

**QUALITY OF CARE PRACTICES PROVIDED TO CHILDREN UNDER  
FIVE YEARS OF AGE IN TEMEKE MUNICIPAL, DAR ES SALAAM**

**ELIETH DEOGRATIAS RUMANYIKA**

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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## ABSTRACT

This study was carried out to assess quality of care practices provided to children of below five years of age in Temeke Municipality Dar es Salaam. The study consisted of two phases, the first phase was development of a care assessment tool (Care Score Index) and the second phase was assessing the quality of care practices in the study area using the developed tool. The tool comprised of four parameters of child care practices which are maternal health seeking practices and child immunization, child feeding practices, psychosocial care practices and hygiene practices. A total of 198 mothers with their children were randomly selected to participate in a cross-section study in four wards of Temeke Municipal. Data were analysed using IBM SPSS version 20 and WHO Anthro software version 3.2.2. The development of Care Score Index has been taken as a first step in formulating a more universal tool to be used for assessing child care practices within households in different societies in Tanzania.

Respondents were found to have good care practices with high proportion of scores in category one which represented higher scores, except for maternal health seeking practices whereby greater proportion were in category two (lower scores). Maternal factors such as education, marital status, occupation and number of children were found to have no significant association with quality of care practices. The overall care score was significantly associated with underweight ( $p=0.003$ ) while child feeding practices score was significantly associated with underweight ( $p=0.009$ ) and wasting ( $p=0.017$ ). The study concluded that composite of index for dimension of quality of child care practices has potential in assessing health and nutrition outcome. Therefore, it is recommended that coverage of more varied type of stakeholders should continue in developing and validating simple tools to measure care practices that can be used in different societies in Tanzania.

**DECLARATION**

**I, ELIETH DEOGRATIAS RUMANYIKA**, do hereby declare to the senate of the Sokoine University of Agriculture that this dissertation is my original work, done within the period of registration and that it has neither been submitted nor been concurrently submitted for a higher degree award in any other Institution.

.....

**Elieth Deogratias Rumanyika**  
**(MSc.Candidate)**

.....

**Date**

The above declaration confirmed by:

.....

**Prof. John Msuya**  
**(Supervisor)**

.....

**Date**

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**DEDICATION**

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**LIST OF ABBREVIATION**

WHO	-	World health organization
LMIC	-	Low and Middle Income Countries
NBS	-	National Bureau of Statistics
TFNC	-	Tanzania Food and Nutrition Center
NMNAP	-	National Multi-sectrol Nutrition Action Plan
MDG	-	Millenium Development Goal
SDG	-	Sustainable Development Goal
TDHS	-	Tanzania Demograpic Health Survey
UNICEF	-	United Nations Children’s Fund
WASH	-	Water Sanitation Hygiene
DDS	-	Dietary Diversity Score
SUA	-	Sokoine University of Agriculture
P VALUE	-	Probability Value
ANC	-	Antenatal care
BCG	-	Bacille Calmette-Guerin
DPT	-	Diphtheria, Tetanus and Pertussis
OPV	-	Oral polio vaccine
SPSS	-	Statistical Package for Social Science
HAZ	-	Height for age Z score
WAZ	-	Weight for age z score
WHZ	-	Weight for height z score



## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background Information

Child care refers to the behaviours and practices of caregivers (mothers, siblings, fathers, and childcare providers) to provide the food, health care, stimulation, and emotional support necessary for child healthy survival, growth, and development (WHO, 2004). These practices translate food security and a health care resource into a child's wellbeing (Bronte-Tinkew *et al.*, 2007). Other key aspects that has much impact on child nutrition include care of pregnant and lactating mothers, feeding of young children, care of children during illness, psychosocial care of children, food preparation and storage, and hygiene (Arimond and Ruel, 2002).

Inadequate maternal health seeking behaviour affects the natural growth of foetus/infant (Warriner, 2018), where by the process of infant becoming undernourished often starts in uterus and may persist after birth and even throughout the life cycle (Wang *et al.*, 2016). Poor maternal nutrition brings about life long consequences that extend into adolescent and adulthood, thereafter, turning round affecting several generations (Mason *et al.*, 2012). Child care has therefore received increasing attention on improving nutrition to address under nutrition among children. There are several studies of educational programmes aiming to reduce under nutrition through influencing the adoption of better child care practices such as early initiation of breastfeeding and increased dietary diversity, and maternal factors that mediate between quality of care and the child nutrition and health outcomes (Frost *et al.*, 2005).

