the health care providers at the trained health facilities compared to those at untrained health facilities and community posts seemed to be more knowledgeable about GMP, they demonstrated poor practices in terms of improving the health and nutritional
status of the children. For example, GMP practices such as screening of children brought for GMP sessions and nutrition counselling with specific nutrition information targeted at mothers/caregivers of high risk- children, were non-existent at trained facilities. Early detection and prevention of childhood illness through GMP is important to improve child growth and survival.20,51

Poor training and lack of supervision led to poor performance of health care providers and subsequent deterioration in children's nutritional status. In addition, an inadequate number of health care providers were previously trained in growth monitoring and promotion at trained health facilities. The Lusaka GMP programme covers an extremely large geographical area in relation to the limited number of previously trained health care providers, resulting in health care providers having a high workload. Of concern is the finding that none of the health facility managers were trained in GMP, a factor that may have contributed to inadequate support for GMP activities.

The findings of the present study seem to support those of Sabu et al.41(1993) who showed that the training of health care workers in GMP did not improve practices at trained compared to untrained health facilities. Similar findings have been reported from countries such as Peru50 and Lesotho.72 The benefits of training health care providers in growth monitoring and promotion is challenged by various authorities in the field, with regard to improving childhood nutritional status and promoting growth in children.25,33,34. A study which was done on the performance of GMP at health facilities yielded disappointing results indicating that the full potential of GMP is often not realised73. As long as health interventions are initiated in formal health centre environments, a barrier exists which discourages health care providers from executing fully activities of growth monitoring and promotion.

This study, like others, acknowledges the role that a good and effectively functioning GMP training package could play in improving and strengthening growth monitoring and promotion practices. An effective growth monitoring and promotion package comprises regular assessment of the children’s growth, making decisions about what actions the mother/caregiver should take for their child, making informed decisions about what the
community or programmes need to do to support the family, as well as follow-up on the effects of the actions taken. What emerges from this study is that health care providers trained in GMP do not individualise the nutritional advice that is, after all, one of the main reasons for the whole GMP exercise. Apart from the ineffective GMP training conducted by Lusaka district, results from the interviews with health care providers identified that other contributing factors relating to poor practices were insufficient logistics and supplies such as inadequate weighing scales and lack of basic furniture such as tables and benches at community posts and no proper shelter for conducting GMP activities were reported. Furthermore health care providers neglected the involvement of mothers/caregivers in the process of growth monitoring and promotion as they do not explain the child’s growth curve or allow mothers/caregivers to express their thoughts on their children’s condition. Out of the 698 mothers/caregivers who were interviewed, only 9.0 % indicated that they were given information on how to improve the growth curve and another 3.3 % indicated that a health worker had given them a nutrition-counselling message.

6.4. Study limitations

6.4.1. Study designs

The quantitative component had a high drop-out rate due to mothers/caregivers not keeping their appointments and their high mobility. Due to respondent and observer burden, length was measured only at the initial and final visits, which limited the shorter-term comparison of the indices of stunting and wasting throughout the follow-up period. The qualitative component during focus group discussions could have various methodological limitations, such as in the case where the moderator had difficulty in managing the debate and less control over the interview than in individual interviews.

6.4.2. Study population and sample size

Because of time and financial constraints the intended sample size could not be reached. There was also a high dropout rate, which compromised the findings of the study. It was also not possible, to have an equal number of children from the three age groups i.e. 0-5 months, 6-11 months and 12-24 months. There were fewer children in the 0-5 months
category from all sites, with community posts having the least number, while the 12-24 months category had the highest number of children, with the trained sites having the highest number.

6.4.3. Quality of data

There are unavoidable measurement and recording errors when data involving a lot of different measurements is collected. This is particularly relevant for recumbent length, which requires a special technique to obtain reliable information. Such errors in measurement could have affected the results, with regard to performance of changes in length. An effort was made to minimize measurement errors by standardizing training of field staff, in addition to stringent monitoring and supervision by the field staff supervisor and primary investigator during the entire data collection period.

6.4.4. Confounding

The possible influence of unknown potential confounding from underlying causes was controlled for through restriction and stratifying. This was done by limiting children meeting the criteria for admission to the study to 0-2 years and categorising the age groups into the following groupings: 0-5 months, 6-11 months and 12-24 months. The limited size of the study and the failure to meet the initial sample size, could not allow having equal numbers of children in each age group. This could have contributed to failure to control for the many other extraneous factors that could have complicated the study outcome as would have been necessary. Despite the fact that data on history of childhood illness and infection was not collected and excluding children with such illnesses and infection, a combination of underlying factors such as poor environmental factors, poor quality of care at health facilities compounded by socio-economic factors such as poverty could have also played a role in determining the nutritional status of the children.\cite{66,74,75}
6.4.5. Bias and validity

Bias is any deviation from the truth, or inference from the truth. Bias affects validity of the study and validity is the degree to which a test/measurement measures what it purports to measure.\textsuperscript{59,60,76}

Cohort studies are known to be expensive, in terms of financial and time constraints. Within the three-month follow-up period a large number of study participants were lost to follow-up, a situation that may have created bias in the study. However, in an attempt to investigate the potential impact of bias and confounding on the study findings, the anthropometric status (weight-for-age) of children who completed the study at fourth visit was compared to the anthropometric status of the children who dropped out of the study at each visit. The purpose of this analysis was to establish whether the children who returned for follow-up had differed, in terms of nutritional status, from the sub-group of children that had dropped out of the study. Children remaining in the study were not significantly different, in terms of change in weight for age than those who had been lost to follow-up. In other words, the reason for defaulting was not due to either further improvements or deterioration in the child's nutritional status. Techniques related to accurate data collection were standardized in the two-day training sessions. However due to logistical problems, the same field worker did not necessarily repeat the measurements on the same child during the follow-up visits.

In addition, for the purposes of analysis, the health facilities were not classified according to the original Lusaka district health management board classification of trained and untrained health facilities as earlier described in the methodology chapter. In the current study, health facilities were reclassified as “trained” if they had at least one staff member who had previously been trained in growth monitoring and promotion by Lusaka district health management board or its co-operating partners, and “untrained” if the facilities had no previously trained staff in its employ. This reclassification was necessary since the study aimed to compare the effects of training on knowledge, attitudes and practices of growth monitoring and promotion of health care providers.
6.4.6. Non-calibration of weighing scales

In all the selected health facilities and community posts that were included in the study, it was not common practice for scales to be calibrated for accuracy other than zeroing. Calibrating scales has some financial attachment to it and health facilities in the country generally face the problem of limited financial resources. Failure to calibrate weighing scales could have also contributed not only to the inefficiency of the scales but also to probably problems in recording accurate weights that were being taken.

6.4.7. Other logistical problems

- The qualitative data results also confirmed how unpredictable landlords were when it came to increasing rents. It was established during this study that some of the mothers/caregivers could shift more than once in a month, in search of cheaper accommodation. This contributed to the high loss to follow-up rate which was experienced despite numerous attempts to establish the reasons for drop-outs, it was not possible to locate most of these individuals.

