A description of Growth Monitoring and Promotion activities at primary care level in Grahamstown, Makana Sub-District, Eastern Cape

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BY
Zitandile Hlombekazi Mfono
Student No. : 992225486

SUPERVISOR
Professor Meera Chhagan
Department of Paediatrics and Child Health, University of KwaZulu-Natal and School of Public Health, University of the Western Cape

CO-SUPERVISOR
Dr Anna Voce
Discipline Public Health Medicine, University of KwaZulu-Natal

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DEDICATION

Glory to GOD.
"And you shall remember the Lord your GOD, for it is He who gives you power to get wealth." Deuteronomy 8:18.

Dedicated to the memory of my late research supervisor, Professor Meera Chhagan

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Makana Sub-District Integrated Nutrition Programme Personnel	Ms. P. Hermans and Ms. Y. Manikivana

Clinic Personnel in Grahamstown PHC Facilities

Settlers Hospital Management and Staff

Department of Health Eastern Cape

DECLARATION

I Zitandile Hlombekazi Mfono declare that:

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ABSTRACT

Aim

To describe growth monitoring and growth promotion (GMP) activities in children aged 0-24 months at primary healthcare facilities in Grahamstown, Makana Sub-District, Eastern Cape.

Methods

A cross-sectional descriptive study design was implemented. A sample of one hundred and sixty-four children from birth to twenty four months attending seven clinics in Grahamstown for well-baby visits, sick visits and growth monitoring and promotion from November 2012 to January 2014were included in this study. A Road-to-Health Booklet audit checklist and caregiver questionnaire were used to collect the data. Frequency distributions were reported for appropriate GMP activities. Appropriate GMP was defined as: correct use of weight-for-age index; growth interpreted correctly and discussed with caregiver; interventions promoted or given as indicated; and follow-up scheduled according to the relevant Department of Health policies.

Results

From the Road-to-Health Booklets sampled at the seven clinics and from caregiver interviews forty-seven (28.7%) of the children had evidence of appropriate GMP, although the majority of children sampled were weighed at their clinic visit. One hundred and twenty (80.0%) of the caregivers reported that their children were weighed by community health workers. The prevalence of appropriate GMP was significantly different according to the primary healthcare facility attended by the child ($p=0.046$ for the seven facilities using Fisher's exact test). In the children sampled, seventeen (18.1%) had a recorded length in their Road-to-Health Booklet and for only nine (10.0%) of the children was the length for age plotted. There was no documented evidence in any of the Road-to-Health Booklets indicating that length measurements were interpreted.

Discussion

There is over emphasis on the technical aspects of GMP such as weighing of children, i.e. growth monitoring compared to growth promotion. Optimal GMP practice requires growth measurement, interpretation and intervention, e.g. nutritional counselling for growth promotion, with caregiver engagement in discussions about child growth.
Sub-optimal GMP persists after the implementation of the new Road-to-Health Booklet, as evidenced by: inadequate interpretation of growth indices; lack of appropriate interventions for growth faltering; and poor follow-up. Length-based measurements are not used routinely in child growth assessment since their addition to the RTHB in 2010.

Conclusion

Implementation of quality growth monitoring and promotion activities at primary care facilities in Grahamstown remains problematic after the introduction of the revised Road-to-Health Booklet and additional growth indices.

PRESENTATIONS

Poster presentation at the Public Health Association of South Africa conference in Polokwane, South Africa on the 5 September 2014.

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DEFINITION OF TERMS

Community health workers: a lay worker whose primary function is to promote basic health and health services within the home or primary health care facility.(1)
Growth faltering: Growth faltering is identified by emphasizing the direction of growth obtained in serial recordings, rather than the actual weight-for-age itself. No change or an actual decrease between successive measurements is taken as a sign of growth faltering.(2)
Growth monitoring: The process of following the growth rate of a child in comparison to a standard by periodic anthropometric measurements in order to assess growth adequacy and identify faltering at early stages.(3)
Growth monitoring and promotion: is a prevention activity that uses growth monitoring to facilitate communication and interaction with caregiver and to generate adequate action to promote child growth.(3) GMP can also detect children who are malnourished or at risk of malnutrition. In this study, the weight for age index was used to determine appropriate GMP as it is the most commonly used index in this area.
Healthcare workers: in this study included all nursing staff (professional nurses, enrolled nurses and nursing assistants), community health workers, health educators and clinic assistants involved in well baby and sick child consultations and involved in GMP.
Length/height for age index: detects stunting in child growth monitoring, a more chronic form of undernutrition. (4)
Malnutrition: refers to both under and over nutrition, but in this study it will refer to undernutrition.(5)
Nutrition counselling: Nutrition counselling is a supportive process, characterized by a collaborative counsellor–patient/client relationship integrating information obtained from assessment of growth and caregiver information to establish food, nutrition and other health priorities, goals, and action plans to ensure adequate child growth; it empowers the caregiver to take responsibility for child-care to treat an existing growth problem and/or to promote growth. (6)
Not growing well: if the if the child has lost weight since the previous month or if the child did not gain weight at least one month earlier or for more than one month (i.e. flat curve) or if the child has a "low weight/length/height" (i.e. if the child is below the -2 line or 3rd centile).(4)
Primary healthcare facilities: fixed clinics open eight hours per day.(7)
Undernutrition: child undernutrition manifesting as physical growth restriction identified as underweight for age, stunting and wasting.(5)
Weight for age index: detects underweight for age in child growth monitoring.(4)
Weight for length/height index: detects wasting in child growth monitoring, an acute state of undernutrition.(4)

LIST OF ABBREVIATIONS

CHWs	Community Health Workers
Child PIP	Child Problem Identification Programme
GM	Growth monitoring
GMP	Growth monitoring and promotion
INP	Integrated Nutrition Programme
IMCI	Integrated Management of Childhood Illness
NFCS	National Food Consumption-Fortification Baseline survey
PHC	Primary Health Care
RTHB	Road to Health Booklet
RTHC	Road to Health Card
SANHANES-1	South African National Health and Nutrition Examination Survey
UKZN	University of KwaZulu-Natal
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER I: INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Globally, undernutrition underlies almost half the mortality in children younger than five years, with the highest burden in developing countries.(8) In consecutive Saving Children Reports, (9, 10) undernutrition has been reported as a major contributor in the deaths of children younger than five years at South African healthcare facilities. Growth monitoring has been widely implemented since the 1980s as part of child health programmes to detect early undernutrition in children. Growth monitoring and promotion was part of the GOBI-FFF[1]strategy, and is used routinely in infant and child health programmes at primary healthcare (PHC) facilities.(3) The United Nations Children Fund (UNICEF) has been a strong proponent of child growth monitoring and promotion, offering both technical support and equipment at the inception of such programmes in developing countries.(3, 11) From the beginning, growth monitoring and promotion programmes have emphasised the technical aspects of weighing and plotting. As a result, the counselling and other growth promotion activities often have been neglected. Refocusing growth monitoring to include promotional activities necessitated the use of "growth monitoring and promotion" be adopted in place of just using the term growth monitoring (GM).(11) Growth monitoring and promotion (GMP) is a strategy widely used for the early detection of growth faltering, promotion of child growth, and prevention of undernutrition.(3) In recent years, GMP has been criticised for lack of impact on child health outcomes.(3, 11) A number of reviews of growth monitoring programmes attempted to clarify the value of GMP for child health. The World Health Organization (WHO) growth standards also refocused attention on GMP.(3, 5, 11)

GMP is part of the package of PHC services in South Africa and is prioritised as a platform for delivering infant and young child feeding education and counselling, and prevention of severe malnutrition.(12, 13) Nutrition assessment using growth charts and counselling on feeding, especially at sick child visits, is also included in the Integrated Management of Childhood Illness (IMCI) strategy that is implemented at PHC facilities in South Africa.(11, 14, 15) Growth monitoring and growth promotion for children at PHC facilities in South Africa is often implemented inefficiently.(3, 12, 16) Problems often arise from poor implementation of the growth promotion activities, in particular nutrition counselling, with GMP appearing to be effective in improving children's nutritional status.(11) Identification at PHC facilities of children at risk of undernutrition or who are undernourished has also been observed to be suboptimal.(12, 17)

The launch of the new Road to Health Booklet (RTHB) in South Africa, incorporating the WHO growth standards, was envisaged to be an opportunity to revitalise GMP. The WHO growth standards were launched internationally in April 2006, adopted for use in South Africa in 2010, and incorporated into the RTHB for children under five years of age.(12, 18) The new RTHB included more child growth indices, i.e. length/height for age and weight for length/height indices, compared to the previous Road to Health Card (RTHC) that only used weight for age. The additional indices in the new RTHB have been included to assess for stunting, overweight/obesity and wasting. The new RTHB was seen as an opportunity to strengthen GMP implementation through training and retraining of health workers in GMP.

[1]GOBI-FFF: Growth monitoring, oral rehydration, breastfeeding, immunization, family planning, food supplementation and female literacy

The GMP training was extended to include other categories of healthcare workers, i.e. enrolled nurses, nursing assistants and community health workers (CHWs) working in the ward based outreach teams, as it was observed that other categories besides professional nurses are more involved in GMP. The CHW also conduct GMP in the facilities to ease the workload on nursing staff before going out to outreach work.(12, 13)

1.2 BACKGROUND

Child undernutrition is a public health concern in South Africa, and is an outcome indicator for poverty and deprivation.(19) Although poverty levels in South Africa have been declining, the inequitable distribution of resources within the country still prevails.(20) Addressing child undernutrition is a priority of the Department of Health, as it can lead to reduction of child mortality and increasing life expectancy, which are key outcomes in the national strategic health plan.(12)

Among the nine South African provinces, in 2011 the Eastern Cape Province had the second largest proportion of people living in poverty after KwaZulu-Natal.(20) Severe acute malnutrition, an indicator associated with poor socio-economic status, in children under five years in the Eastern Cape increased in the period from 2012 to 2013, and was observed to be higher in the more deprived areas of the country.(19) The Cacadu (Sarah Baartman) district of the Eastern Cape also had an increasing incidence of severe acute malnutrition from 2009 to 2013, with an incidence higher than the national average in 2012/13.(19) Quality GMP can potentially be a strategy for reducing the incidence of severe acute malnutrition and chronic undernutrition (stunting) that has been reported in the Cacadu (Sarah Baartman) district, in which Grahamstown the study area falls under. Revision of the RTHB and training in GMP were targeted to close the GMP implementation gap and improve the quality of GMP.(21) It is unknown whether the practices in growth monitoring and growth promotion following training and implementation of the new RTHB in the Cacadu (Sarah Baartman) district have improved.

1.3 AIM AND OBJECTIVES

The aim of this study was to describe the practice of growth monitoring and promotion using the new South African RTHB for children from birth to twenty-four months, attending PHC facilities in Grahamstown, Makana sub-district, Sarah Baartman District, Eastern Cape, during the period of November 2012 to January 2014.

The specific objectives of the study were as follows:

a. To measure the proportion of RTHBs of children 0-24 months that demonstrate appropriate growth monitoring and growth promotion in PHC facilities in Grahamstown, Makana sub-district, from November 2012 to January 2014.
b. To determine caregiver knowledge, experiences and perceptions about the link between growth monitoring and promotion and their child's health and nutritional status.