## 1.2 Problem Statement and Justification

Millions of children under 5 years of age in low and middle-income countries (LMIC) fail to reach their potential in term of growth and development (Grantham-McGregor *et al.*, 2007) due to poverty, poor health and nutrition, and inadequate care. In Tanzania, under five mortality rate is 67 deaths per 1,000 live births, infant mortality rate is 43 deaths per 1,000 live births (NBS, 2016), and the prevalence rate of stunting is 34.7% (TFNC, 2014). Stunting is attributed to a combination of factors, including maternal under nutrition, inadequate infant feeding practices, and low quality of health care and poor hygiene (Black *et al.*, 2013).

Numerous efforts in form of programmes for integrating health, nutrition, and promotion of child development have been undertaken under the National Multi-sectoral Nutrition Action Plan (NMNAP) so as to improve nutrition outcomes (TFNC, 2014). Political interest in nutrition has been sensitive with reference to the Millennium Development Goals (MDG's) and Sustainable Development Goals (SDG's). Actions have been taken to support the political interests of strengthening nutrition programmes on improving maternal and child wellbeing. Therefore, several authors have attempted to review works done on infants feeding, hygiene and health care (Engle *et al.*, 2007; 2011; Dieterich *et al.*, 2013; Rajesh and Bhavana, 2016). The link between under nutrition and some of care parameters such as infant feeding practices has been well established (Black *et al.*, 2008). Under nutrition rises sharply during the first two years of life in most countries which coincides with period of complementary feeding whereby deficits acquired at this age are difficult to compensate later in childhood (Trandafir *et al.*, 2018). However, efforts to measure the link of under nutrition with the four parameters of child care practices have been very limited due to methodological problem and also because care practices

encompass a series of related behaviours that must be considered simultaneously, which are difficult to combine into one or few variables that accurately reflect the practices (Garg and Chanda, 2009). Also consideration of quality of child care practices in intervention strategies has been limited (Rajes and Bhavana, 2016). Similarly, there is no standard childcare index (tool) to measure all aspects of child care practices (Ruel and Menon, 2002). Based on the above noted knowledge gap, this study aims to develop a tool for assessing the quality of childcare practices by adapting an approach by Arimond and Ruel (2002) and procedures by Mazziota and Pareto (2013).

Arimond and Ruel as well as Mazziota and Pareto have attempted to make use of various types of indices. The tool in this study is also based on an index that considers five parameters namely health seeking practices, child immunization, child feeding practices, psychosocial and hygiene practices for assessing the quality of care practices of children under five years of age.

### **1.3 Objectives**

#### **1.3.1 General objective**

The general objective of this study is to develop a tool for assessing the quality of care practices of children of below five years of age, and to use the developed tool to explore various attributes of care.

#### **1.3.2 Specific objectives**

The above general objective was attained by undertaking the following specific objectives:

- (i) To develop a tool for assessing quality of child care practices in the households

- (ii) To assess quality of child care practices using the developed tool.
- (iii) To determine maternal factors that are associated with child care practices
- (iv) To determine the relationship between quality of child care and nutrition status.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Maternal Health and Child Nutrition**

Adequate maternal nutrition is critical from conception through the first 6 months of life to improve nutritional status and reduce the risk of poor birth outcomes, such as low birth weight and preterm birth (Bourassa *et al.*, 2019). Unfortunately, programmes have targeted implementation and monitoring of nutrition interventions to infants and young children, rather than to women before and during pregnancy or post-partum (Kavle and Landry, 2018). Mothers and new-borns in the poorest households are less likely to receive a post-natal check-up (Bwalya *et al.*, 2017). In Tanzania, the majority (66%) of mothers and new-borns are not receiving recommended postnatal care within 2 days after birth (NBS, 2016). As a result, they tend to be exposed to elevated risks associated with infections and post-birth complications which will affect health and nutrition of the new-born (Aizer *et al.*, 2015).

#### **2.2 Immunization and Nutritional Outcome**

The relationship between child immunization and prevention of under nutrition is well-established as it influences child nutritional status and lead to improved child growth in developing countries (Anderson *et al.*, 2015). Tanzania Demographic Health Survey shows a little change in vaccination rates among young children over the past decade, where by the percentage of children 12-23 months who received no vaccinations has declined from

4% in 2004-05 to 2% in 2010, and remained there in 2015-16 (NBS, 2016). However, it is well known that partially immunized and non- immunized children are more likely to be at higher risk of under nutrition (Bwalya *et al.*, 2017).