- Mothers/caregivers sometimes gave false addresses, if they wanted to be attended to at a particular health facility even if their place of residence did not fall under its catchment population and area. There was no way of validating whether the mothers/caregivers had given genuine addresses and whether or not they were residents of the catchment area of a particular health facility.

- There was limited funding making it difficult to carry out the research activities as they were initially planned for in the action plan.

- The community posts were poorly equipped, with poor infrastructure, inadequate space, little or no furniture such as tables and benches making it difficult to take recumbent length of the children. There were no considerations made for recumbent length measurements in the plans when community post structures were being set up.
• Lack of audio-recording equipment for recording of the qualitative focus group discussion was a major drawback. Lack of equipment prevented the investigator from capturing some of the important responses and communication clues.

• It is also worth noting that valuable fieldwork data collection time was lost during the end of July/first week of August as it was the period for the Lusaka Agricultural Show holidays. More time still was lost during the second round of the Child Health Week. Child Health Week is a week, which is dedicated to activities that promote the health of children aged 0-5 years such as weighing, Vitamin A supplementation, immunizations, de-worming but to mention a few and it is conducted twice in a year, February/March and July/August.77 Child Health Week activities are conducted countrywide. Micronutrient Opportunities Strategic Technology (MOST), and other partners such as UNICEF support this week.

6.5. Generalizability of the study findings

The results of this study suggest that the findings are applicable to the GMP programme in Lusaka district but not necessarily to the general population of children aged 0-2 years in Zambia. However, to establish completeness and representativity of the results, future studies in other geographical areas of the country are recommended.
CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The findings of the study suggest that the Lusaka district health management growth monitoring and promotion programme is not working effectively. Health care providers at health facilities and community posts demonstrated poor growth monitoring and promotion practices. Health staff at trained health facilities demonstrated an overall better knowledge in growth monitoring and promotion than staff from the untrained health facilities, although their practices were no better. Despite children’s growth curves being interpreted correctly at trained health facilities and community posts, the information was not being translated into appropriate nutritional counselling and feeding advice for mothers. This resulted in poor nutritional outcomes for children enrolled in the GMP programme at trained and untrained health facilities and community posts. In addition, the Lusaka GMP programme relies heavily on an inadequately trained number of health care providers who are also poorly supervised and are expected to provide a service to a wide geographical area.

7.2. Recommendations

- The Lusaka district growth monitoring and promotion programme will need to ensure that a good training package, adequate logistics and supplies and appropriate supervision system are in place. Success components found in other programmes need to be implemented including strong community involvement, training, support, monitoring, supervision and a well-functioning referral system.

- Giving support to CHWs and promoting community involvement will strengthen the programme, as it will stimulate positive community action such as holding community meetings which will be used as a platform for information-sharing between the community, health facility and district levels.

- Facilitation of a better relationship between health care workers at community posts and health facilities may also lessen the workload of health care providers at the
health facilities. Establishing more community GMP points will be in line with the Zambian government’s health vision of bringing health services as close to the people as possible and in turn help to improve accessibility.

- The Lusaka district needs to promote community participation in the vision and management of the GMP programme which are still centrally defined with little or no community participation in the programme design, implementation and management. The health facility and district levels should play a greater role in supporting the programme, especially at community level.

- Establishing a strong monitoring component would provide an advantage for easier evaluation of the programme’s effectiveness. The Lusaka district will need to identify more sensitive monitoring indicators to be utilized for this purpose in order to identify weaknesses in the programme which require intervention. Since most of the children who attend GMP sessions are aged 0-2 years, Lusaka district should take advantage of this vulnerable age attending GMP sessions and target specific interventions to promote health growth.

- The Lusaka district will need to strengthen supportive supervisory skills and increase frequency of visits by district and health facility personnel to community level. This will make supervision more effective particularly for the health facility level, which is closer to the community than the district level staff. Further, there will need to be a supervisory checklist to guide the district level staff and health facility staff.

- The referral system will need to be strengthened from community level to health facility, health facility to district level and vice versa. This will at the same time strengthen the communication component between the different levels.

- A behavioural change component for health care providers needs to be included in future GMP training packages. This will make the programme more user-friendly, particularly to mothers/caregivers during GMP sessions. Aspects relating to patient’s privacy and confidentiality of information gathered, as well as ways in which to improve counselling skills are required as additional elements in health care worker
training in GMP. This will motivate more mothers/caregivers to participate and make the programme more demand-driven, thereby improving coverage. The Lusaka GMP programme may need to share experiences with other programmes that are considered successful such as the Kitwe district GMP model that was implemented with the support of a USAID funded programme, namely the Basic Support for Institutionalizing Child Survival (BASICS). The Kitwe GMP programme has developed a standard procedure for introducing GMP in the community and it has received some attention both locally and from outside Zambia. In 2002, the programme hosted trainees from 6 countries within Africa, Zambia included, for an international course in aspects of growth monitoring and promotion.

- GMP needs to be implemented through a multisectoral approach promoting partnership involvement, by linking it to other developmental interventions so as to promote sustainability. Other government sectors, together with NGOs in the country, need to be harnessed to provide a more comprehensive approach to preventing childhood undernutrition.

- The Lusaka district may also need to review their existing training GMP manuals and protocols to identify the programme's weaknesses in order to allow a uniform approach in the early detection of growth faltering. This will have to go hand in hand with a more systematic implementation strategy.

- Current curricula in place wherever nutrition is taught in the training of health care workers should be reviewed so that growth monitoring and promotion is given as much attention as other health needs in childhood, such as immunizations. Ongoing in-service training which addresses the correct interpretation of childhood growth indicators and the translation of growth curves into individualized nutritional counselling and feeding advice is key to ensuring that health care providers at all levels are kept abreast with current information and worldwide trends in the field of GMP.
• Further evaluation needs to be conducted as health care providers who were trained in both GMP and IMCI were probably concentrating more on curative health care rather than preventive care such as GMP activities.

• All health care providers that come in contact with mothers should advocate for child feeding practices that promote, protect and support exclusive breastfeeding for six months. Mothers that intend to breastfeed for prolonged periods of time should be strongly supported and advised to delay introduction of solid and semi-solid foods until the child is six months of age.

• All health care providers that come in contact with mothers should promote exclusive breastfeeding or exclusive replacement feeding in the context of HIV/AIDS. Mothers should be provided with the correct information by specially trained breastfeeding counsellors to help them make an informed choice on the most appropriate feeding options for their children with the risks and benefits clearly explained to help them make an appropriate choice in order to reduce the risk of mother-to-child transmission of HIV. This should be accompanied with appropriate support so as to enable maintaining that choice.
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APPENDICES

APPENDIX 1: CONSENT FORM FOR MOTHERS/CAREGIVERS

Dear Sir/Madam

My name is Beatrice Mazinza Kawana, a student doing a Masters in Nutrition and Dietetics at the University of Cape Town. I will be doing a study to determine the effectiveness of growth monitoring and promotion following training in your area from December 2001 – June 2002. The study will focus on children aged 0 – 2 years attending growth monitoring and promotion sessions at selected health centres and community posts.