1.4 ORGANISATION OF THE REPORT

The research report has been organised as follows:

1. Chapter 1: Introduction to undernutrition in South Africa and the GMP strategy
2. Chapter 2: Literature review on GMP and reduction of undernutrition
3. Chapter 3: Methods for data collection and analysis
4. Chapter 4: Presentation of results

5. Chapter 5: Discussion of results in relation to evidence on GMP
6. Chapter 6: Recommendations for improving implementation of GMP and for further study

CHAPTER II: LITERATURE REVIEW

2.1INTRODUCTION

Child undernutrition is a major public health concern in many developing countries as it is an underlying contributor to childhood morbidity and mortality. It is now recognised that even mild to moderate forms of undernutrition contribute to increased childhood morbidity and mortality especially in low and middle income countries.(8, 22, 23) The Child Problem Identification Programme (Child PIP) in South Africa reports on the audits of child deaths at healthcare facilities. The Child PIP data revealed that almost 30% of children aged under five years who died at participating hospitals were underweight and an additional 34% were severely malnourished.(9)

Undernutrition in children can manifest as underweight (low weight for age), stunting (low length/height for age) or wasting (low weight for length/height). Also now recognised as childhood undernutrition is intrauterine growth restriction, which is associated with maternal undernutrition.(24, 25) Furthermore, undernutrition includes a number of essential micronutrient deficiencies, and most commonly in South Africa Vitamin A, and iron and zinc deficiencies.(5, 8, 26)

According to the National Food Consumption-Fortification Baseline (NFCS) survey conducted in South Africa in 2005, the national prevalence of undernutrition, as described by stunting, underweight and wasting, in children between one to nine years was 18%, 9% and nearly 5% respectively. Stunting prevalence varied between and within provinces in the country, with higher prevalence in rural parts of the country. Compared to other middle-income countries, the South African prevalence of stunting in young children is concerning. The South African levels of stunting are comparable to lower income countries in the region and are sometimes higher than poorer countries in other regions.(12)

South Africa needs to implement evidence-based strategies to deal with undernutrition in children. The framework for the strategies exists. However, challenges are often experienced in the coverage, intensity and quality of service provision.(12) A key priority strategy is growth monitoring and promotion (GMP), a framework comprising child growth monitoring and growth promotion interventions, such as counselling on infant and young child feeding to prevent undernutrition.(27) The aim of the GMP strategy is in line with, and is supportive of, the Health Negotiated Service Delivery Agreement to decrease child mortality.(12)

This literature review will look at growth monitoring and promotion at primary care settings as part of the strategies prioritized for reducing childhood undernutrition in South Africa.

Relevant Department of Health policies, guidelines or strategies on nutrition or child health were included in the literature review. Recent South African Journal of Clinical Nutrition articles were hand searched for topics on growth monitoring and promotion in children. The reference lists of relevant articles were followed up for further sources. Databases including PUBMED, Google Scholar and UKZN library search catalogue (iLINK) we utilised to search for published national and international information. Key words used in the search included “child”, “growth monitoring”, “growth monitoring and promotion”. Articles where the nutritional status assessment studies were not based on the GMP concept were excluded. Limiters applied included: English language literature published between the years 2000 to 2014. Sixty-eight relevant papers were identified through this process.

2.2 OVERVIEW OF THE NUTRITIONAL STATUS OF YOUNG CHILDREN IN SOUTH AFRICA

In the first South African National Health and Nutrition Examination Survey (SANHANES-1) results reported in 2013, (26) the national prevalence of stunting, underweight and wasting was 22%, 5% and 3% respectively in children under five years old. The prevalence of stunting was highest in children aged three years and younger. The findings of the survey revealed that stunting, indicative of chronic malnutrition, was more prevalent than acute malnutrition in South Africa (see Table 2-1). Boys aged three years and younger were more affected by stunting, with 23% boys in rural informal areas stunted compared to 14% in urban formal areas. According to global standards, the national prevalence of stunting in the country is classified as of medium severity and as for wasting and underweight low severity. The survey also reported provincial differences in prevalence of stunting, with the highest prevalence levels reported in North West, Mpumalanga and Northern Cape. The lowest prevalence was reported in the Gauteng Province. The inter provincial differences in stunting prevalence may be attributable to the living standards and the poverty levels in these provinces, as one of the accepted reasons for chronic undernutrition is poverty.(20, 28) In the Eastern Cape 22% boys and 16%, girls younger than fifteen years were stunted, and 4% boys and 4% girls of these were severely stunted. It is recognised that the socio-economic determinants of undernutrition play a substantial role in maternal and child undernutrition, and South Africa has a persistent challenge of food insecurity at household level, resulting from poverty and inequitable distribution of resources.(12, 20, 24)

The SANHANES-1 also showed that the proportion of overweight preschool children had increased from 11% to 18% and that obesity levels remained unchanged, when compared to the NFCS data.(26) Kirsten *et al*, (29) the SANHANES-1 and other international studies have documented a disturbing trend of increasing childhood overweight and obesity in children in developing countries.(26, 29, 30)

Table 2.1: Nutrition indicators from the SANHANES 1

Nutritional status indicator	National prevalence (%) in children aged 3 years and younger	Eastern Cape prevalence (%) in children younger than 15 years
Severe stunting	Boys: 9.9% Girls: 9.1%	Boys: 4.0% Girls: 4.0%
Stunting	Boys: 26.9% Girls: 25.9%	Boys: 21.6% Girls: 15.6%
Underweight	Boys: 8.2% Girls: 3.6%	Boys: 1.9% Girls: 3.2%
Wasting	Boys: 3.8% Girls: 1.5%	Boys: 1.6% Girls: 5.6%

On further comparison of the NFCS of 2005 and the SANHANES-1 of 2013 survey data, it was noted that the national prevalence of underweight and wasting in young children was decreasing. However a 12% increase in stunting prevalence in children one to three years old was reported.(26)

The dual problems of chronic undernutrition and over nutrition (overweight and obesity) in South African children need to be addressed with evidence based public health policies and interventions.

2.3 STRATEGIES TO ADDRESS CHILD UNDERNUTRITION IN SOUTH AFRICA

Against the background of prevalent chronic child undernutrition in the country and the international pressure to reach the Millennium Development Goals (MDGs) by the end of 2015, there has been greater commitment and awareness of the need to utilize resources efficiently, by implementing evidence based interventions for addressing child undernutrition.(5, 12-14) The National Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012-2016 summarises the interventions and strategies which the country's health sector has prioritized to target child health. These include: promotion of exclusive breastfeeding and appropriate complementary feeding practices; preventative services such as immunisation, growth monitoring and promotion, Vitamin A supplementation, and regular deworming; and curative services which include managing common childhood illnesses using the IMCI approach.(5, 9)

The Roadmap for Nutrition in South Africa 2013-2017, (12) is a strategy document that outlines the need to refocus the country's Integrated Nutrition Programme (INP) on effective interventions to improve maternal and child nutritional status and to target these interventions in the first 1000 days (from gestation to twenty four months of life). The nutrition strategy emphasises integration of key nutrition interventions into existing healthcare programmes, such as Basic Antenatal Care, Prevention of Mother-to-Child Transmission, and IMCI. It also advocates for the strengthening of nutrition interventions within the PHC approach. The strategy emphasises the need to scale up community level nutrition programmes and on improving the quality and effectiveness of interventions, including GMP.(12)

2.4 DEFINITION OF GROWTH MONITORING AND PROMOTION AND ITS ROLE IN REDUCING CHILD UNDERNUTRITION

Growth monitoring and promotion is an intervention that has always been a part of nutrition interventions available in the South African INP. However, generally, GMP has not been implemented optimally, leading to missed opportunities due to failure to detect early growth faltering; growth monitoring not linked to counselling on infant and young child feeding; and a weak growth promotion component.(3, 11, 12) The poor outcomes associated with GMP programmes have led to questions of GMP effectiveness.(31)
In 2011 South Africa launched the new RTHB based on the WHO growth standards; the nutrition strategy aims to use the introduction of the new RTHB as an opportunity to strengthen GMP and to improve its effectiveness.(12) This considering that it had been reported that the previous RTHC was not effectively used in GMP.(32) Therefore, it is important to understand the history and evidence of GMP effectiveness in improving children's nutritional status and heath.

In a report of the technical consultation on growth monitoring and promotion by UNICEF, it was highlighted that one of the reasons for the effectiveness of GMP being questioned is a lack of understanding of the difference between the activity of 'growth monitoring' and the concept of 'growth monitoring and promotion'.(3) 'Growth monitoring' is defined mainly by the activity of measuring and following a child's growth rate and comparing this to a growth standard. The objective of this activity is to assess the adequacy of growth, detect early growth faltering, and promote healthy growth to prevent deterioration to undernutrition. 'Growth monitoring and promotion' goes beyond monitoring, by including interventions to not only to prevent undernutrition, but promote child growth. As such, the interventions focus on caregiver interaction and communication to promote child growth. GMP objectives

include increasing caregivers' awareness about their child's growth, improving caring practices and having a positive impact on care seeking behaviour as an entry to other child health interventions.(3)

2.4.1 Growth monitoring indices

In a survey of growth monitoring practices in various countries, De Onis *et al,* (33) reported that the weight for age index was used universally to monitor children's growth, and for over half of the 178 countries surveyed it was the only index used. African countries were less likely to utilise length/height based indices to monitor child growth. Length/height indices include the length/height-for-age and weight for length/height anthropometric indices. The length/height based indices are widely used in Europe and North America. Several authors have emphasized the need to monitor length or height growth in children, but often developing countries with higher prevalence of stunting do not monitor length routinely in child growth assessment. Victora *et al,* (4) reported that pronounced growth faltering in infants started early, including length/height for age faltering, emphasizing the need for monitoring length or height in the growth monitoring practices for infants and young children.(5, 24, 34)

The disadvantage of not using length or height in monitoring children's growth is that healthcare workers will not be able to detect stunted, wasted and overweight children and therefore will not be able to target these children with appropriate interventions.(34) The weight for age index is also not specific enough to differentiate whether low weight for age is caused by a low weight or by stunting.(34) Failure to detect severe wasting can compromise the diagnosis for severe acute malnutrition, as the criteria for diagnosis now exclude the weight for age index.(23, 34, 35) On a policy level, the implications of not using length in child growth assessment can impact on prioritisation of interventions and can lead to poor targeting of resources towards reducing stunting in children. Reducing stunting has long term benefits towards realizing child growth potential and carries development benefits for countries.(25) South Africa has moderate severity levels of childhood stunting, thus inclusion of length-based indices in child growth monitoring has particular significance for this country. There is emerging evidence that beyond post infancy stunting, at risk children may continue to growth falter and stunted children, if identified and targeted with appropriate interventions, may have a possibility of catch up growth up to early school age.(36) This highlights the need for regular length monitoring in young children, with concomitant appropriate interventions.

It is acknowledged that plotting the additional measurement of length and interpretation of the additional indices by health workers will pose a number of challenges in terms of equipment, time, staffing and training of health personnel.(18, 21, 24, 33). Limited resources in low and middle income countries have to be considered in decisions about which indices to use for GMP and the frequency of monitoring.(37) The indices used in GMP monitoring need to accommodate caregivers' and health workers' views on adequate growth assessment, as discordant views in this regard can lead to poor attendance and poor quality of GMP.(38, 39) According to Tchibindat *et al,* (38) mothers use other descriptions of their child's growth or development beyond anthropometric measures and these views need to be utilised in the conceptualisation of indices for measuring growth and development.