## **2.3 Infant and Young Child Feeding Practices**

Poor feeding practices in early childhood contribute to the burden of under nutrition and infant and child mortality (Patel *et al.*, 2010). It has been documented that the frequency, amount, energy-density, and diversity of food are important issues in complementary feeding (Sinhababu *et al.*, 2010; Ruel, 2017). In addition, characteristics of diet, child's appetite, availability of food and caregiver-child interaction in feeding are known to influence nutrition outcome of a child (Katepa-Bwalya *et al.*, 2015).

### **2.3.1 Breastfeeding**

Initiation of breastfeeding within one hour after birth, helps infants to get the first breast milk commonly known as colostrum, which has nutrients and antibodies for diseases prevention (Liben *et al.*, 2016). Also, early initiation of breastfeeding reduces the risk of low birth weight when it is done within 24 hours as well as reducing postpartum haemorrhage in mothers (Kanyunyuzi *et al.*, 2017). Early initiation of breast feeding as well as exclusive breastfeeding during the first six months protect children from common childhood illnesses and infections such as diarrhoea, upper respiratory tract infections and under-nutrition (Ogbo *et al.*, 2016). Breast milk contains disease fighting substances that support the body with natural immune system which protect children against infections and chronic illnesses. Breastfed babies have been found to grow well mentally, physically and psychologically (UNICEF, 2008).

### **2.3.2 Complementary feeding practices**

At six months of age, breast milk alone cannot provide sufficient nutritional requirements to infants (WHO, 2001). Timing in introduction of complementary foods and the types of

complementary foods are known to affect child's nutritional status (Carletti *et al.*, 2017). Early introduction of complementary foods is known to increase infant mortality and morbidity (Dewey *et al.*, 2001). It also inhibits the uptake of nutrients found in breast milk (Dewey, 2002). On the other hand, late introduction of complementary foods increases the risk of nutrients deficiencies and under-nutrition to infants (Przyrembel *et al.*, 2012). Complementary foods should be easy to eat and consist of a good balance of macronutrients, micronutrients and should be free of pathogens and toxins (Wieser *et al.*, 2018).

### **2.3.3 Minimum dietary diversity and meal frequency**

To reduce the risk of under-nutrition for children below five years of age, the complementary foods introduced should meet the minimum dietary diversity and the minimum meal frequency per day (Olatona *et al.*, 2017).

Nutrient and energy dense food is required during introduction of complementary foods at six months. In order to achieve this, dietary diversity should be given attention (Frempong and Annim, 2017). To measure the quality of dietary diversity, seven food groups namely (1) grains, roots and tubers (2) legumes and nuts (3) milk and dairy products (4) meat, fish and poultry (5) eggs (6) vitamin A rich fruits and vegetables (7) other fruits and vegetables are used to calculate the minimum dietary diversity (WHO, 2010). To meet the minimum dietary diversity a child should consume at least four food groups out of seven groups (WHO, 2008). In addition to that, the complementary food should meet the minimum meal frequency recommended by WHO (2010). The recommendation emphasize that children between 6 - 8 months should be fed 2 - 3 times a day while 9 - 24 months children should be fed 3 - 4 times a day with addition of 1 - 2 nutritious snacks.

## **2.4 Psychosocial Care Practices**

Psychosocial care practices are important in the promotion of growth and development of children (Richter *et al.*, 2017). Child growth and development is influenced by social and psychological ability of a caregiver. Psychosocial care is responsive interaction between children and care-provider to support children's development, including acquisition of language and other means of communication through attention, affection and involvement, encouragement of exploration and learning, responsiveness to developmental milestones and cues, and protection from child abuse and violence (Jeon *et al.*, 2018). This can be achieved by talking to the child, storytelling, hugging the child, having a safe and attractive environment and encouraging the child to be independent (Carvalhaes and Benicio, 2006).

Good psychosocial care in the first three years of life has a positive effect on nutritional status of a child and also influences the social, emotional and cognitive development of a child's cues delivered through the provision of affection, attention, interaction and responsiveness from the mother or caregiver (Sanders and Turner, 2018).