Weight and length will be taken on all children entered in the study. Weight will be taken once every month while height will be taken twice, at the beginning of the study and at the end on the child’s last visit. All information gathered will be treated with confidence.

Your input as the caregiver/mother/guardian of the child recruited into the study will be very important. It will therefore be very crucial that you assist the research team by co-operating and providing them with all the necessary information they will request from you about your child.

However, you are informed that should you not be happy with anything in the study, you have the right to withdraw your child from the study as long as you inform the researcher. Your withdrawal from the study will not affect your future receipt of growth monitoring and promotion or health care services for your child in the area.

Please indicate your acceptance by signing below if you agree for your child to participate in this study.

I, the undersigned ____________________, caregiver/mother/guardian to ______________________, agree to participate in the above-mentioned study.

Signature: __________________________ Date: ______________

Field officer’s name: __________________ Signature: __________________
Date: ______________

Researcher’s name_____________________ Signature: __________________
Date: ______________
APPENDIX 2: CONSENT FORM FOR HEALTH CARE PROVIDERS

Dear Sir/Madam

My name is Beatrice Mazinza Kawana, a student doing a Masters in Nutrition and Dietetics at the University of Cape Town. I will be doing a study in your area from December 2001 – June 2002. The study will focus on children aged 0 – 2 years attending growth monitoring and promotion sessions at selected health centres and community posts.

Weights and lengths will be taken of children who will be entered in the study. Weight will be taken once every month while height will be taken twice, at the beginning of the study when the child is enrolled into the study and at the end of the study on the child’s last visit.

In order for this study to be successful, your input as the health care provider responsible for growth monitoring and promotion in the selected health facilities entered into the study is very crucial. You are therefore being requested to assist the research team by co-operating and providing them with all the necessary information they will request form you. All information will be treated with confidence.

However, should you not be happy with anything in the study you should feel free to withdraw your participation at any time as long as you inform the researcher.

Please indicate below by signing if you agree to participate in the study.

I, the undersigned __________________________, health provider at ___________________________ clinic, agree to participate in the above-mentioned study.

Signature: __________________________ Date: ______________

Field officer’s name: __________________________ Signature: __________________________
Date: ______________

Researcher’s name: __________________________ Signature: __________________________
Date: ______________

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APPENDIX 3 (A): EXIT QUESTIONNAIRE FOR THE MOTHER/CAREGIVER
(To be administered at the end of the first visit when child is recruited into study and at end of child’s last visit)

PLEASE ASK THE CAREGIVER/MOTHER FOR THE CHILD’S GROWTH CARD AND ENTER THE DETAILS BELOW:

Date-------/-----/------- Interviewer’s name:-----------------------------
DD/MM/YY Interviewer’s code number [ ]

Health centre: ------------------------------- Zone/community post-----------------------------
Health centre code number [ ]

1. Name of child---------------- Child’s number-----------------------------

2. Date of birth-----------------------------
   DD/MM/YY

3. Gender: 1. Male [ ] 2. Female [ ]

Mother’s name..........................................................
Address........................................................................
..................................................................................

4. Why did you bring your child for under-five clinic (weighing) today?
   1. Weighing (Growth Monitoring) [ ]
   2. Immunization / Weighing (Growth Monitoring) [ ]
   3. Child is sick [ ]
   4. Others (specify).............................. [ ]
   5. Don’t know [ ]

5. Weight at birth: -----------Kg (get from card) Today’s weight -----------Kg

Field officers to verify weight by repeating getting today’s weight

Today’s length (get the length)----------cm

Taken by field officers
6. Follow up weights:
Date........./........./........ Month 1.----------kg.
Date........./........./........ Month 2.----------kg.
Date........./........./........ Month 3.----------kg
Date........./........./........ Follow up length: ----------cm

Taken on last visit by field officers

7. Other than this child, how many children aged below five years do you have?
   1. One [ ]   2. Two [ ]   3. More than two [ ]   4. None [ ]

8. How many are less than 2 years old?
   1. One [ ]   2. Two [ ]   3. More than two [ ]   4. None [ ]

Find out if all those < 2 years have been brought and their weights and lengths taken
if not and fill in another form.
9. Was (is) your child breastfed?
   1. [ ] Yes   2. [ ] No
10. If yes for how long?
    1. Less than 3 months [ ]
    2. More than 4 months [ ]
    3. More than 6 months [ ]
    4. Other (specify) ____________________________ [ ]

11. Are there any foods you give your child other than the breast?
   1. Yes [ ]   2. No [ ]

2. What foods are these? (please tick)
   Sugar water [ ]
   Fruit juice [ ]
   Tea [ ]
   Soup or other liquids (specify) [ ]
   Porridge: Ask how thick it is when prepared? [ ]
Watery [ ]
Thick enough not drop easily from spoon [ ]
Ask if enriched and indicate with what?---------------------
Soup or other liquids (specify) [ ]
Nshima (pulp) [ ]
Relish (specify) [ ]
Sweet potato/cassava/pumpkin [ ]
Fruit (specify) [ ]
Other food (specify)------------------------ [ ]

If some foods are missed, ask which ones and include them.

---------------------------------
---------------------------------
---------------------------------

12. Since this time yesterday, how many times did (child’s name) receive main meals?
   1. Once [ ]
   2. Twice [ ]
   3. Three times [ ]
   4. More than three times [ ]

13. What foods were these (list)---------------------
    ---------------------
    ---------------------

14. Since this time yesterday, how many times did you give (child’s name) other foods other than the main meals?
   1. Once [ ]
   2. Twice [ ]
   3. Three times [ ]
   4. More than three times [ ]
15. What foods were these (list) ---------------------

----------------------------------

----------------------------------

----------------------------------

16. Who takes care of your child most of the time?
1. Grand mother [ ]
2. Older child [ ]
3. Neighbour [ ]
4. Family member [ ]
5. Friends [ ]
6. Hired helper [ ]

17. What was your child's weight today?
1. [ ]
2. Do not know [ ]

18. Show her the card and ask her to interpret her child's growth curve by indicating the direction. Was the interpretation correct?
1. Yes [ ]
2. No. [ ]
3. Does not know [ ]

19. Do you think it is important to know your child's weight?
1. Yes [ ]
2. No. [ ]
3. Does not know [ ]

If yes Why? __________________________________________________________

20. How often is your child weighed?
1. Once /month [ ]
2. Twice / month [ ]
3. More than twice / month [ ]
4. Do not know [ ]

21. In which way are you involved in your child's weighing?
1. Putting the child in the weighing bag [ ]
2. Weight reading [ ]
22. What information did the health worker tell you about your child’s growth curve today?