2.4.2 Recommended approach for appropriate growth monitoring and promotion

Appropriate GMP is based on the "triple A" cycle of assessment, analysis and action (Figure 2.1). For growth monitoring to be optimised, GMP needs to reach all children from birth to

24 months and needs to include a community component, with defined links and referral pathways to PHC facilities. The ideal setting for GMP is in the community, but it is possible to implement GMP also in PHC facilities.(3)

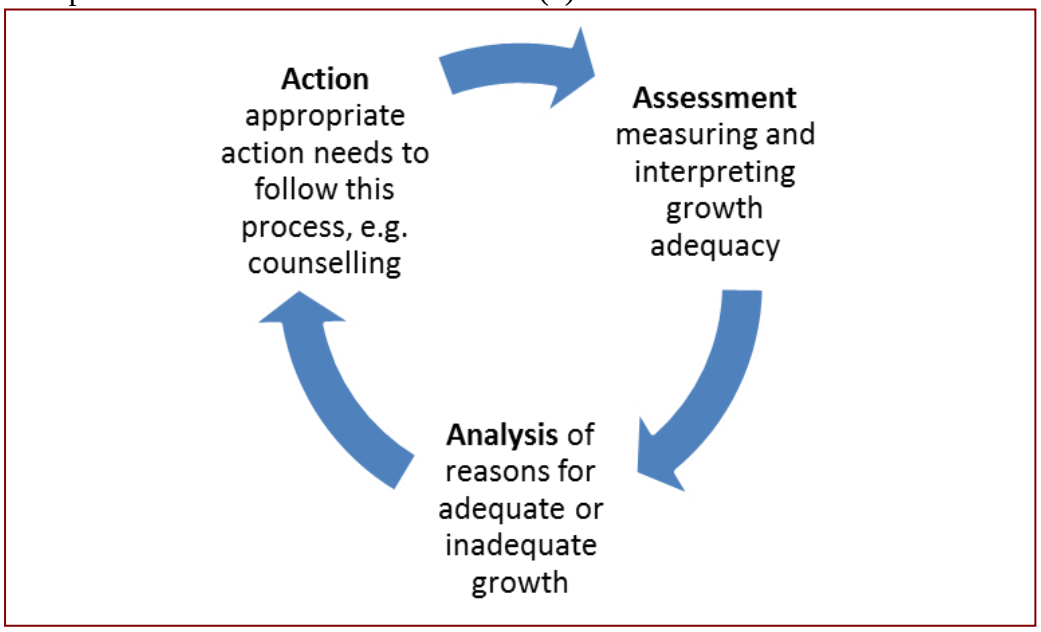

Figure 2.1: The "triple A" cycle of growth monitoring and promotion(3)

GMP includes regular periodic monitoring and follow-up of growth of the child and cannot be done at irregular intervals, as it advocates for early detection of growth faltering and growth promotional counselling and education. Figure 2.2 describes a framework of how these actions can possibly have an impact on child health and survival.(3) According to UNICEF use of the weight for age index is the preferred indicator for GMP as it is thought to be the most sensitive to detect early growth faltering, and thus the GMP concept uses weight based growth indices despite the limitations of excluding length or height based indices as discussed previously.(3, 40)

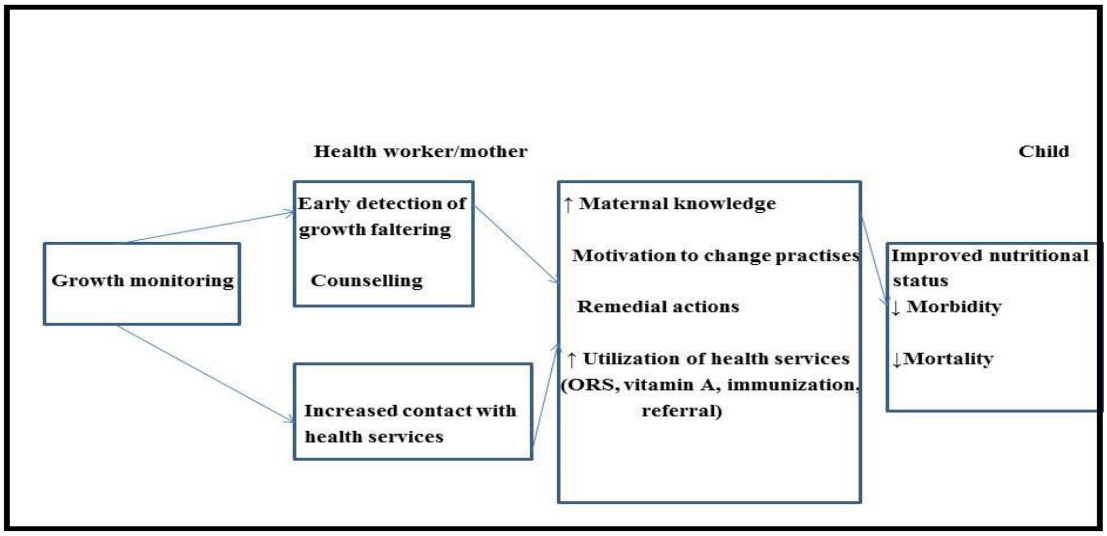

Figure 2.2 GMP framework[3]

In the review of the effectiveness of GMP in preventing child undernutrition by Griffiths *et al*, (41) the GMP process is described using Figure 2.3. The process diagram also depicts the difference between growth monitoring and the additional activities that promote growth in GMP. It breaks down the approach to GMP and clarifies what activities need to be done to ensure appropriate GMP.

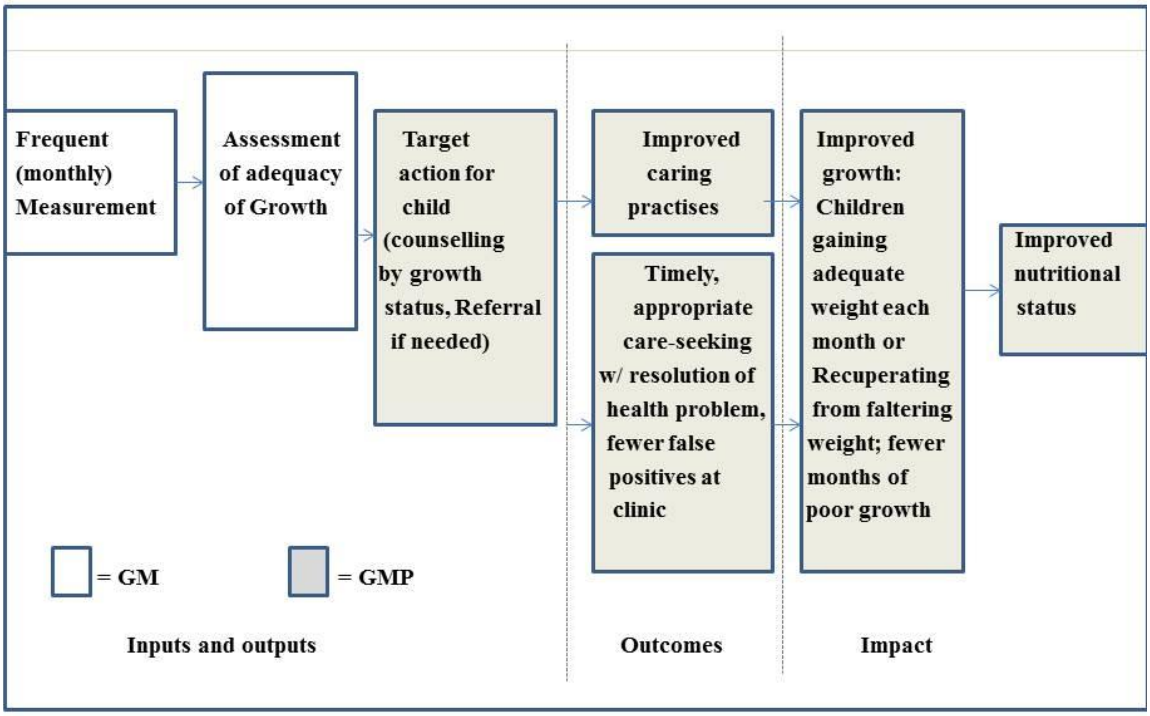

Figure 2.3 GMP process[41]

2.4.3 Evidence of GMP effectiveness

Evidence of GMP effectiveness is needed to justify the investment in time and related costs, both for caregivers and healthcare workers.(31) Evidence available thus far regarding effectiveness in reducing child undernutrition has been conflicting. A review by Bhutta *et al*, (42) of evidence based interventions that countries can adopt to reduce child undernutrition concluded that there was insufficient evidence to recommend the implementation of growth monitoring as an effective, stand-alone intervention. The authors emphasized the essential role of nutrition counselling and appropriate referral, when indicated, for ensuring the effectiveness of this strategy. Nutrition counselling is an essential component of the GMP strategy, and there is evidence of its effectiveness in improving children's nutritional status.(8, 12, 40) In a UNICEF commissioned review of GMP programmes, (41) the researchers reported that there was evidence that programs which included quality GMP had a positive impact on children's nutritional status. Griffiths *et al*, (41) concluded that GMP should not be abandoned as part of the comprehensive package of child health, but improvements need to focus on how to incorporate the evidence acquired thus far in the process.(41) Jonker and Stellenberg (43) reported on the experiences of primary care services of caregivers of young children attending three Cape Metropole clinics in South Africa. It was reported that services were not comprehensive, including GMP services using the RTHB,

and nutrition counselling was inadequate. The caregivers also attended private care for child health services, and the private service providers also did not adhere to GMP guidelines.(43)

Conceptual confusion and incomplete implementation of GMP has led to difficulty in establishing the effectiveness of GMP from the current evidence. The predefined GMP elements are often not implemented consistently across programmes.(11, 31) Garner *et al,* (31) recommended that the GMP process needs to be well defined to avoid doing more harm than good and further evidence of the effectiveness of GMP was needed. Ashworth *et al,* (11) highlighted the difficulty of separating the impact of growth monitoring from other activities undertaken during growth monitoring when attempting to determine effectiveness of GMP. Rigorous trials are needed to investigate the effect of GMP, not just GM as a stand-alone intervention.

Ashworth *et al,* (11) suggested that there was a place for growth monitoring within programmes that also implemented quality nutrition counselling and other comprehensive child health interventions. Ashworth *et al,* (11) stated that the argument for monitoring the growth of children was plausible and that promotional activities associated with growth monitoring have been shown to have an impact on children's nutritional status. In GMP programmes that failed to show impact, weaknesses highlighted were often in the promotional components of GMP, including nutrition counselling.(11)

2.5 GMP IMPLEMENTATION CHALLENGES

Challenges in GMP implementation reported in literature include difficulties with interpreting the growth curve of the child and being able to determine if a child is "at risk". Technical problems have also been reported, including plotting accuracy, shortage of growth charts and equipment issues. In the De Onis *et al* report, (33) in the countries reviewed , nutrition counselling and appropriate referrals were identified as GMP strategies to address growth faltering, but countries reported barriers to implementing these interventions. Barriers included time constraints, staff shortages, inadequate training and lack of motivation.(35) In South Africa, Tarwa and De Villiers (32) reported problems with: plotting on the RTHC; targeting at risk children with appropriate interventions; and healthcare workers not asking for the chart at other consultations, besides at well baby clinic visits. When healthcare workers did not ask for the RTHC at each visit, caregivers reported that this led to them not bringing the cards for consultations at subsequent healthcare facility visits.(32)
Staff and caregivers perceptions and attitudes of GMP present challenges to GMP implementation. Healthcare workers often prioritize curative interventions and the technical aspects of GMP.(44) The misunderstanding of the GMP concept by implementers plays a role in poor GMP practices.(45) Sanders and Chopra (46) reported that health workers at clinics in the Mount Frere district in the Eastern Cape, South Africa, attributed a heavy workload for the rendering of poor quality GMP. Furthermore, Sanders and Chopra identified several misconceptions amongst health workers about the objectives of GMP. They further noted that healthcare workers ignored opportunities for dialogue with caregivers and most of the caregivers reported that they were not even greeted by the health worker prior to GMP.(46) Caregivers' perceptions have been shown to reflect the perception that attending for vaccination services was more important and when these were completed there was no longer any need to come for regular growth monitoring and growth promotion activities. (38) Other studies, (38, 39, 47, 48) have reported that caregivers are interested in their children's growth and development and are willing to participate in GMP. Some caregiver attending GMP visits have however cited staff attitudes as deterrents for attending GMP visits.(38, 39, 47). In a study in Duncan village, East London, South Africa, mothers reported verbal abuse by

healthcare workers and dissatisfaction with clinic services as reasons for not attending primary care services for their children.(49) Caregivers' socio-economic status impacts on their ability to implement health advice given at GMP sessions and this can demotivate and affect GMP attendance.(22, 39)