## **2.5 Water, Sanitation and Hygiene**

The World Health Organization estimates that 50% of under nutrition is associated with repeated diarrhoea and intestinal worm infections as a result of unsafe water, inadequate sanitation as well as insufficient hygiene (WHO, 2008). Diarrhoea and parasitic infections are known to be largely caused by poor water, sanitation and hygiene, and are also the leading cause of death in children below five years of age globally (Liu *et al.*, 2012) and it



is constant incidence in low-income countries which contribute significantly to under-nutrition. Generally, a third of all child deaths are attributable to nutrition-related factors such as low birth weight, stunting and severe wasting all of which are closely linked to a lack of access to water and particularly sanitation and hygiene (DeOnis *et al.*, 2012). Similarly, positive association between improved sanitation and enhancement of child linear growth has been reported (Checkley *et al.*, 2004; Rah *et al.*, 2015).



## **CHAPTER THREE**

### **3.0 METHODOLOGY**

This study consists of two phases. The first phase was development of a care assessment tool (Care Score Index) and the second phase was assessing the quality of care practices in the study area using the developed tool.

#### **3.1 Development of Care Score Index for Assessing the Quality of Child Care in Households**

In order to assess quality of care practices in households, child Care Score Index was developed with respect to various care parameters. The care parameters included maternal health seeking practices, infant and young child feeding practices, child health and immunization, psychosocial and hygiene practices.

The steps used in the development of the Care Score Index followed the procedure for constructing composite indices by Mazziotta and Pareto (2012). The process emphasizes giving a clear sense of what is going to be measured by the index, and refers to a theoretical framework of the underlying factors. The whole process involved two main methods namely literature searching and experts' consultation. The exercise took place between August 2018 and January 2019.

##### **3.1.1 Literature searching**

Literature searching was conducted primarily to identify various indicators related to child care practices that can be included in the tool. Shortlist of potentially relevant indicators for each parameter was compiled from different journals, articles, reports and books. The

selection was done based on the significance of the indicators in relation to child's age group. Scores were assigned according to weight of the indicator, anticipated impact of the indicator to child growth and development as well as age of the child (Mazziotta and Pareto, 2013).

Indicators were rated on a score of 0 to 3 points (3 being the best practice) based on the criteria of formal selection of indicators for composite index by Profit *et al.* (2011).

The criteria include five aspects of consideration as following:

- Importance – Does the indicator have a high priority or high impact in child care practice?
- Reliability – Is the indicator accurately defined?
- Validity – Does the indicator identify the true impact on a specific parameter?
- Scientific soundness – Does the indicator evidenced in the literature, suggesting that it has a contribution for quality of care?
- Usability – Does the indicator provide information that is actionable and can it be used to improve quality of child care?

One of the main challenges in constructing a Care Score Index (tool) was selection of relevant indicators to be included and the availability of required information.

### **3.1.2 Expert consultation**

A total of 12 experts in child health and nutrition were consulted based on peer recommendations, availability and willingness to participate. They comprised of experienced child health and nutrition researchers and practitioners. Three nutrition

researchers were from the Department of Food Technology, Nutrition and Consumer Sciences at the Sokoine University of Agriculture (SUA). Four nutrition experts, were both researchers and practitioners, were contacted from the Tanzania Food and Nutrition Centre (TFNC) and one from the Ministry of Health, Community Development, Gender Elderly and Children. One nutrition practitioner was from UNICEF at the country office in Dar es Salaam. Three District Nutrition Officers from Bukoba, Geita and Temeke districts were also consulted.

The major responsibility of each expert was to review and comment on the suggested indicators, including weights of each indicator. This served as a way of validating the indicators for the developed index. They also suggested other indicators to be added or modified. Each expert was provided with the description of the research problem and objectives of the study, suggested indicators for care quality assessment compiled from the literature and suggested weights for scoring each parameter.

In the first round of ratings, individual experts rated the scores differently some suggesting 4 points while others suggesting 2 points to be appropriate. It was therefore necessary to seek consensus of the experts. Individual meetings with the experts were called for, some of them face to face while others were only possible through phone calls.

Then experts came to an agreement to re-rate the indicators with different range of points. It was agreed to use 3 as the best practice, and 0 as a potentially harmful practice in maternal health seeking practices and infant and young child feeding practices parameters. On the other hand, it was agreed to use 2 points scoring in the psychosocial and hygiene practices whereby 2 is the best practice and zero to reflect a potentially harmful practice.