23. Did the health provider make any suggestion about how your child’s weight can be improved?
   1. Yes [ ]  2. No [ ]
   If yes, what were you told?

24. Are you going to practice what you have been told today?
   1. Yes [ ]  2. No [ ]
   If yes, why?
   If no, why not?

25. Were you received and handled in an appropriate manner by health providers today?
   1. Yes [ ]  2. No [ ]
26. What are the key nutrition counselling messages you have been given today?

When next are you bringing your child for GMP?

Date:---------- Month:---------- Year:----------
APPENDIX 3 (B): QUESTIONNAIRE ON MOTHERS'/CAREGIVERS' DEMOGRAPHICS

(To be administered only once at the beginning of study when child is recruited)

Date-----/-/-/------- Interviewer’s name: --------------------------------------
DD/MM/YY Interviewer’s code number [ ]

Health centre:---------------------- Zone/community post:----------------------
Child’s name---------------------- Child’s number----------------------

1. Name of mother/caregiver------------------- Mother’s/caregiver’s number-------------------
   Match with child’s number

2. Address of mother/caregiver-------------------------------
   -------------------------------------------------------------
   -------------------------------------------------------------

3. Mother/caregiver’s age ------ Date of Birth ----/-/-/-/------
   DD/MM/YY

4. Marital status
   1. Married [ ]
   2. Single [ ]
   3. Divorced [ ]
   4. Widowed [ ]
   5. Living with partner [ ]

5. Have you ever attended school?
   1. Yes [ ]
   2. No [ ]

6. What is the highest grade you completed?
   1. Primary level grade [ ]
   2. Secondary level grade [ ]
   3. Higher learning institution e.g. college [ ]
7. What is your relationship with the head of the house-hold you live with?
   1. Husband [ ]
   2. Father / Mother [ ]
   3. Uncle / Auntie [ ]
   4. Brother / Sister [ ]
   5. Others (specify) [ ]

8. What is your source of income?
   1. Has a formal job [ ]
   2. Depends on spouse [ ]
   3. Marketer/vendor [ ]
   4. Other (specify) [ ]

9. What type of housing do you have?
   1. Brick/cement/corrugated iron with electricity [ ]
   2. Brick/cement/corrugated iron without electricity [ ]
   3. Mud/grass/cardboard [ ]
   4. Other specify ----------------------------- [ ]

10. How many rooms is your house excluding bathroom, toilet and kitchen?
    1. 1 room [ ]
    2. 2 rooms [ ]
    3. 3 rooms [ ]
    4. More than 3 rooms [ ]

11. What is your main source of drinking water?
    1. Tap/piped water [ ]
    2. Well [ ]
    3. Other specify [ ]
12. Type of toilet:

1. Flush toilet in the house [ ]
2. Communal flush toilet [ ]
3. Pit latrine in yard [ ]
4. Communal pit latrine [ ]
5. No facility (bush) [ ]

6. Other specify -------------------------
APPENDIX 4: QUESTIONNAIRE FOR HEALTH WORKERS

1. Date--------/--/--
   DD/MM/YY

Interviewer's name-----------------------------------------

Code number [   ]

2. Name of health care provider: ____________________________

3. Name of health centre:  
   Code number:
   Kanyama [   ] 01 [   ]
   Chawama [   ] 02 [   ]
   Mtendere [   ] 03 [   ]
   Bauleni [   ] 04 [   ]
   Kamwala [   ] 05 [   ]
   Kabwata [   ] 06 [   ]

4. Are you trained in growth monitoring and promotion (GMP) or Integrated Management of Childhood Illness (IMCI) or both?
   1. Yes [   ] 2. No [   ] 3. One of them [   ]
      1. GMP [   ]
      2. IMCI [   ]
      3. Both [   ]

   If yes when were you trained?

   5. Other (specify)__________________________ [   ]

   What do you understand by term “growth monitoring”?
   1. Regular weighing and plotting of a child’s weight on the growth card to decide if the child is gaining enough weight or not [   ]
   2. Plotting of the weights on the children’s cards. [   ]
   3. Weighing of the children’s weights. [   ]
   4. Routine weighing, measuring the child’s height, to ascertain whether the child is growing adequately or not and finding reasons for the inadequate growth. [   ]

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5. Other (specify) ____________________________________________________________

7. What do you understand by the term “growth promotion”?
   1. Refers to the actions that are taken to make sure that children grow well or to prevent
      the further deterioration in growth of children. [ ]
   2. Nutrition and health education. [ ]
   3. Monitoring of under five children’s weight. [ ]
   4. Giving counselling to mothers. [ ]
   5. Other (specify) _________________________________________________________

8. Is growth monitoring and promotion useful in your work?
   1. Yes [ ]  2. No. [ ]
   If yes how is it useful? ____________________________________________________

9. If no, why not? _________________________________________________________

10. List the stages you would follow in determining whether the child’s weight is
     okay?

11. List the stages you would follow in determining whether the child’s weight is okay?
    1. Weigh the child [ ]
    2. Plot the weight on the growth chart [ ]
    3. See how the growth curve is appearing [ ]
    4. Giving counselling to mother [ ]
    5. Other (specify) _______________________________________________________

12. Explain how you fill calendar months on a new Under 5 growth card. The
    birth month of the child is March and you are seeing the child in June for the
    first time.
1. Write the birth month, which is March in the box and the year [ ]
2. Write the following months up to March the following year [ ]
3. Ask for the birth weight of the child, if possible ask for the birth certificate [ ]
4. Write the birth weight in the first box that is March [ ]
5. Weigh the child and plot the weight in the box showing June [ ]
6. Plot the remaining months at each visit [ ]
7. Join the weight dots [ ]

13. Plot the following weights on the attached growth card and join the weight dots.
   - March 3.5 kg
   - April 4.4 kg
   - May 4.7 kg
   - June 5.4 kg
   - July 5.1 kg
   - August 4.9 kg
   - September 4.9 kg (copy of children's card provided)

   1. Correct [ ]
   2. Incorrect [ ]

14. How would you interpret the growth curve of this child?
   1. Growing [ ]
   2. Static [ ]
   3. Losing [ ]
   4. Don’t know [ ]
   5. Other (specify) ____________________________

15. What nutrition messages would you give the mother/caregiver whose child has such a growth curve as indicated above?

How often do you liaise with the community health workers in your community in the area of GMP?

2. Daily [ ]
3. Once a week [ ]
4. Once a month [ ]
5. Once after three months [ ]
6. Do not communicate [ ]

What specific areas do you work together with the community health workers?

2. Growth monitoring and promotion [ ]
3. Immunization [ ]
4. Hygiene and Sanitation [ ]
5. All the above [ ]
6. Others (specify) _______________________________________________________________________ [ ]

Do you think children who are well nourished are a success because of the information given at GMP sessions or there could be other reasons as to why they are doing well?