Infrastructure, human resource and equipment constraints contribute to further gaps in GMP implementation.(22, 45, 48) Charlton *et al* (48) reported that caregivers were concerned about the lack of privacy for GMP consultations and felt that the generalized group education did not address individual caregiver concerns or needs. The lack of counselling space and overcrowding in clinics resulted in poor GMP counselling and lack of targeted education for individual children based on their growth status and the individual factors contributing to a particular growth status.(27)

Human resource constraints and inadequate staff training lead to sub-optimal healthcare workers' knowledge; compromised ability to detect children at risk of undernutrition; not enough skills to use the RTHC or RTHB; including, nutrition counselling skills.(21, 22, 45, 47) Roberfroid *et al,* (44) highlighted the role of pre-service training in developing appropriate health worker attitudes to preventative services and acquiring essential counselling skills. Schoeman and Hattingh (50) reported that nurses' knowledge of appropriate follow up schedules for GMP was poor, posing a risk to GMP effectiveness at selected Northern Cape primary healthcare facilities. Community based GMP services utilising community volunteers had additional challenges with high staff turnover and low literacy of volunteers. The staff turnover and literacy of the volunteers impacted on the quality of the GMP service although most of the volunteers were trained in GMP.(47)

The setting for the GMP community sites needs to be considered carefully as the setting of the GMP services can impair delivery of appropriate GMP. Sites such as crèches lack caregiver involvement and thus are not ideal. Community based sites are ideal for improving coverage and increasing access to GMP as a preventative service.(47) GM alone without caregiver counselling negates the concept of GMP.(3, 40, 47)

2.6 SUMMARY

Chronic childhood undernutrition in South Africa is still a major public health concern. Further, there is an increasing trend of overweight in young children. Evidence discussed in this chapter suggests that quality GMP implemented as part of child health programs can impact positively on reducing child undernutrition and detecting children at risk of overweight and obesity. Gaps in GMP implementation can pose challenges to the effectiveness of GMP.

CHAPTER III: METHODS

3.1INTRODUCTION

The study was designed as a cross sectional descriptive study, to describe growth monitoring and promotion activities at PHC facilities in Grahamstown, in the Makana Sub-District of the Cacadu (Sarah Baartman) District in the Eastern Cape South Africa. The study was implemented in the seven Department of Health fixed clinics in Grahamstown. This chapter will look at the methods that were used for implementing the study, in terms of sample selection, data sources, data generation, data handling, and approach to data analysis. Possible bias and limitations of the study are also presented.

3.2 TYPE OF RESEARCH

A health systems research was implemented, describing growth monitoring and promotion activities as implemented in fixed clinics in Grahamstown, in the Makana Sub-District of the Cacadu (Sarah Baartman) District in the Eastern Cape South Africa.

3.3 STUDY SETTING

The study was based in the Grahamstown area of the Makana Sub-District in the Cacadu (Sarah Baartman) District. The Cacadu district (Sarah Baartman) had an increase in the incidence of severe malnutrition from 4.1% in 2009/10 to 8.3% in 2012/13.(19)

The Grahamstown area has seven fixed PHC facilities, two in urban and five in peri-urban areas that were all included in the study. Only the fixed PHC facilities offer GMP services, as the operations at the satellite sites are not functional.

All clinics had CHWs and professional nurses and only two of the clinics, Middle Terrace clinic and Raglan Road clinic, had a health educator.
Grahamstown PHC facilities' staff received training in GMP and IMCI. According to training records, 34/38 (90.0%) professional nurses from the seven clinics in the Makana Sub-District had been IMCI trained. Training on the updated GMP guidelines and the use of the new RTHB was conducted in March 2011 and use of the RTHB commenced in April 2011. The training on the new RTHB included professional nurses, health educators, home based carers and CHWs. Other categories of nursing personnel, e.g. enrolled nurses and nursing assistants, are not routinely involved in GMP in clinics in Makana Sub-District and were thus not specifically targeted for GMP training. It was reported that CHWs and professional nurses usually conduct GMP services at these PHC facilities.

3.4 STUDY DESIGN

This study used a cross-sectional descriptive study design.

3.5 TARGET AND STUDY POPULATION

The target population was all children aged 0-24 months of age and their caregivers attending clinics in urban and peri-urban areas of Grahamstown, Makana Sub-district, in the Cacadu (Sarah Baartman) district of the Eastern Cape, South Africa. Due to the Department of Health's priority to target the first 1000 days (maternal and early childhood health) in the Roadmap for Nutrition in South Africa 2013-2017 strategy, the age group of 0-24 months was the focus of this study.(12) The study (accessible) population comprised children 0-24 months of age and their caregivers, attending clinics in Grahamstown, from November 2012 to January 2014.

3.6 SAMPLING STRATEGY, SIZE AND RECRUITMENT

Grahamstown area of the Makana Sub-district was conveniently sampled as the researcher was based there. Within Grahamstown, seven sites were included in the study. Within the selected clinics, on the day of the survey, non-probability consecutive sampling of eligible children and their caregivers was undertaken. Eligible children included those aged between 0-24 months who had been seen by a healthcare worker for postnatal visits, well-baby clinic, sick visits and GMP. Children attending for measles immunisation campaign, collecting blood results or emergency cases were excluded. Children who did not have a RTHB on the day of the survey were also excluded. Once eligibility to participate was established, the caregiver of the child was asked to give consent to participate in the study.

To calculate the sample size requirements for children: the three months under-five headcount (9000) for these facilities was obtained from the District Health Information System, and assuming a 55% prevalence of appropriate GMP at a precision of 7% on either side of 55%, and a 95% confidence interval, the required sample size was initially calculated to be one hundred and ninety RTHBs and caregivers. The formula used for sample size calculation for this sample size was:
Sample size = n/(1-(n/population)), n= Z*Z (P (1-P))/ (D*D) .
The sample size estimation did not account for cluster correlation design effects. The design effect would be a significant consideration if the study would be doing two group comparisons for identification of predictors or determinants for appropriate GMP. The assumption of 55% prevalence of appropriate GMP was based partly on the observations by the researcher through her experience in working at the clinics to be sampled, as there was no previous data available to obtain the proportion for this variable. The biostatistician also advised on this estimation based on the assumption that if the proportion is not known and will be estimated, using 50% is the best approach as it yields maximum sample size. After preliminary findings were analysed when a total of one hundred and sixteen observations were reached, the proportion of children receiving appropriate GMP was estimated to be at 26%. The researcher and supervisor with guidance from the biostatistician decided on a convenience sample size recalculated at one hundred and fifty-seven (157) proportionally distributed across the 7 facilities with the revised assumptions of prevalence= 0.35 (accepted CI width of 0.15). This was decided based on the understanding that the study design was purely descriptive without any comparisons in the primary aims, thus less precision and not accounting for design effect would be accepted as a study limitation.

Recruitment into the study occurred on different days and times within the overall study period as the children and caregivers were consecutively sampled as they presented to the facilities. The researcher and her assistant would arrive at the relevant facility on the day of data collection, notify the sister in charge of their presence, and would then arrange a private room inside the clinic to conduct the RTHB audits and interviews. Most of the visits were scheduled in the morning, as most caregivers and their children were encouraged by the clinic staff to present in the mornings for their GMP and well-baby clinic visits; the researcher and her assistant went at a time that was convenient for them. Eligible children were identified (with the assistance of the clinic staff) and after they completed their clinic consultation were approached to participate in the study. The interviews were all conducted after consultation. The children and their caregivers were approached and sampled as they presented to the clinic, until the predetermined number per facility was reached. The GMP practices were evaluated based on an audit of the recordings in the RTHB for the current visit. Previous visit records were not included unless used to determine eligibility for further intervention at the

current visit. The caregivers of all eligible children were interviewed verbally and their responses recorded on the questionnaire through an interviewer administered questionnaire. Selected children were entered alphabetically by surname into the study register. The study register was checked to avoid duplicate enrolment. The study register was only available to the investigator and her research assistant.
One hundred and sixty four children and their caregivers were recruited by the end of the survey.

3.7VARIABLES

Table 3.1 lists the variables assessed in this study, this table also gives the indicators which were used to define appropriate GMP. Appropriate GMP in this study was described using the weight-for-age index since length-based growth indices had been recently introduced in child growth monitoring, and were for periodic assessment, i.e. at six monthly intervals, while weight-for-age index was used for monthly plotting for routine GMP.(4)
Appropriate GMP was defined as correct use of weight-for-age index, growth interpreted correctly and discussed with caregiver, interventions promoted or given as indicated and follow-up scheduled as per IMCI or GMP protocol, i.e. criteria in Table 3.1, all six indicators for appropriate GMP. The principal investigator's clinical experience of GMP in the clinics in the area was that weight-for-age was more widely used compared to length-based indices.

Table 3.1: List of variables

Objective	**Variables**	**Indicators**	**Sample unit**	**Type of variable and coding**
Proportion of children receiving appropriate GMP	Percentage received appropriate GMP† (Summarised across the study population and derived from the indicators)	Weight recorded	RTHB	Categorical with dichotomous yes/no response
		Weight plotted (weight-for-age) plotted monthly		
		Comments on growth recorded/reported by caregiver		
		Scheduled follow up recorded/reported by caregiver		
		Intervention recorded where there is evidence of growth faltering/ undernutrition		
		Appropriate referral where needed recorded		
Caregivers experience and perceptions of growth monitoring	Experience Perceptions	Perception on adequacy of information given after growth monitoring	Caregiver Interviews	Categorical with dichotomous, nominal and ordinal responses
		Engagement in interpretation of child's growth		

Objective	Variables	Indicators	Sample unit	Type of variable and coding
and promotion		Nutritional advice given following growth monitoring		
		Information given about follow-up		

†GMP: correct use of weight-for-age index, growth interpreted correctly and discussed with caregiver, interventions promoted or given as indicated and follow-up scheduled as per IMCI or GMP protocol

3.8 DATA SOURCES

The data for this study was extracted from the RTHB of the children and generated from caregiver interviews. A RTHB audit checklist and interviewer-administered questionnaire were designed by the principal investigator using Department of Health policy documents for child growth assessment as the reference documents for good practice, i.e. RTHB guidelines for health workers and the IMCI chart booklet 2011.(4, 15). Criteria for counselling, follow-up and supplementation are included in the checklist, see Appendix 1. The criteria on the RTHB checklist and the caregiver questionnaire were piloted in the paediatric ward of the local hospital and the opportunity was used to train one research assistant. The participant information sheet was translated into *isi*-Xhosa; the translated participant information sheet was also piloted at these sessions. The RTHB checklist and caregiver questionnaire are included in Appendix 1 and Appendix 2. The researcher and her assistant used the RTHB audit checklist to audit the entire RTHB of the child. Each criterion on the audit checklist was marked as recorded, not recorded, and if recorded as correctly recorded and interpreted, or not applicable. The researcher and assistant also made comments where applicable. Where a criterion on the RTHB needed an interpretation or an action by the health worker, the researcher or her assistant would check if the documented interpretation or action recorded by the health worker was in line with the Department of Health policies and guidelines mentioned above.

3.8.1 Data collection

Data was extracted using paper based RTHB audit checklists and caregiver questionnaires from November 2012 to January 2014 by the principal investigator and initially one assistant. The assistant was monitored by the principal investigator for quality control and worked independently after her skills were verified. A total of thirty three visits were made to the sites (see table 3.1 for the number of visits per site), and the average number of interviews and RTHB audited per visit is presented in table 3.1; depending on the number of eligible children and their caregivers who were available and gave consent to participate in the study. Data collection was done over a period of fifteen months, as the principal investigator was constrained by personal and work circumstances thus had limited time for data collection.