### 3.1.3 Parameters for Child Care Score Index

Five parameters were agreed for inclusion in the child Care Score Index. This included

- Health seeking practices of the mother,
- Child immunization,
- Child feeding practices,
- Psychosocial practices and
- Hygiene practices.

#### (i) Health seeking practices

Health seeking behaviour during pregnancy has been found to have significant repercussions on the subject's wellbeing and that of unborn child (Britto *et al.*, 2017). For example, the risk of poor pregnancy outcomes and maternal death is higher among women who do not receive antenatal care (Linard *et al.*, 2018). In many developing countries, women do not attend antenatal care clinics regularly thus missing out on important components of prenatal care including health education, screening and diagnosis, treatment and referral services (Ochako and Gichuhi, 2016). The suggested health seeking practices in the Care Score Index (Table 1) include the key components as recommended by WHO (2016) for improving quality of antenatal care. A minimum of eight re-visits are recommended to reduce prenatal mortality and improve women's practices of care during pregnancy (Tuncalp *et al.*, 2017). Other components include intake of daily oral iron and folic acid supplementation for preventing maternal anaemia during pregnancy, low birth weight, preterm birth and other birth defects (Ziaei *et al.*, 2016).

**Table 1: Variables and scoring patterns for health seeking practices of the mother**

<b>Variables</b>	<b>Score</b>
Attendance to antenatal care (ANC) services	Yes → 1 No → 0
Time when visited ANC for the first time	First 3 months → 2 Second and third trimester → 1 Only on the delivery days/did not attend → 0
Frequency of visiting ANC	More than three times → 3 Thrice → 2 Once /Twice/None → 0
<b>Frequency of visit in each trimester (1<sup>st</sup> trimester t/2nd trimester visit /3rd trimester visit)</b>	More than three times → 3 Thrice → 2 Once, Twice, None → 0
Took iron and folic acid tablets or syrup	Yes → 1 No → 0
Duration of taking Iron -folate supplement	Days 180-270 → 3 Days 30-179 → 2 Less than 30 days → 0
Took de-worming tablets	Yes → 1 No → 0

Received malaria tablets	Yes → 1 No → 0
Received Tetanus immunization	Full dose → 2 Partial dose → 1 None → 0
Place of delivery	Health facility → 3 Home → 0
Received Vitamin A (within 2 months of delivery) Not received	Yes → 3 No → 0
Received nutrition education and information/counseling Did not receive nutrition education/ information/ counseling	Yes → 3 No → 0

## (ii) Child health and immunization

Immunization in the form of vaccination is one of the most successful and cost-effective public health interventions (WHO, 2013). All the vaccinations recommended by WHO for under-five children against preventable diseases such as BCG, DPT3, Polio and Measles were included in the Care Score Index. For a child to be considered full immunized has to receive BCG, DPT3, Polio and Measles vaccinations as well as Vitamin A supplement and de-worming in relation to their age. If a child failed to complete all the vaccinations was considered as partially immunized while if a child did not receive any of the vaccination was considered to have not been immunized (Rahman and Obaida, 2010). Underage children were considered to be fully immunized in terms of scores. Table 2 shows the variables that were considered.

**Table 2: Variables and scoring patterns for child health and immunization**

<b>Variables</b>	<b>Score</b>
Visited RCH for child growth monitoring relation to age	Yes → 2 Only partially → 1 No → 0
Vaccination Card	Available → 2 Not available → 0
Received BCG	Yes → 2 No → 0
<b>Received DPT3 [“Pepopunda”]</b>	Yes → 2 No → 0



<b>Received OPV3 [“Matone ya kuzuia ugonjwa wa kupooza”]</b>	Yes → 2 No → 0
<b>Received Measles [“Surua”]</b>	Yes → 2 Underage → 2 No → 0
Received vitamin A capsule [supplement, age above 9 month]	Yes → 2 Underage → 2 No → 0
Received de-worming drug in the last six months	Yes → 2 Underage → 2 No → 0
Child got ill in the last month	Yes → 0 No → 2
Was a sick child sent for medical checkup/treatment	Yes → 1 No → 0
Use of mosquito net	All the time → 2 Sometimes → 1 Don't own mosquito net → 0
<b>Maintaining the amount of food (for a sick child).</b>	More than usual → 2 About the same → 1 Less → 0

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### **(iii) Child feeding practices**

Every infant and child has the right to good nutrition according to the Convention of the Rights of the Child (Cohen, 2017). Infant and young child feeding is a key area to improve child survival and promote healthy growth and development (Taghizade *et al.*, 2015). Optimal nutrition during the first two years of child's life lowers morbidity and mortality, reduces the risk of chronic diseases, and fosters overall better development (WHO, 2017).