1. Yes [ ]
2. No [ ]

If yes, what could be the reasons? ________________________________
__________________________________________________________________________
__________________________________________________________________________

If no, why not? ________________________________
__________________________________________________________________________
__________________________________________________________________________

19. How often should children aged 0-5 years attend GMP? Please categorize the growth monitoring schedule for the different age groups as follows:-

0-2 years
1. Once / Month [ ]
2. Once every two months [ ]
3. Only when they have vaccinations [ ]
4. Whenever necessary [ ]
3-5 years. 1. Once / Month [ ]
2. Once every two months [ ]
3. Only when they have vaccinations [ ]
4. Whenever necessary [ ]

20. Do you experience any problems when practising GMP?
1. Yes [ ] 2. No [ ]

If yes, what problems are these?
________________________________________________________________________
________________________________________________________________________

21. What recommendations would you have for the GMP programme?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
APPENDIX 5: QUESTIONNAIRE FOR COMMUNITY HEALTH WORKERS AND NUTRITION DEMONSTRATORS

1. Date--------/------/------ Interviewer’s name--------------------------
   DD/MM/Y Code number [ ]

2. Name of Community Health worker/ND/CHP: ____________________________

3. Name of health centre: Code number:
   Kanyama [ ] 01 [ ]
   Chawama [ ] 02 [ ]
   Mtendere [ ] 03 [ ]
   Bauleni [ ] 04 [ ]
   Kamwala [ ] 05 [ ]
   Kabwata [ ] 06 [ ]

4. Are you trained in growth monitoring and promotion (GMP)?
   1. Yes [ ] 2. No [ ]
      1. GMP [ ]
      2. IMCI [ ]

5. If yes when were you trained?
   5. Other (specify) [ ]

6. What do you understand by term “growth monitoring”?
   1. Regular weighing and plotting of a child’s weight on the growth card to decide if the child is gaining enough weight or not [ ]
   2. Plotting of the weights on the children’s cards. [ ]
   3. Weighing of the children’s weights. [ ]
   4. Routine weighing, measuring the child’s height, to ascertain whether the child is growing adequately or not and finding reasons for the inadequate growth. [ ]
   5. Other (specify) [ ]
7. What do you understand by the term "growth promotion"?
1. Refers to the actions that are taken to make sure that children grow well or to prevent the further deterioration in growth of children. [ ]
2. Nutrition and health education. [ ]
3. Monitoring of under five children’s weight. [ ]
4. Giving counselling to mothers. [ ]
5. Other (specify) ____________________________________________

8. Is growth monitoring and promotion useful in your work?
1. Yes [ ]
2. No [ ]
If yes how is it useful? ____________________________________________

9. If no, why not? ___________________________________________

10. List the stages you would follow in determining whether the child’s weight is okay?
11. List the stages you would follow in determining whether the child’s weight is okay?
1. Weigh the child [ ]
2. Plot the weight on the growth chart [ ]
3. See how the growth curve is appearing [ ]
4. Giving counselling to mother [ ]
5. Other (specify) ____________________________________________

12. Explain how you fill calendar months on a new Under 5 growth card. The birth month of the child is March and you are seeing the child in June for the first time.
1. Write the birth month, which is March in the box and the year [ ]
2. Write the following months up to March the following year [ ]
3. Ask for the birth weight of the child, if possible ask for the birth certificate [ ]
4. Write the birth weight in the first box that is March [ ]
5. Weigh the child and plot the weight in the box showing June [ ]
6. Plot the remaining months at each visit [ ]
7. Join the weight dots [ ]

13. Plot the following weights on the attached growth card and join the weight dots.
March 3.5 kg  April 4.4 kg  May 4.7 kg  June 5.4 kg  July 5.1 kg
August 4.9 kg  September 4.9 kg (copy of children’s card provided)
1. Correct [ ]  2. Incorrect [ ]

14. How would you interpret the growth curve of this child?
1. Growing [ ]
2. Static [ ]
3. Losing [ ]
4. Don’t know [ ]
5. Other (specify) ____________________________

15. What nutrition messages would you give the mother/caregiver whose child has such a growth curve as indicated above?

How often do you liaise with the health workers in your community in the area of GMP?

7. Daily [ ]
8. Once a week [ ]
9. Once a month [ ]
10. Once after three months [ ]
11. Do not communicate [ ]

What specific areas do you work together with the health workers?

7. Growth monitoring and promotion [ ]
8. Immunization [ ]
9. Hygiene and Sanitation [ ]
10. All the above [ ]
11. Others (specify) ____________________________ [ ]

Do you think children who are well nourished are a success because of the information given at GMP sessions or there could be other reasons as to why they are doing well?

1. Yes [ ]
2. No [ ]

If yes, what could be the reasons?
__________________________________________________________________________
__________________________________________________________________________

If no, why not?
__________________________________________________________________________
__________________________________________________________________________

19. How often should children aged 0-5 years attend GMP? Please categorize the growth monitoring schedule for the different age groups as follows:-

0-2 years
1. Once / Month [ ]
2. Once every two months [ ]
3. Only when they have vaccinations [ ]
4. Whenever necessary [ ]

3-5 years.
1. Once / Month [ ]
2. Once every two months [ ]
3. Only when they have vaccinations [ ]
4. Whenever necessary [ ]

20. Do you experience any problems when practising GMP?
1. Yes [ ] 2. No [ ]

If yes, what problems are these?

________________________________________________________________________

________________________________________________________________________

21. What recommendations would you have for the GMP programme?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
APPENDIX 6: IN-DEPTH INTERVIEW WITH STAFF MEMBER IN-CHARGE OF HEALTH FACILITY

1. Date---------/--------/--------
   DD/MM/YY

2. Name of staff in charge of health centre:----------------------------------------

3. Name of health centre: Code number:
   Kanyama [ ] 01 [ ]
   Chawama [ ] 02 [ ]
   Mtendere [ ] 03 [ ]
   Bauleni [ ] 04 [ ]
   Kamwala [ ] 05 [ ]
   Kabwata [ ] 06 [ ]

3. Have you been trained in Integrated Management and Childhood Illnesses (IMCI) or growth monitoring and promotion (GMP) or both?
   0. Not trained [ ]
   1. GMP [ ]
   2. IMCI [ ]
   3. Both [ ]

4. If yes when were you trained:
   GMP:
   IMCI:
5. How many of your staff have had training in either IMCI or GMP or both?