Table 3.2 Number of visits per facility

	Number of visits per facility	Average number of interviews per visit
Anglo-African clinic	3	4
Joza clinic	4	6.3
Middle terrace clinic	7	3.7
N.G. Dlukulu	2	12.5
Raglan Road clinic	7	4.4
Settlers day hospital	7	3.1
Tantyi clinic	3	7.3
Total	**33**	**8.9**

3.8.2 Data capturing and processing

Completed checklists and questionnaires were checked by the principal investigator before data was captured in Microsoft Excel. RTHB checklists and questionnaires that had missing data were included in the study; the data elements that were available were captured and the missing data was coded as "missing" and excluded in the analysis for that variable. The data captured in Microsoft Excel was transferred to SPSS for processing and analysis. Descriptive analysis was then performed.

3.9 DATA ANALYSIS

The categorical data were reported as frequency counts and percentages and Chi^2 tests were used to analyse and compare the data across sampled facilities. Statistical significance of the data was determined (p value <0.05). Cramer's V statistic was used to check the strength of the significance.

The findings were also reported as tables per facility to compare the results and to explore the reasons behind the observed differences. Results of appropriate GMP were cross-tabulated among clinics using Chi^2 test. This analysis was tested for trend using Pearson or Fishers' exact test, at $p<0.05$ level of significance. The remaining data was summarized into frequency counts and percentages; these analyses are presented in frequency distribution tables and graphs.

3.10 RELIABILITY AND VALIDITY OF DATA SOURCES

Measures were undertaken to ensure validity and reliability of data collected during the study.

3.10.1 Internal validity

To ensure internal validity of the data an attempt was made to reduce information bias. The tools were developed by the principal investigator, with input from the INP manager and her research assistant who works as a community liaison officer for the INP in the sub-district. The study also used anonymous questionnaires and checklist, thus limiting information bias.

The pilot study was used to train the research assistant to improve reliability. The principal investigator was able to closely supervise the research assistant to minimise misreporting. All the completed checklists and questionnaires were checked after the interviews by the principal investigator, captured by her on excel to minimise missing data and errors. The assistant was available to assist for the first seven interviews in the study, but after three sessions she was unavailable thus most interviews were conducted by the principal investigator.

3.10.2 External validity

A representative sample size of children from birth to twenty-four months was determined for all the Grahamstown fixed clinics based on the PHC under-five headcount and expected proportion for appropriate GMP, see section 3.6. The number sampled from each clinic was proportional to the headcount of the clinic.

3.11 APPROVALS AND PERMISSIONS

Relevant approvals were obtained before the study was piloted and carried out.

3.11.1 Approvals

The study was registered with University of KwaZulu-Natal (UKZN) Postgraduate and Research Committee for degree purposes (See Appendix 3). Amendments to sample size were approved by this body.

Ethical approval for the study was obtained from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal (reference number BE190/11; see Appendix 4). Changes from the initial larger sample size and study sites which included sites outside Grahamstown were submitted to BREC and were approved (see Appendices 3 and 4).

3.11.2 Permissions

Permission to conduct the survey was sought from the Epidemiology Research and Surveillance Department of the Eastern Cape Department of Health. Permission to conduct the study was further obtained from the Makana Sub-District Manager (Appendix 5).

3.11.3 Informed consent and confidentiality

Potential participants received an explanation of the study and informed consent was sought. Written informed consent was obtained from the caregivers (see Appendix 6). Caregivers who were illiterate had the participant information sheet read and explained to them in the presence of a witness, the witness confirmed the information, their consent was sought and they were able to sign their initials on the consent form and the witness's signature was also obtained. Consent forms from all the participants were kept confidential and only the principal investigator and her assistant had access to this data. In the case where the interviewers identified a missed opportunity for an intervention, a referral back was written in that child's RTHB and when the caregivers had a query that involved further services offered at the clinic, they were advised verbally to seek appropriate help at the clinic for assistance.

CHAPTER IV: RESULTS

4.1 STUDY SITES AND PARTICIPANT CHARACTERISTICS

All seven Department of Health fixed clinics in Grahamstown were included in the study. From the clinics, 164 RTHBs and caregivers of children aged up to 24 months were sampled according to probability proportional to size, utilising the under-five headcount, implementing non-probability consecutive sampling. Data was collected from November 2012 to January 2014. One hundred and sixty-seven eligible caregivers were approached. Three declined to be interviewed, resulting in a response rate of 98%.
The number of children recruited from each facility is displayed in Table 4.1, compared to the total headcount for children aged less than five years at the study sites for the period April 2012 to March 2013.

Table 4.1: Children sampled by clinic compared to under five headcount from November 2012 to January 2014 at Grahamstown clinics (N=164)

	Under-five children Headcount n (% of total head count)	**Number sampled per clinic n (% of total sample size)**
Anglo-African clinic	1120 (4.3)	12 (7.3)
Joza clinic	4431 (17.2)	25 (15.2)
Middle terrace clinic	4029 (15.6)	26 (15.9)
N.G. Dlukulu	3672 (14.3)	25 (15.2)
Raglan Road clinic	5287 (20.5)	31 (18.9)
Settlers day hospital	3777 (14.7)	23 (14.2)
Tantyi clinic	3458 (13.4)	22 (13.4)
Total	**25774**	**164**

The RTHB booklet audit tool and caregiver questionnaires were used to collect data on GMP practices. Results for the RTHB audit, caregivers' questionnaire and overall GMP process are reported below.

4.2 RESULTS FROM THE RTHB AUDIT

Results detailed in this section were obtained from the audit of the entries on the children's RTHB, utilising a checklist. The RTHB was reviewed at the clinic on the day of data collection, after the child and caregiver had completed their PHC visit.

The median for age of the children was 7 months (IQR 3-12 months). See Table 4.2.

Table 4.2: Ages of children sampled from November 2012 to January 2014 at seven clinics in Grahamstown (N=164)

Categories of children's ages	**Count (n)**	**Percentage (%)**
0-6 months	80	48.8
7-12 months	47	28.7
> 12 months	37	22.6
Total	**164**	**100.0**

The RTHBs of most children (89.0%) had a record of the weight of the child for the current clinic visit. For the children for whom graphic plotting of weight for age was indicated, the weight was plotted in 78.0% of RTHBs audited. Table 4.3 gives details of the results of all

the growth indices audited and the various dimensions recorded in the RTHBs. Results are reported with the 95% confidence interval (CI) which gives a range of values that indicate the possible study population values. Although the total sample was 164 RTHBs, the eligibility criteria for each indicator determined the total per indicator; this eligibility was based on the Department of Health guidelines for GMP and IMCI, as indicated by the different N values in Table 4.3.

Table 4:3 Results of the RTHB audits from November 2012 to January 2014 in Grahamstown clinics

Indicators	Dimensions	N eligible	n	%	95% CI
Weight based indices	Recorded weight	163	145	89.0	(84.1; 93.8)
	Plotted weight for age	150	117	78.0	(71.4; 84.6)
	Comments on growth	163	37	22.7	(16.3; 29.1)
Length based indices	Recorded length	94	17	18.1	(10.3; 22.5)
	Plotted length for age	90	9	10.0	(3.8; 16.2)
	Plotted length for weight	93	2	2.2	(0*; 5.2)
Interventions	Vitamin A supplementation	40	35	87.5	(77.3; 97.7)
	Nutrition counselling	157	13	8.3	(4.0; 12.6)
	Scheduled follow up	161	116	71.0	(65.1; 79.0)
	Nutrition supplementation	8	2	25.0	(0*; 55.0)

* All negative values changed to zero.

The RTHBs of 18.1% of the children had a recorded length in the past six months; 10.0% had a plotted length for age and 2.2% weight for length. Eligibility for length measurement was based on the RTHB guideline which calls for a six-monthly length measurement.(4)

One child was eligible for referral according to the GMP criteria; this referral was recorded in the child's RTHB. Interventions associated with GMP including Vitamin A, nutrition counselling, scheduled follow-up and supplementation are also reported in Table 4.3.

4.3 RESULTS OF THE CAREGIVERS' QUESTIONNAIRE

The median age of the caregivers was 27 years (IQR 22.0-33.5 years). Among caregivers 84.6% were biological mothers to the children, 28.2% had completed Grade 12 or an equivalent and 4.3% had a higher education qualification (see Table 4.4).

Table 4:4 Characteristics of the caregivers sampled from November 2012 to January 2014 at seven clinics in Grahamstown

Characteristics of caregivers		n	%	95% CI
Age	≤18 years	8	5.1	(1.7; 8.5)
N=157	19-25 years	57	36.3	(28.8; 43.8)
	26-30 years	37	23.6	(17.0; 30.2)
	31-40 years	36	22.9	(16.3; 29.5)
	41-50 years	10	6.4	(2.6; 10.2)
	≥51years	9	5.7	(2.1; 9.3)
Relationship	Parent	133	85.3	(79.7; 90.9)
to the child	Aunt	5	3.2	(0.4; 6.0)

Characteristics of caregivers		n	%	95% CI
N=156	Grandmother/great grandmother	11	7.1	(3.1; 11.1)
	Nanny	6	3.9	(0.9; 6.9)
	Sister	1	0.6	(0*; 1.8)
Educational status N=163	< Grade 12	110	67.5	(60.3; 74.7)
	Grade 12 or equivalent	46	28.2	(21.3; 35.1)
	Diploma, degree or higher	7	4.3	(1.2; 7.4)

*****Negative value changed to zero.

One hundred and fifty one caregivers (92.1%) reported that their children were weighed and 80.0% reported that this was often by a CHW (see Figure 4.1).

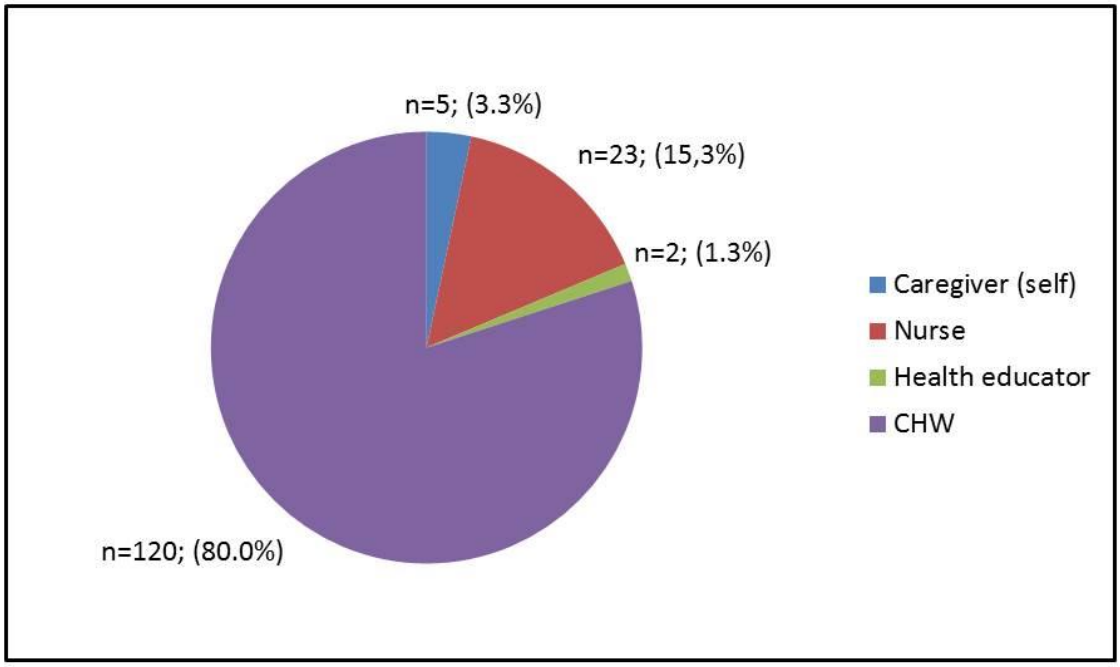

Figure 4.1: Caregivers response of category of healthcare worker who weighed their children (N=150)

Table 4.5 gives a summary of the caregivers' report on the feedback received on their child's growth during their clinic visit. This feedback was either given by the healthcare worker who weighed the child or later on during their clinic consultation. Less than half (43.9%) of the caregivers reported receiving feedback. The caregivers who reported receiving feedback were mostly satisfied with the explanation given of their child's growth. Fifty eight caregivers reported receiving nutrition information during their clinic visit. Table 4.5 also shows the nutrition information given to the caregivers against the information caregivers wanted to know. The table gives a breakdown of the further information desired by the caregivers.