Child feeding, which incorporates breastfeeding and complementary feeding practices, involves various dimensions like the type, quantity, consistency, energy and nutrient density, the frequency of feeding and the diversity of the diet. These various dimensions are difficult to combine into one indicator. Most research on feeding practices has focused on only one or two at a time (Huffman, Zehner and Victora 2001; Brown *et al.* 2002;

Arimond and Ruel, 2003). This has resulted in fragmented information, and it has prevented progress in understanding the association between overall feeding patterns and child health and nutrition outcomes. Therefore, the proposed Care Score Index has included three core indicators recommended by WHO (2015), namely: -

- Early initiation of breastfeeding within one hour of delivery,
- Exclusive breastfeeding in the first six months and continued breastfeeding up to two year of age and above and
- Introduction of solid and semi-solid or soft foods from six months with reasonable dietary diversity.

Table 3 shows the different variables included in the index for the child feeding practices and the suggested scoring pattern.

**Table 3: Variables and scoring pattern for feeding practices**

Variables	Score
Ever breastfeed	Yes → 2 No → 0
Initiation of breastfeeding after delivery	Within one hour → 3 One to three hours → 2 More than three hours → 0
Use of pro lacteal	Yes → -1 No → 2
Breastfeeding on demand	On demand (anytime) → 3 After every regulated time → 1 Only when the mother is round or feel like doing it → 0
Timely initiation of complementary food	6month → 3 7-8 month → 2 4-5month → 1
Duration of breastfeeding	Less than 4 months → 0 2 years and beyond → 3 Between 1 and below 2 years → 2 Less than 1year → 1

Food consistency	<p><b>6 to 11months of age</b> Semi solid → 2 Semi liquid → 1</p> <p><b>12-24month and above 24months of age</b> Solid → 2 Semi Solid → 1</p>
Dietary diversity- (number of food groups consumed in the past 24hrs)	<p><b>6-11months of age</b> 0-2 → 0 3-4 → 2 5-7 → 3</p> <p><b>12 -24 months of age</b> 0-2 → 0 3-4 → 1 5-7 → 3</p> <p><b>Above 24months of age</b> 0-2 → 0 3-4 → 1 5-7 → 2</p>
Provided with a special meal	<p><b>24months of age and below</b> Eats special meal → 3 Eats family meal → 1</p> <p><b>Above24 months of age</b> Eats special meal → 2 Eats family meal → 1</p>
Meal frequency per day	<p><b>6-11 months of age</b> Less than two meals → 1 Above three meals → 3</p> <p><b>12 -24 months of age</b> less than two meals → 0 Above three meals 3 → 2</p> <p><b>Above 24months of age</b> less than two meals → 0 Above three meals 3 → 2</p>

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**(iv) Psychosocial practices**

The quality of early infant-caregiver interactions determines the path of an infant's social, cognitive and emotional development (Engle *et al.*, 2007). Children whose care is disturbed or distorted in some ways, are at risk of being stressed, not growing well, not being psychologically stimulated and develop malnutrition (WHO, 2004). Warm and responsive care giving is now known to extend some protection to children in otherwise adverse situations (Crandall *et al.*, 2015).

Early childhood is a critical period for language and cognitive development. Whereby, a language-rich interaction with caregivers is important for optimal language and cognitive development (Zauche *et al.*, 2016). Thus the suggested Care Score Index involves elements that influence language, which include talking, interacting, reading and drawing pictures in early childhood. Additionally, other elements have been included such as playing and communicating with a child and feeding interaction (Lucas *et al.*, 2018). They all play a key role in physical, cognitive and social development. Table 4 shows the suggested variables and the pattern of scoring.