Number trained in GMP--------

0. None [ ]
1. One [ ]
2. Two [ ]
3. Three [ ]
4. Four [ ]
5. More than four [ ]

Number trained in IMCI--------

0. None [ ]
1. One [ ]
2. Two [ ]
3. Three [ ]
4. Four [ ]
5. More than four [ ]

Numbers trained in both ---------

0. None [ ]
1. One [ ]
2. Two [ ]
3. Three [ ]
4. Four [ ]
5. More than four [ ]

6. As the manager in charge what is your role regarding the running of the GMP programme?

1. Write regular reports of progress of the GMP [ ]
2. Identify children in danger of malnutrition and put in measures to prevent the onset of malnutrition [ ]
3. Providing in-service training to health workers on GMP [ ]
4. Other (specify) _________________________________

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7. What has been done to facilitate the running of the GMP programme at your facility?
   1. Making supplies available [ ]
   2. Training some staff [ ]
   3. Conducting supper-market approach [ ]
   4. Others (specify) __________________________

7. Can you comment on the usefulness of the GMP programme

8. What would you say are the successes of the GMP programme?

9. Is there anything else you would like to be done in the running of the GMP programme?

10. Are there any problems your health facility maybe facing in implementing GMP?

11. What are your recommendations for the improvement of the programme?
APPENDIX 7: GUIDE QUESTIONS FOR FOCUS GROUP DISCUSSION WITH MOTHERS/ CAREGIVERS

Number to be conducted: 4 Focus Group Discussions (FGDs)

2 FGD each for trained and untrained health facility
1 FDG for community post

Introduction:
My name is ................................ and I would like to thank you for finding time to come and attend this discussion. It is going to be a discussion on growth monitoring and promotion and information from our discussion will be used in making future improvements of the GMP programme. The information from the discussion will be treated with confidentiality.

1. Number of mothers/caregivers attending FDG.

2. Ages of mothers/caregivers attending:
   (i) ---------years (vi) ---------years
   (ii) ---------years (vii) ---------years
   (iii) ---------years (viii) ---------years
   (iv) ---------years (ix) ---------years
   (v) ---------years (x) ---------years

3. Do you think it is important to bring children for under five clinic?
   If yes why?
   If no why not?

4. Do you think it is important to monitor the growth of children?
   If yes why?

5. What information is given by health workers about the growth of your child?

6. Is the information useful to your children’s situation?
7. If Yes, describe how

8. If No, why not?

9. In which ways have you been able to put the information you received at the clinic into practice?

10. What barriers have you been facing to implementing these practices?

11. Can you comment on how feasible it is to bring your child for regular weighing?

12. What do you think you can do to help improve your children’s weight?
APPENDIX 8: OBSERVATION CHECKLIST

1. Setting up of scale:
   Hanging of scale on strong support
   Dial of scale at eye level
   Zeroing the scale
   Testing for accuracy of scale with known weight

2. Is the child undressed before weighing/weighed with minimum (underclothes only) clothing?

3. Is the caregiver/mother assisted to put the child in bag?

4. Weighing of child:
   Putting of child into weighing bag
   Is the child hanging freely in bag from scale (not touching anything)?

5. Reading of scale:
   Scale read at eye level facing dial
   Read when needle is steady and to nearest 100 gm
   Note today’s weight of child -------------- Kg (repeat weight if child is recruited into study)

6. Plotting of weight:
   If seeing child for first time, how are the calendar months filled in on the card?
   1. Correctly [   ] 2. Incorrectly [   ]
   Take note of birth month and if filled first.
   1. Yes [   ] 2. No [   ]
   How is the weight plotted on the card (on line or middle of box)?
   1. On line [   ] 2. Incorrectly [   ]
   How are the weight dots joined to make growth curve
   1. Correctly [   ] 2. Incorrectly [   ]
7. Interpretation of weight:
   Is the weight of child interpreted correctly i.e adequate weight gain, not enough
   weight gain or static or loss of weight?
   1. Correctly [ ] 2. Incorrectly [ ]

8. Taking of recumbent length: (by research field officers)
   Today’s length----------Cm

9. Counselling:
   Where is counselling done? (Privacy and individually)
   1. Individually and privately [ ]
   Does the health provider inquire about child’s health?
   1. Yes [ ] 2. No [ ]
   Is mother given chance to talk?
   1. Yes [ ] 2. No [ ]
   Is mother allowed to make final decision on what she can do home?
   1. Yes [ ] 2. No [ ]
   What is the information given?

---------------------------------------------------------------------

Is the information relevant to the child’s condition?
1. Yes [ ] 2. No [ ]

Are they using the counselling cards correctly?
1. Yes [ ] 2. No [ ]

Does mother agree to try it home?
1. Yes [ ] 2. No [ ]

Does health provider relate counselling to child’s weight/condition?
1. Yes [ ] 2. No. [ ]
### APPENDIX 9: ANTHROPOMETRIC CLASSIFICATIONS OF CHILDREN AT SECOND FOLLOW-UP VISIT

<table>
<thead>
<tr>
<th>Weight-for-age</th>
<th>≤ -3</th>
<th>-3 to &lt;-2</th>
<th>-2 to &lt;-1</th>
<th>-1 to 0</th>
<th>0 to &lt; 1</th>
<th>1- to &lt; 2</th>
<th>≥ -2</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained health facilities</td>
<td>15 (4.8)</td>
<td>41 (13.1)</td>
<td>108 (34.6)</td>
<td>96 (30.8)</td>
<td>43 (13.8)</td>
<td>9 (2.9)</td>
<td>0</td>
<td>312</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>4 (5.0)</td>
<td>15 (18.7)</td>
<td>29 (36.3)</td>
<td>22 (27.5)</td>
<td>9 (11.3)</td>
<td>1 (1.2)</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>Community posts</td>
<td>4 (8.7)</td>
<td>5 (10.8)</td>
<td>19 (41.3)</td>
<td>12 (26.0)</td>
<td>6 (13.0)</td>
<td>0</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23 (5.3)</td>
<td>61 (13.4)</td>
<td>156 (35.6)</td>
<td>130 (29.6)</td>
<td>58 (13.2)</td>
<td>10 (2.3)</td>
<td>0</td>
<td>438</td>
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</table>

### APPENDIX 10: ANTHROPOMETRIC CLASSIFICATIONS OF CHILDREN AT THIRD FOLLOW-UP VISIT

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<thead>
<tr>
<th>Weight-for-age</th>
<th>≤ -3</th>
<th>-3 to &lt;-2</th>
<th>-2 to &lt;-1</th>
<th>-1 to 0</th>
<th>0 to &lt; 1</th>
<th>1- &lt; 2</th>
<th>≥ -2</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained health facilities</td>
<td>7 (3.6)</td>
<td>24 (12.3)</td>
<td>77 (39.5)</td>
<td>60 (30.8)</td>
<td>27 (13.8)</td>
<td>0</td>
<td>0</td>
<td>195</td>
</tr>
<tr>
<td>Untrained health facilities</td>
<td>3 (5.6)</td>
<td>12 (22.2)</td>
<td>21 (38.9)</td>
<td>14 (25.9)</td>
<td>4 (7.4)</td>
<td>0</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Community posts</td>
<td>1 (4.3)</td>
<td>3 (13.0)</td>
<td>8 (34.7)</td>
<td>7 (30.4)</td>
<td>4 (17.4)</td>
<td>0</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11 (4.0)</td>
<td>39 (14.3)</td>
<td>106 (38.9)</td>
<td>81 (29.8)</td>
<td>35 (12.8)</td>
<td>0</td>
<td>0</td>
<td>272</td>
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</tbody>
</table>

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APPENDIX 11: Transcript on Focus Group Discussion deliberations held at Bauleni health facility, 19th December, 2002

Demographic characteristics of mothers/caregiver’s.