Table 4:5 Caregiver questionnaires responses at seven clinics in Grahamstown sampled from November 2012 to January 2014

Caregiver questionnaire		n	%	95% CI
Caregivers who reported receiving verbal feedback on their child' growth by healthcare worker (N=164)		72	43.9	(36.3; 51.5)
Caregivers satisfied with feedback given on their child's growth (N=71)‡		67	93.9	(88.3; 99.5)
Caregivers who received nutritional information(N=164)		58	35.4	(28.1; 42.7)
Caregivers with additional questions they wanted to ask health workers (N=155)†	feeding and growth related question	1	0.7	(0[#]; 1.9)
	feeding related question	16	10.3	(5.5; 15.1)
	growth related question	28	18.1	(12.0; 24.1)
	Other*	14	9.0	(4.5; 13.5)

*Other: health related concerns which were not nutrition or growth related

‡ Caregivers who received feedback (N=72), n=71 had data on whether they were satisfied with the feedback received or not.

Negative value changed to zero.

4.4APPROPRIATE GMP

The consolidated summary of the indicators used to determine the proportion of children who received appropriate GMP during their clinic visits are given in Figure 2. Amongst all sampled clinics Tantyi Clinic had the largest proportion of children receiving appropriate GMP; the lowest proportion of children receiving appropriate GMP was at Joza and N.G. Dlukulu clinics (Table 4.6). There was a significant difference across facilities in the proportion of children who received appropriate GMP (Chi^2 test for trend using Fisher's exact test, p=0.046; Cramer's V0.28 indicating a small effect).

Several elements of appropriate GMP were found to be deficient in the sample occurring at various steps ranging from anthropometry, interpretation, documentation, counselling and interventions.

Table 4:6 Appropriate GMP per clinic attended by children (N=164)

Clinic attended by children	**Appropriate GMP (N=164)**	
	Count (n)	**Percentage**
Anglo-African (N=12)	3	25.0
Joza clinic (N=25)	3	12.0
Middle Terrace clinic (N=26)	9	34.6
N.G. Dlukulu (N=25)	3	12.0
Raglan Road Clinic (N=31)	10	32.3
Settlers Day Hospital (N=23)	8	34.8
Tantyi clinic (N=22)	11	50.0
All clinics	47	28.7 (21.7-35.6) 95%CI

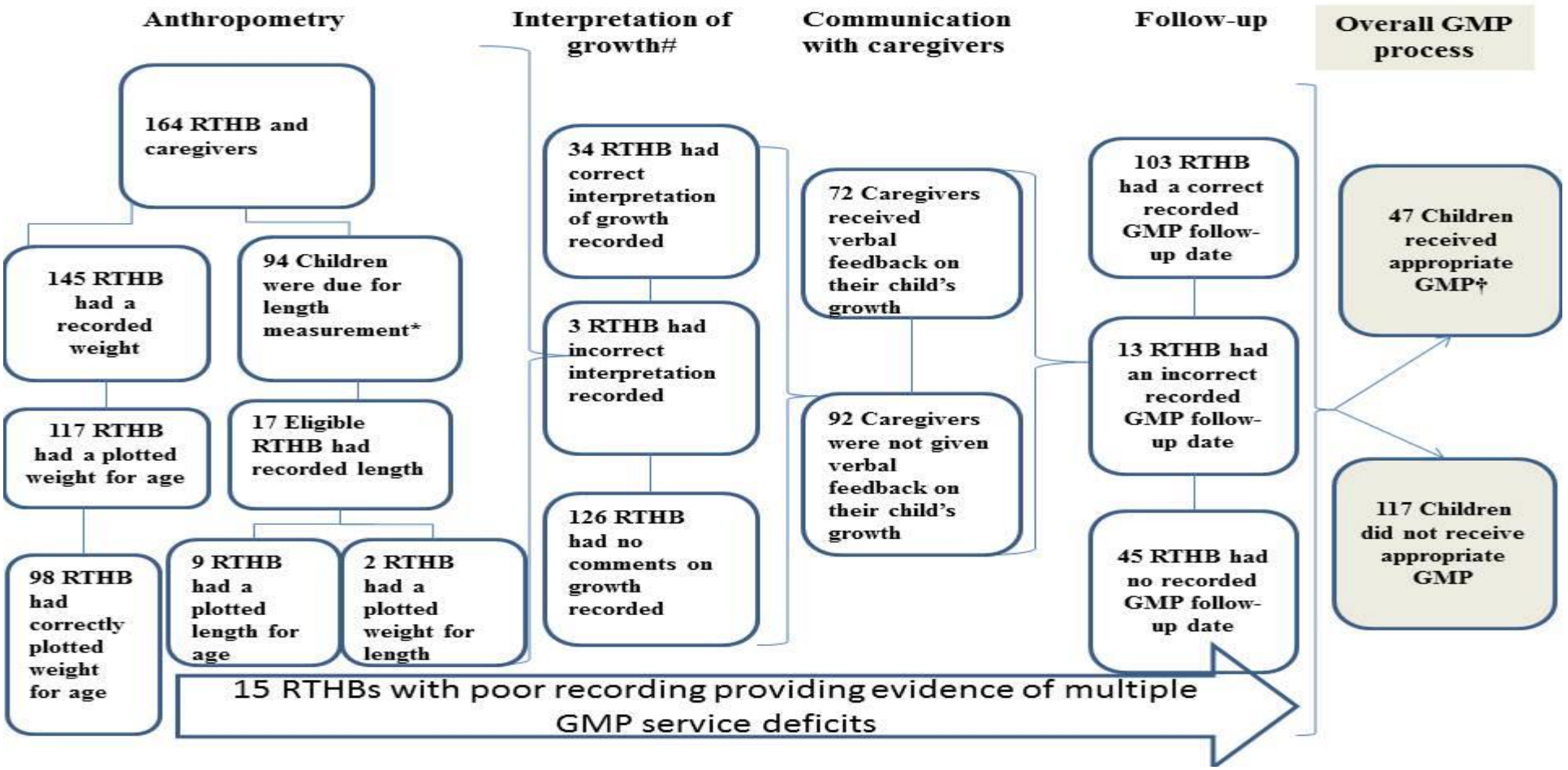

Figure 4.2 GMP practices observed at seven PHC facilities in Grahamstown, Makana sub-district from November 2012 to January 2014

* Length is for 6months periodic measurement

Growth refers to weight-for-age assessment throughout the figure

†appropriate GMP: correct use of weight-for-age index, growth interpreted correctly and discussed with caregiver, interventions promoted or given as indicated and follow-up scheduled as per IMCI or GMP protocol

Among the RTHBs audited, the researcher identified 31/164 (18.9%) RTHBs of children with risk factors for growth (Table 4.7). Only three (9.7%) of the RTHB of these children had a record of appropriate GMP being provided, meaning that there were twenty eight missed opportunities for intervention at the PHC facilities audited. At-risk factors recorded, with largely no action were: growth faltering/flattening growth curve, growth faltering for 3 months or more with no appropriate supplementation, or a feeding risk with no appropriate feeding counselling (see Table 4.7). The missed opportunities included RTHBs of children attending for sick visits with growth faltering, and had not received appropriate intervention as per GMP guidelines, infant and young child feeding policy, nutrition supplementation guidelines and IMCI guidelines. There were six RTHBs indicating children at risk of, or were overweight or obese. On one of these, there was evidence of appropriate GMP for this risk factor as per GMP guidelines, i.e. the caregiver reported receiving appropriate nutritional counselling for the risk factor.

Table 4.7: RTHB of children with identified Risk factors for poor growth (N=31)

Risk factor identified	n	%
Growth faltering	9	5.5
Flattening growth curve for 3 months not given supplements or counselled	3	1.8
Feeding risk	3	1.8
Losing weight	3	1.8
At risk of overweight and overweight/Obese	6	3.7
Weight not plotted for months*	1	0.6
Receiving supplements from the clinic	1	0.6
Sick visit with feeding risk	3	1.8
Underweight for age	2	1.2
Total	31	18.9

* Vitamin A also not given

All missed opportunities detected were brought to the attention of the caregiver by the researcher and were documented in the child's RTHB. The researcher gave brief nutrition counselling when indicated and referred the caregiver to the clinic for further information. The characteristics of children who received appropriate GMP were extracted from the RTHB audit and caregiver interviews and are described in Table 4.8 by age, caregivers' educational status and by which type of healthcare worker weighed the child. The Chi^2 test for trend for children who received appropriate GMP according to age of child, caregivers' educational level and health worker who weighed the child were not significant (p=0.172).

Table 4.8: Characteristics of children and their caregivers who received appropriate GMP at PHC facility in Grahamstown, Makana sub-district from November 2012 to January 2014

	Appropriate GMP(N=164)	Proportion (%) of children who received appropriate GMP within the categories (95%CI)	P-values for Chi-square test
Age of child			
Children ≤ 6 months age (N=80)	28	35.0 (24.5; 45.5)	P=0.172
Children > 6 months to 12 months (N=47)	12	25.5 (13.0; 38.0)	
Children older than 12 months (N=37)	7	18.9 (6.3; 31.5)	
Weighing of children by category of health care worker			
By CHW (N=120)	36	30.0 (21.8; 38.2)	P=0.388
By nurse (N=23)	9	39.1 (19.2; 59.0)	
Caregiver level of education			
Less than grade 12 (N=110)	29	26.4 (18.2; 34.6)	P=0.518
Grade 12 or equivalent (N=46)	15	32.6 (19.1; 46.1)	
Diploma, degree or higher qualification (N=7)	3	42.9 (6.2; 79.6)	

CHAPTER V: DISCUSSION

5.1 GMP PRACTICES

The findings of this study show sub-optimal GMP practices since the introduction of the new RTHB in PHC facilities in the study area. Procedures, like weighing, were often carried out but the implementation of interventions, such as nutrition counselling, was inadequate. Despite most, (92.1%) children being weighed at the PHC facilities, and the child's weight for age being plotted (78.0%), a much lower proportion (28.7%) of children received appropriate GMP, compared to those who had a recorded weight in the RTHB. Failure to give nutrition counselling when children were growth faltering or losing weight, not issuing nutrition supplements when indicated, and not scheduling follow up visits as per IMCI guidelines for children who are not growing well, were some of the implementation gaps identified. There was also poor targeting of children identified in the RTHB as "at risk children", with only (9.4%) receiving appropriate GMP, thus leading to missed opportunities for growth promotion, a goal of the growth monitoring. Suboptimal use of the previous RTHC in the detection and targeting of nutritionally at risk children with appropriate interventions has been reported by Schoeman *at al*, (17). These gaps seemed to persist in the use of the new RTHB as demonstrated by the findings of this current study.

There was a significant difference in children who received appropriate GMP between the seven PHC facilities evaluated. The clinic that performed the best was Tantyi clinic, followed by Middle Terrace and Settlers Day Hospital. Joza clinic was the clinic that performed the worst. Joza clinic had the highest PHC headcount for children under-five years of all the seven clinics. Under performance in implementing quality GMP services at PHC facilities can be due to resource and time constraints.(22) Despite observed differences in appropriate GMP for the different age groups of children, caregivers' educational level and category of health worker, these differences were not significant. The PHC facility attended by the child was the significant indication of whether or not the child received appropriate GMP.