There were 6 mothers in attendance. Mean age for mothers/caregivers 24.5 (SD = 4.7) years. See details below.

<table>
<thead>
<tr>
<th>Mother’s code</th>
<th>Age</th>
<th>Marital status</th>
<th>Mothers’/caregiver’s No. (Same as child’s code)</th>
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</thead>
<tbody>
<tr>
<td>M1</td>
<td>28</td>
<td>married</td>
<td>4001</td>
</tr>
<tr>
<td>M2</td>
<td>19</td>
<td>married</td>
<td>4004</td>
</tr>
<tr>
<td>M3</td>
<td>22</td>
<td>married</td>
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</tr>
<tr>
<td>M4</td>
<td>23</td>
<td>married</td>
<td>4076</td>
</tr>
<tr>
<td>M5</td>
<td>32</td>
<td>married</td>
<td>4089</td>
</tr>
<tr>
<td>M6</td>
<td>23</td>
<td>married</td>
<td>4091</td>
</tr>
</tbody>
</table>

After refreshments and when everyone had settled, formal introductions were done and thereafter the focus group discussion started.

Moderator:  Let us start by you giving me your views on whether you think it is important to bring your children for under-five clinic, and if so why?

*M4:  Yes, It is important to bring children for U5.

All other mothers nodded in agreement with the answer.

Moderator:  Since you all agreed could you tell me why you think it is important to bring your children for U5 clinic?

*M4:  When we bring our children for U5 clinic the nurses teach us different things like how to feed them, how to prevent diseases like diarrhoea.

*M2:  It is important because the children are given injections to protect them from diseases like measles.

*M1:  They give us lessons on how to breastfeed our children; prevent malaria and how to feed our children.
M5: At under-five clinic you can also know the "scale" of your child whether it is going up or down.

Moderator: Okay, how would you know the scale?

M5: They will put the child on the scale before they give the injection. The nurse tells you as the mother/caregiver the child's scale for that day. Sometimes the nurses do not say anything after telling you the scale for the child, it means the child is okay.

M4: Sometimes even when the child is not okay they don't say anything, the nurse will only tell you the weight of the child for that day. It has happened to me before. You know sister we are many at the U5, so sometimes the nurses work fast. Immediately your child comes out of the scale another one goes in and that is it with you.

M3: You can also know if the child is growing well or not at U5.

Moderator: Okay, how would you know that?

M3: When the nurse tells me to put the child on the scale she will tell me the weight of my child. As a mother/caregiver you know if last month the weight was 5 kg and today she tells me 6 kg, you will know the child is growing as the weight has gone up and means the child is not sick.

M1: Eeeeh, if the weight is 5 kg today and last month it was again 5 kg then the child is not well and not growing. For me sister I feel good when I am told the weight has gone up because you know what the nurses sometimes don't talk nicely to us if the scale has gone down.

Moderator: Okay with all that said do you think it is important to monitor the growth of your children?

M6: Eeeeh, because how else can you know if your child is growing or not. I will know that things are okay in the body of my child if the weight is going up.

M3: It is important because it makes you know if the child is healthy or not when the weight is going up or down. The scale of the child tells us things about the child. With slight laughter, you know what sister these days, there are a lot of diseases so one has to
be concerned about the child’s weight and as the other mother/caregiver said earlier if it is going up you feel good as a mother because you know you are also okay and you can only know the scale of your child if you come to the under-five clinic.

Eeeeh, All mothers/caregivers laugh and agree with the statement.

Moderator: uuuuum, you make it sound like it is a big thing when you are told the weight has gone up, is that the way it is?

M2: Oh eeeh, there is AIDS these days and you can’t know sometimes until you see your child is not gaining weight and is always sick. So when the nurses tell you the scale for your child at under-five clinic you feel good if it has gone up.

M3: It is also good to know how the scale is going because it means as a mother you are caring for the child well. So you can try to make sure it does not go down, as it is not a good sign.

Moderator: What information do health workers give you about the growth of your children?

M5: They tell us to feed our children porridge with eggs, Soya and give other foods like banana, oranges and anything, just anything so that the weight of the child does not go down.

M6: Aaah, ummm, only sometimes the nurses will say something. They tell us not to give our children porridge made of mealie-meal only but add groundnuts, oil or eggs. But sister we very much want our children not to lose weight but these foods they tell us to give our children we can’t afford them. You know life is difficult these days. Only sometimes they can say something like feed your child well.

M1: Eeeeh sometimes yes they can say something but not always, you know sister if you miss the lesson at the beginning before they start giving injections then that is it they wont tell you anything. They will wait for a lot of mothers to come and then they teach on diarrhoea, malaria, cleanliness and other things. But if you are late you miss and they will not say anything.
M3: For me I have never had anything from them. These nurses you see have got no time to discuss with us since they always say they are very busy.

M4: I also agree with M3, since I came to Bauleni, they have never told me anything on what to give my child. But where I was staying before in Chelstone, my child had diarrhoea they gave me madzi-a-moyo and how to use it and the nurse told me how to feed my child.

Moderator: So does this mean you all come early for U5 so that you listen to the lessons from the nurses?

M2: For me before yes I used to but not now because when you come early you stay longer at the clinic.

Moderator: You stay longer, how?

M2: The nurses will wait until the mothers are many before the lesson or weighing can begin. They will get the child's card and put it on top so that those who come late their children's cards will be at the bottom and you can't leave without the card. When they begin to weigh, they call out the cards one by one from the top to bottom. The cards will be put like that even when the lesson is going on.

Chorus approval from M2 and M4 agreeing with the above statement.

M1: Eeeh sister once you miss or come late then that is it they wont tell you anything, even just telling you your child's scale is going up apart from telling you the weight for that day.

Moderator: For those of you who have said they are given information, do you find it useful for your children's situation? And if you do describe how?

M1: Eeeh it is useful. My neighbour's child was not well and the weight had reduced and she was told by the nurse to feed her child on fruits, eggs and rice and although it was difficult she tried and after sometime the weight increased. So the information is helpful so that we know how to look after our children so that they grow well.
M5: The information is useful because it helps you to feed the child well so that the child can grow well. The only problem is that we can't afford these foods every time. Otherwise it helps us to know what to do when it comes to feeding our children. However we try hard in all possible ways to get the foods so that next time when you take the child for under-five clinic the weight has improved.

M4: Although the nurses have never told me anything, information on how to look after our children properly would be helpful, as it would help so that the weight doesn't go down. It is only that these foods they tell us are expensive we can't afford them. I can cook porridge may be only once and the child will the rest of the time eat when we all eat.