Faber at al reported that the recruiting, training and supervision of lower category health cadres, such as CHWs, can affect the quality of GMP services.(47) In this current study CHWs were more involved in GMP services compared to nurses, except for Settlers Day Hospital. The quality of GMP services offered by this cadre of staff in these facilities needs to be explored further. Pre-service and in-service training of nurses has also been blamed for poor performance of nutrition services such as GMP.(21, 48) Cloete et al, (21) reported that some nurses working at PHC facilities at a sub-district in the Western Cape province of South Africa lacked appropriate knowledge to utilise the new RTHB effectively although they had been trained in its utilisation. Poor utilisation of the previous RTHC were reported by Kitenge and Govender in the Makhado sub-district of Limpopo province of South Africa.(45) At the Grahamstown clinics, most professional nurses had been trained in IMCI, and a representative from each clinic in GMP using the new RTHB. (Hermans, P. Personal communication).

This study found that length-based indices were not used routinely in the growth assessment of most of the children sampled, this despite the new RTHB establishing the use of length-based indices in child growth assessment. This was consistent to previous findings that length-based indices are not routinely used in child growth assessment in African countries.(35) This practise still appears to persist, as in Jonker and Stellenberg's study, (43)

looking at the experiences of caregivers attending primary care facilities, it was reported that despite all caregivers reporting their children had been weighed, none of them verbalised that their children's length/height had been measured. At the launch of the WHO growth standards for the African region, the need to utilise length-based indices for child growth assessment was emphasized as recommended in current literature.(5, 18, 23, 24, 34) The WHO recommendation also urged countries to decide on indicators for use in GMP based on their prevalence of stunting, underweight and wasting.(18) In South Africa stunting is the most prevalent form of undernutrition, and the SANHANES-1 survey further reinforces the need to scale up routine use of length measurements in child growth assessment.(26) In the current study, the routine use of length-based indices was sub-optimal.

Length-based indices as additional indicators in GMP require more time, resources and training to prevent measurement errors and useful interpretation for targeting for interventions.(18, 21) The implications of routine measuring of length and use of length-based indices will assist in detecting the need for nutrition interventions to address stunting and overweight or obesity, thereby addressing the increasing prevalence of these nutritional problems in preschool children in South Africa.(24, 26) In this study the results showed poor detection and intervention in cases of risk or presence of growth faltering, overweight or obesity; this despite the updated RTHB and refocus on GMP through training intervention. Vitamin A coverage among the children surveyed was high. This was a positive observation despite the low appropriate GMP prevalence.(3) It was mentioned in the literature review of this study that services such as immunisation tended to receive more attention at PHC facilities.(38, 44)

5.2 CAREGIVERS EXPERIENCES AND PERCEPTIONS OF GMP

The common experience for most caregivers was that their child was weighed, their weight plotted, with no verbal feedback on growth. Those caregivers who did receive feedback were satisfied with the explanation or reasoning of the interpretation of their child's growth. The information that caregivers wanted to know from the health workers during their PHC visit, indicated that most caregivers were interested in their child's growth and nutrition information; most of the caregivers were the parent of the child, a possible reason for their interest in feedback on the child's growth and nutrition. Other researchers have also found that caregivers are interested in the GMP process.(38, 39, 47, 48) If implemented well, GMP could encourage caregiver engagement in their child's growth assessment, analysis and actions to improve growth.(3)

Many of the caregivers did not receive nutrition counselling during their visit. Some indicated that they were counselled at a previous visit. It is possible that nutrition counselling might have been done at previous visits as in some cases this was documented in the child's RTHB. GMP does not require nutrition counselling to be done at each PHC visit, but there are guidelines of when it is indicated and the guidelines were used to determine if the child received appropriate GMP or not in this study. These guidelines ensure that the promotion of adequate growth and the targeting of nutrition messages are done at appropriate or key periods of a child's growth and development. This includes early postnatal counselling on exclusive breastfeeding and complementary feeding from six months. The IMCI guidelines, (51) however require that caregiver of children attending for sick visits receive nutrition counselling. This was used to assess appropriate GMP for sick children.

The current study showed that caregivers' of children at critical nutrition periods, i.e. early postnatal, sick children and six months old were not targeted for nutrition counselling. Not

receiving nutrition counselling was a missed opportunity to reinforce the messages of exclusive breastfeeding in the first six months, complementary feeding and feeding of the sick child. The poor implementation of targeted nutrition counselling at these key visits can have a negative impact on child growth and will limit the effectiveness of GMP programs. Nutrition counselling ensures that nutrition messages are individualised and address the caregivers concerns. Generalised nutrition messages, which do not consider the caregivers individual socioeconomic background, may be ineffective to address growth problems.(39, 48) Charlton et al, (48) also noted the limiting effect of socioeconomic determinants of health on the impact of GMP. The findings of this study indicate a possible need to strengthen health workers' nutrition counselling skills if the strategic role of GMP in infant and young child feeding counselling is to be utilised effectively.(12, 13, 27)

Other possible reasons for poor implementation of nutrition counselling in GMP might be due to training and implementation of GMP emphasizing the technical aspects of weighing and plotting, this is apparent in the literature evaluating the impact of GMP. The conflicting conceptual view between GMP policy makers and implementers needs to be addressed.(4, 12, 18, 44) These results indicate that growth or nutrition counselling is not a key input in the implementation of GMP in clinics in Grahamstown, Makana Sub-district. This is a significant gap and needs to be addressed as nutrition counselling for exclusive breastfeeding and appropriate complementary feeding is one of the recommended evidence based strategies to improve child health.(8) Some researchers have even looked at the impact of nutrition counselling without the use of growth monitoring and evidence of positive impact on child growth have been observed.(31) GMP programs can thus benefit significantly from improving the nutrition counselling component of their processes.

PHC infrastructure, staff shortages and time constraints can impact on the quality of GMP services and nutrition counselling.(22, 31, 48) It was noted during this study that weighing was often carried out in a group setting. It has been documented that caregivers can experience feelings of embarrassment if there is a lack of privacy where GMP services are rendered, possibly influencing caregivers experiences of GMP.(38)

5.3 BIAS AND LIMITATIONS

Bias in the study can compromise the validity of the results and may have arisen at various stages in the study thus leading to information or selection bias.

5.3.1 Information bias

The tools utilised for the study were designed by the principal investigator who works in the area as a dietitian. Knowledge of the practices for GMP in the PHC facilities in this area enabled her to design the checklist and questionnaires based on the Department of Health GMP guidelines. The tools were piloted at a local hospital; during this stage, the training of the research assistant was done. The skills of the assistant were monitored in the early stages of the interviews and the principal investigator checked and entered the data on the data base alone. The questionnaire mainly utilised closed ended questions, thus minimizing information bias. As discussed before, the caregivers' responses might have been affected because the interviews were carried out at the PHC facility.

5.3.2 Selection bias

Eligible children's caregivers and their RTHBs were sampled consecutively. This might have introduced bias as they were not randomly selected. Anonymous caregiver questionnaires

were used to limit bias. The respondents were informed prior to participating that all information collected would be kept confidential and their identity would not be divulged to the clinic personnel. However, interviews were carried out at the PHC site; this might have caused social desirability bias. The study had a high response rate, thus limiting bias from non-responders.

5.3.3 Limitations

The study design only described the GMP practises, but it did not enable analysis of the reasons for the poor implementation of GMP practises identified. The study used non-probability sampling and since it was not analytical in design, this was accepted. Children sampled were not stratified according to age to ensure proportional representation according to age and to prevent possible bias arising in appropriate GMP according to the age of the child, although the results from this study did not show significant differences in appropriate GMP due to age. The sample size was small and did not account for inter cluster correlation; since this study was a purely descriptive study, with the aim of describing GMP practices at PHC facilities the smaller sample size was accepted.

The study excluded children who did not have a RTHB on the day of the survey thus possibly causing a bias for inclusion of children who were more likely to receive appropriate GMP, but the since the study was designed to describe the use of the new RTHB in GMP the study objectives were not affected by this.

GMP experiences were reported by the caregivers after the consultation was concluded, thus were not observed directly and this might have led to recall bias. The study used the recorded GMP practises in the RTHB to verify the caregivers reported GMP experience, but the healthcare workers implementation was not directly observed. There was an attempt to verify if GMP activities were conducted or not by cross checking between the caregiver's responses on the questionnaire and the RTHB audit tool of that respondent when deciding if the child received appropriate GMP.

The study only enrolled children aged 0-24 months, thus excluding children 2-5 years old who may also be vulnerable to inappropriate or suboptimal GMP and related services such as Vitamin A. These vulnerabilities are thought to be more critical in the first 1000 days, up 24 months age group and thus it was decided to conduct the study focusing on this age group.

CHAPTER VI: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter presents conclusions reached from the results of this study and the recommendations arising from these.

6.2 CONCLUSIONS

The RTHB booklet audit and caregivers reported that children attending PHC facilities at facilities studied were weighed routinely. Often this information was not used to implement interventions using the Department of Health framework for GMP. This was evident from the difference between children weighed and those who received appropriate GMP. Growth faltering, sick children, overweight/obese children were poorly targeted with nutrition counselling and other healthy growth promotion interventions. The prevalence of appropriate GMP received by the study children and their caregivers, differed according to the PHC facility attended by the child.

Caregivers were not routinely engaged in discussions of their child's growth although the study revealed that most were interested in this information. Caregivers were interested in the GMP process, including feedback and discussion of their child's growth and they wanted feeding advice. This indicates an opportunity to engage caregivers in the analysis of their child's growth, which can enable nutrition counselling.

Length-based indices were not used routinely in GMP, a significant gap in implementation, since one of the objectives of the new RTHB was to establish the periodic use of these in child growth assessment.

There was high coverage of Vitamin A supplementation among the children studied.
The follow up schedule of growth faltering children, i.e. fourteen days, as per IMCI guidelines was not adhered to, they were often given the routine one month follow up.

6.3 RECOMMENDATIONS

Given that this was a descriptive study, further investigation is required of the reasons for significant differences in appropriate GMP according to the clinic attended by the child and caregiver.
Targeting of growth faltering, sick, overweight/obese children with appropriate growth promoting interventions associated with GMP needs to be optimised.

GMP needs to emphasize caregiver engagement in child growth assessment and feeding advice as caregivers are interested in this information and it is essential to the GMP concept. The involvement of CHW in GMP at primary care facilities in Grahamstown was significant, and needs to be optimised. Implementation of length measurement, plotting and interpretation of length-based indices needs to be reviewed to ensure optimal implementation.

6.4RECOMMENDATION FOR FURTHER STUDY

The nutrition counselling skills of CHWs and nurses working in PHC facilities and community outreach programmes need to be studied, as this study did not evaluate the quality of the nutrition advice given to the caregivers. Further studies are needed of the necessary conditions that are needed for optimal or appropriate GMP. These studies can include:

a) Explore missed opportunities and targeting of at-risk children through GMP.

b) Explore health workers understanding of the growth indices: plotting, interpretation, and appropriate interventions.
c) Explore health system factors associated with poor implementation of GMP at clinic and sub-district level.
d) Intervention studies comparing effectiveness of intervention to improve quality of GMP practises.

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Appendix 1: RTHB audit checklist

Age of the child in months:……

Recorded by (name): **Name of facility/site:**

Procedures	**Appropriate GMP indicators**	**Recorded**	**Not recorded**	**Correctly recorded or interpreted**	**Not applicable or comments**
Weight done at this visit	Recorded numerically under clinical notes or on growth chart				
Weight plotted at this visit (if not due mark as not applicable)	Monthly plotting				
Height measured* (if not due mark as not applicable)	At least every 6months				
Height plotted (or not applicable)					
Weight for height/length plotted					
Comments on growth	Growing well Good weight gain Normal weight Gaining weight				
	Flattening of curve Growth faltering Not gaining weight Low weight for age or height Not growing well				
	Weight loss Very low weight Wasting Stunting Severe malnutrition				
Nutrition intervention	Counselling or education on exclusive breastfeeding or appropriate formula feeding (0-6months children) Complementary feeding or foods (6-12months) Feeding the sick child Vitamin A# (if severe malnutrition or due for 6months prophylaxis) Deworming+ Supplementation if below 3rd percentile/ underweight for age or length/malnourished/growth				

	faltering for 3 consecutive months				
Referral (when indicated)	Severe malnutrition Continued weight loss or not gaining weight after interventions				
Scheduled follow up	Feeding problem after 5 days Not growing well after 14days (2 weeks) Normal GMP after 1 month				

***where length measuring equipment is available, e.g. length board**

 # record as non-applicable if not due for prophylaxis or is not severely malnourished

+routine for all children older than 1 year, given every 6months

Appendix 2: Caregiver questionnaire

QUESTIONNAIRE **No** ☐

NAME OF FACILITY/SITE:_____

Name of Interviewer:_____

Please fill in the fill in all the answers to the questions below. You can use a pen of any colour. Explain to the caregiver that the name of the client or caregiver will not be used as the information provided will be anonymous and will be kept confidential.

Date:_____

Location:_____

Caregiver Interviews

Age of the child (months):…… Age of the caregiver (years):.....

Relationship of caregiver to the child:……

1. Was your child weighed at this clinic/site visit? (tick one)

Yes ☐ No ☐

2. If yes, who weighed the child? (tick one)

Nurse ☐

CHW ☐

Other(specify):…….

Not applicable (child not weighed at this visit) ☐

3. Did the person who weighed the child talk to you about how the child is growing?

Yes ☐ No ☐

4. Did anyone else during this clinic/site visit talk to you about how your child is growing?

Yes ☐ No ☐

5. If yes to question 4, who was it?

Nurse ☐

CHW ☐

Other(specify):…….

Not applicable ☐

6. What was said about your child's growth? (tick one)

Growing well ☐ Not growing well ☐ Nothing said ☐

NB: Check RTHB of caregiver's child for comments on the growth

Recorded ☐ Not recorded ☐

7. Were you satisfied with the with the information your received of how your child is growing?

Strongly agree	agree	disagree	strongly disagree

8. What more information would you have liked to receive?:……
……

9. Were you given any information on feeding your child during this visit?

Yes ☐ No ☐

10. What was said about when to bring back the child for weighing?

After a month ☐

Not told ☐

Other (specify):……

NB: Check if next date for growth monitoring is recorded in the caregiver's child RTHB

Recorded ☐ Not recorded ☐

Highest education level of the caregiver:

☐ < Grade 12 ☐ Diploma, degree or higher

☐ Grade 12 or equivalent ☐ Other (specify)……

Appendix 3: Ethics approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

10 September 2012

Ms Z Hlombe Mfono
P/Bag x1007
Settlers Hospital
Grahamstown, 6140

Dear Ms Mfono

PROTOCOL: An evaluation of growth monitoring and promotion activities at primary health care facilities and growth monitoring sites. REF: BE190/11

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 04 October 2011.

The study was provisionally approved pending appropriate responses to queries raised. Your responses dated 10 August 2012 to queries raised on 06 August 2012 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given full ethics approval and may begin as from 10 September 2012.

This approval is valid for one year from **10 September 2012.** To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2004), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its next meeting taking place on **09 October 2012.**

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor D.R Wassenaar
Chair: Biomedical Research Ethics Committee

Professor D Wassenaar (Chair)
Biomedical Research Ethics Committee
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 2384 **Facsimile:** +27 (0)31 260 4609 **Email:** brec@ukzn.ac.za
Website: http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

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YAKWAZULU-NATALI
RESEARCH OFFICE
BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 260-4609
Email: BREC@ukzn.ac.za
Website: http://research.ukzn.ac.za/ResearchEthics/BiomedicalResearchEthics.aspx

23 August 2013

Ms Z Hlombe Mfono
P/Bag x1007
Settlers Hospital
Grahamstown
6140

Dear Ms Mfono

PROTOCOL: An evaluation of growth monitoring and promotion activities at primary health care facilities and growth monitoring sites. REF: BE190/11

PROTOCOL RECERTIFICATION RATIFICATION

Further to our letter to you dated 18 July 2013, this letter serves to notify you that at a full sitting of the Biomedical Research Ethics Committee Meeting held on **13 August 2013**, the Committee RATIFIED the sub-committee's decision to approve the Recertification of the above protocol.

Yours sincerely

Mrs A Marimuthu
Senior Administrator: Biomedical Research Ethics
DW/JL

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RESEARCH OFFICE
BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 260-4609
Email: BREC@ukzn.ac.za
Website: http://research.ukzn.ac.za/ResearchEthics/BiomedicalResearchEthics.aspx

13 December 2013

Ms Z Hlombe Mfono
P/Bag x1007
Settlers Hospital
Grahamstown
6140

Dear Ms Mfono

PROTOCOL: An evaluation of growth monitoring and promotion activities at primary health care facilities and growth monitoring sites. REF: BE190/11

I wish to advise that your application for Amendments dated 21 November 2013 for the above study has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee.

The following are noted and approved:

- Reduction of sites to 6 clinics and 1 community health centre
- Reduction of sample from 190 children to 155 children

The approval will be noted by a full Committee at a meeting to be held on **11 February 2014.**

Yours sincerely

Ms A Marimuthu
Senior Admin Officer: Biomedical Research Ethics

Appendix 4: Postgraduate education committee approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

10 August 2012

Ms ZH Mfono
Department of Public Health Medicine
Howard College

Dear Ms Mfono

PROTOCOL:"An evaluation of Primary Health Care Growth, Monitoring and promotion activities in the Makana sub-district, Eastern Cape" 992225486

Your protocol has been given final approval of the abovementioned study on 30 July 2012. This will be ratified at the next Postgraduate and Research & Higher Degrees Committee Meeting.

Please note:

- The Postgraduate Committee must review any changes made to this study.
- The study may not begin without the Final approval of the Biomedical Research Ethics Committee. Please provide the Postgraduate Office with a copy of the Final Approval from BREC, once this is obtained.

May I take this opportunity to wish you every success with the study.

Yours sincerely

Mrs Devi Arumugam
Postgraduate Administrator
School of Nursing & Public Health

CC. Dr AS Voce
Public Health Medicine

Postgraduate Administration
School of Nursing and Public Health
University of KwaZulu-Natal
Postal Address: University of KZN, Durban, 4041, South Africa
Telephone: +27 (0) 31 260 2499
Facsimile: +27 (0) 31 260 1543

UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

06 March 2014

Ms ZH Mfono
Student No 992225486
Discipline of Public Health Medicine
School of Nursing & Public Health

Dear Ms Mfono

RE: AMENDMENT TO PROTOCOL

Your application for approval of amendment to your protocol as per your letter dated 10 February 2014 has been approved subject to the same being approved by the Biomedical Research Ethics Committee.

If you have already submitted this to BREC kindly send us a copy of their response or send us their response once it has been received by yourself.

Kind Regards

Mrs Devi Arumugam
Postgraduate Administrator
School of Nursing & Public Health

Postgraduate Administration
School of Nursing and Public Health
University of KwaZulu-Natal
Postal Address: University of KZN, Durban, 4041, South Africa
Telephone: +27 (0) 31 260 2499
Facsimile: +27 (0) 31 260 1543

Appendix 5: Eastern Cape Department of Health approval

Eastern Cape Department of Health

0833781203

Enquiries:	Zonwabele Merile	Tel No:	040 608 0830
Date:	03rd October 2012	Fax No:	043 642 1409
e-mail address:	zonwabele.merile@impilo.ecprov.gov.za		

Dear Ms ZH Mfono

Re: An Evaluation of Primary Health Care Growth Monitoring and Promotion activities in the Makana sub-district, Eastern Cape

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

DEPUTY DIRECTOR: EPIDEMIOLOGICAL RESEARCH & SURVEILLANCE MANAGEMENT

PERMISSION TO CONDUCT A RESEARCH STUDY/TRIAL

This must be completed and submitted to the Medical Superintendent/s / Hospital Manager/s for signature.

For **King Edward VIII Hospital (KEH) and Inkosi Albert Luthuli Central Hospital (IALCH)** studies please submit the document together with the following:

1. Research proposal and protocol.
2. Letter giving provisional ethical approval.
3. Details of other research presently being performed by yourself if in the employ of KEH, (individually or as a collaborator).
4. Details of any financial or human resource implications to KEH, including all laboratory tests, EEGs, X-rays, use of nurses, etc. (See Addendum 1)
5. Declaration of all funding applications / grants, please supply substantiating documentation.
6. Complete the attached KEH Form - *"Research Details"*

Once the document has been signed it should be returned to **Mrs Patricia Ngwenya:** Biomedical Research Ethics Administrator, Room N40, Govan Mbeki Building, Westville Campus, University of KwaZulu-Natal.

To: Chief Medical Superintendent / Hospital Manager

Permission is requested to conduct the above research study at the hospital/s indicated below:

Site 1 address:
MAKANA SUB-DISTRICT
49 BEAUFORT STREET P/BX1023
GRAHAMSTOWN

Investigator/s:
Principal: Z.M. MPOMO
Co-investigator: MIA
Co-Investigator: MIA

Signature of Chief Medical Superintendent/Hospital Manager: SUB DISTRICT MANAGER.
Date: 2021/04/20

DEPARTMENT OF HEALTH
PROVINCIAL S.A. OFFICE
APR 2021
PRIVATE BAG X1023
GRAHAMSTOWN, 6140

Site 2 address:
_____
_____
_____

Investigator/s
Principal: _____
Co-investigator: _____
Co-Investigator: _____

Signature of Chief Medical Superintendent / Hospital Manager:
_____
Date: _____

NB: Medical Superintendent/s / Hospital Manager/s to send a copy of this document to Natalia

Appendix 6: Participant information sheet and consent form

27 November 2012
Dear Ms/Mrs/Mr
Thank you for taking time to read this information. The purpose of this letter is to give you information and request your participation in a study that I, Hlombekazi Mfono, am conducting in the Makana sub-district. I am a Masters in Public Health student with the University of KwaZulu-Natal (address below) who is conducting a study to see how children's growth is being monitored and promoted in the Makana sub-district. This information will help the Department of Health to improve its service to children and their caregivers.

The study will include going through your child's Road to Health Booklet; I need to go through the booklets of at least 760 children and interview their caregivers also to get enough information. The children will be selected from all clinics and growth monitoring sites in the Makana sub-district. At each clinic or site I will select all the children 2 years and younger until I reach all the numbers I need from that clinic or site. The information will be anonymous and will be kept confidential; to prevent repetition I will record the name, surname and date of birth of your child on my register and this information will only be available to myself and the research assistants. We will use a checklist to record the information we get from the booklets. You as the child's caregiver will then be requested to participate in a short interview consisting of about ten questions. Participation in this research study is voluntary; you have a right to choose to participate or to refuse to be part of this research study and there are no negative consequences for refusing, for you or your child. No incentives or rewards will be offered for participating; you may choose at any time during the booklet review or interviewing to stop participating in this study.
The findings of this study will be shared with the staff of all participating clinics and sites once the study has been concluded to improve services of growth monitoring and promotion. The participants' names will not be used and it will be impossible for clinic staff to know who has or has not been part of the study.
This study has been ethically reviewed and approved by the UKZN Biomedical research Ethics Committee (approval number BE 190/11).

In the event of any problems or concerns/questions you may contact the researcher at (provide contact details) or the UKZN Biomedical Research Ethics Committee, contact details as follows:
BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Researcher
Zitandile Hlombekazi Mfono
P/BAG X1007
Settlers Hospital

Grahamstown
6140
Contact number: 046 602 5000
Email address: patpoem@yahoo.com

CONSENT

I _____ have been informed about the study entitled Evaluation of growth monitoring and promotion by _____.

I understand the purpose and procedures of the study.

I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any treatment or care that I would usually be entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at the address given above.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

_____ _____

Signature of Participant **Date**

_____ _____

Signature of Witness **Date**