M3: The information is helpful if only they could tell us properly. You know sister children are difficult to feed and sometimes they eat sometimes they refuse. In most times we give our children whatever we have but they will cry for something else. Like now my child cries for eggs and only wants eggs. I can buy one or two eggs but after that where do I get the money to buy more eggs?

M1: You know sometimes in order not to be embarrassed even if you don't have the foods that they are telling you or can't afford them to give to your child, you just agree to what the nurses are telling you. If you answer them back that you can't afford them they will just embarrass you in front of other mothers/caregivers. Because if you don't have the means to do it, how do you do it? You don't have sister and that is it.

Moderator: Could you tell me how you have been able to put the information you received into practice?

M2 shared her experience. A neighbour never used to bring her child to the under-five clinic and the child looked very sick. I managed to convince my neighbour to bring the child to the clinic and they even gave the child Soya at the clinic. The child is much better now although not completely well.

M4: You know sister some mothers say their children will get sick when they bring them to the under-five clinic when they are given injections. Other mothers say there is no difference between children who are brought to the clinic for under-five clinic and those who don't. Just like M2 has said even me my neighbour was told by her mother-in-law to stop taking her child for under-five clinic because the child would get sick after the
injections. I told her that it was not true because my child has never been sick and she should just bring her child to the clinic.

**Moderator:** That is interesting. Are there any more barriers you have been facing in implementing these practices?

**M1:** Yes money problems. For me I can't afford these foods because the father to my child has been sick so he hasn't been going for work for 3-4 months now.

**M3:** Money is needed to buy anything and do anything. For me sister the problem is that my uncle is unemployed and we are many at home. It is difficult to find money and it is never enough.

**M5:** Sometimes the child has no appetite even if food is there. Even when you try to feed as much the child won't just eat.

**M6:** Money is not enough and difficult to find. It is worse for me because my husband sometimes does not get paid on time and it is also not a lot of money; they always get their salaries late. We struggle a lot to feed our family.

**M4:** Sometimes it is difficult to find time to care for the child because I am a marketer. I have to go and make orders and I find it difficult to always just find time and I don't have anyone to help me look after the child.

**Moderator:** Is there anything else any one would like to add?

**M2:** When we tell the nurses that we don't have food to give to our children when they tell us to feed them on the foods they tell us to give them, why don't they give us Soya from the clinic?

**Moderator:** Why do you want them to give you soya?

**M2:** Because that is what they tell us to feed our children. They say give the child at least soya. They tell us to buy soya and yet they have some at the clinic. Even when you explain that you will just give the sick child they refuse to give even a little and say we give it to our husbands. Big laughter from all mothers. Honestly sister how can I give soya to my husband at the expense of our child?
Moderator: ummm, but do you do that? Is there anything else you would like to add?

M5: Yes, aah, uum, you know sometimes you really feel eeh you want to do something when they tell you to do it or maybe even want to ask something, but we can’t ask, as we are scared. You know when there are many mothers and you are in a queue, the nurses don’t answer well and it is very embarrassing and discouraging.

M6: Eeh, they don’t answer properly. When the child loses weight and the nurse notices, why do they ask questions like "Why don’t you feed your child properly." They do this without even asking if we can afford the foods. You just want us to give you Soya so that you go and eat with your family. They say all these things when the child is still in the scale bag. I have never fed my family on Soya, it is only that my child is sick that is why the child has lost weight. They tell us off in front of other mothers, these nurses should be told that they talk to us properly.

Moderator: Can you comment on how feasible it is to bring your children for regular weighing?

M3: It is very easy and time is not a problem. It is easy because children are only taken for U5 once a month unless if the child is sick, it is easy as it is not on daily basis. Even if you have a commitment the day of the appointment, you can take the child to the clinic any other day.

M1: Under-five is free at the clinic, it is just that we are many and spend a long time at the clinic because the nurses want us to wait, but it is easy to bring children to the clinic.

M2: Sister there is no problem with bringing the child to U5 clinic. You simply leave whatever you are doing as the child’s health is important. Mothers who don’t bring their children are just lazy, and not interested in their children’s health, we see them in the compound. They would rather sit and chat with friends.

M5: Some mothers don’t bring their children for U5 clinic because “they think their children are healthy” just by “the look”. You cannot know if the child is healthy in the body by just looking unless you take it to the clinic.
M4: It is easy and there are no problems except that sometimes you can miss because the clothes are dirty. Soap is a problem to find.

Moderator: uuuurn, What is more important your child’s health or staying at home because the clothes are dirt?

M4: Of course it is the child’s health that is more important. But you know it is embarrassing to come to the clinic looking dirty. The women at the clinic talk a lot and even the nurse do talk too.

Moderator: What do you think you can do to help improve your children’s weight?

M6: Maybe to have a small garden at the clinic where we can grow vegetables so that we sell to raise money to buy Soya for feeding our children. Most of us don’t have gardens at home because the plots are very small.

M1: Even if I could grow vegetables at home it would be difficult because it is not our house. Landlords change their minds just like that. They hike the rent anytime without warning, and once they do that you have to pay or you are out and shift to a place you can afford. We can shift any time when the rent is hiked if we don’t have money to pay. Also some landlords don’t allow us to have gardens.

M3: Do something so as to raise money to buy food for the child.

Immediate interruption from M6. How do you do that something if you don’t even have money to buy food for the child?

M3 continues: Then in that case even just keeping the environment clean so that my child does not get sick especially diarrhoea.

M4: It is difficult but maybe just to continue feeding the child whatever food we have it is better than not giving the child anything.
Moderator: Does anyone still have anything to say or add on what has been already said?

Silence

Okay, Can I now summarize what we have discussed today then?

(i.) You all agreed that it is important to bring the children for U5 clinic. You said that it is important because at under-five you know about the weight of the child and how the child was growing, if it was healthy or not.

(ii.) You also attend under-five clinic so that the child could be given injections to prevent diseases like measles and you are taught on how to feed the child.

(iii.) You also mentioned that it is important to monitor the growth so that you know how the child was growing and you can know that the child is okay if the scale was increasing.

(iv.) Nurses give you information on how to feed your children but it is not always that they did that, as they were sometimes too busy to discuss with you. However you have found the information they gave to be helpful, as you have applied it to various situations at home.

(vi.) The biggest barrier you have in implementing what you are told is lack of money as without money you cannot buy food required to feed your children.

(vii.) You don't have any problems in bringing your children for U5.

(viii.) You would love to have a small garden at the clinic where you can grow vegetables for sale to raise money to buy Soya so that you feed your children for their weights improve.

(ix.) Nurses don't talk to you in a pleasant manner; they need to change their approach towards you. Nurses also need to be more confidential when they talk to you.

Have I mentioned everything or maybe there is something I have left out which you can think of?

Silence.

I thank you very much for being so helpful and for finding time to come, God bless.

Eeeeh = Yes