**Table 4: Variables and scoring pattern for psychosocial practices**

<b>Variables</b>	<b>Score</b>
Caregiver Sitting with a child during mealtime	<b>6-11months of age</b>
	With caregiver only → 2
	With caregiver and sibling → 1
	<b>12-24months of age</b>
	With family members → 1
	With caregiver → 2
	Alone → 0
	<b>24-36months of age</b>
	Alone → 1
	With family member → 1

	With caregiver → 2
	<b>36-59months of age</b>
	Alone → 2
	With family member 2
Child eating place during meal time	Table or mats → 2
	Bare ground /floors → 0
Child meal served	<b>6-11 months of age</b>
	Separately → 2
	Along with family → 0
	<b>12-24months of age</b>
	separately → 2
	Along with family → 0
	<b>24-36months of age</b>
	Along with family → 1
	Separately → 2
	<b>Above 36months of age</b>
	Separately → 1
	Along with family → 1
Sensitivity to child need (voice reaction)	Tone depends on the manner → 1
	Friendly tone → 2
	Raised voice → 0
Holding/using feeding tools	<b>12month-24months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
	<b>25-36months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
	<b>37- 59months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
Supporting a child when start to : Sit, crawl, stand up with object, stand upalone, talk, run ..	providing supporting material/ensuring environment safety → 2
	No support is provided → 0
Child's activities	<b>12-24months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	<b>25-36months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	reading/writing → 2
	<b>37-59months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	reading/writing → 2

---

## (v) Hygiene practices

Clean water, basic toilet and good hygiene practices are essential for the survival and development of children (WHO and UNICEF, 2015). Key hygiene practices for WASH action include use of improved latrines by the whole household all the time, the washing of

hands with soap at critical moments and use and safe storage of drinking water. These were included in the proposed Care Score Index, together with food preparation and storage, and domestic and environmental hygiene. Each indicator was scored as either 0 or 2 points, with 2 representing the most suitable behaviour. Table 5 shows the proposed variables.

**Table 5: Variables and scoring for hygiene practices**

<b>Variables</b>	<b>score</b>
Area for food preparation	Kitchen → 2 Non kitchen area (eg open area) → 0
Food storage	Refrigerator/sealed-containers/hotpots/thermos flask → 2 None of the above → 0
Household toilet facility	Pit latrine/flush type → 2 No facility → 0
Child toilet facility	Sitting pot/dippers → 2 Open area/others → 0
Child's solid and liquid wastes disposal	Garbage pit/bury/burn → 2 Thrown in the surrounding environment → 0
Available source of water	Piped water → 2 Protected well/surface water/rain water → 1
Water safety (treatment)	Treatment/boil → 2 No treatment → 0
Hand wash	After or before critical moments → 2 Don't wash → 0
Use of detergent for washing hands	Soap/Sanitizer → 2 None → 0

### **3.2 Assessment of Quality of Care**

The second phase used the developed tool to assess the quality of care in a selected study area. The selected study area was Temeke Municipality in Dar es Salaam. The area was selected due to its nature of having urban and rural characteristics blended together.

#### **3.2.1 Description of the study area**

Temeke Municipality with area coverage of 786 square km is the largest in terms of land size among the other Municipalities in Dar es Salaam. The population growth rate of

Temeke Municipality is 6.6% per year during census 2012 (NBS,2012). It has the total population of 1,368,881 million 2012 persons, whereby 669,056 are male and 699,825 are female of which children of 0 to 9 years are 317,987 (NBS, 2012).

Residents in Temeke district are of different ethnic origins because of its urban and peri-urban nature. Originally, the main ethnic groups residing in Temeke Municipality included the Ndengereko, Makonde and Zaramo. Main economic activities in Temeke include petty trading, wage employment and business. A small proportion of people practice farming.

### **3.2.2 Study design**

A cross - sectional design was used in this study, whereby data were collected from the field at a single point in time from a representative sample of the population. This design, according to Armitage and Matthews (2008), is known to be useful for descriptive purposes as well as for determination of the relationship between and among variables at a particular point in time.

#### **3.2.2.1 Study population and sampling procedure**

The study population comprised of mothers of children below five years of age together with their children. Wards that are known to have strong peri-urban characteristics were listed and simple random sampling was used to obtain four wards namely Sandali, Makangarawe, Mtoni and Kilakala (Figure 1). Community leaders were instrumental in identifying households with children of less than five years of age. A complete list of such households was compiled to form the sampling frame. Random selection using the table of random numbers was used to obtain the required sample in each of the four wards.

### 3.2.2.2 Sample size

According to Fisher's formula (Gorman et al., 1995) the sample size to be used was 198.

The procedure for calculating the sample size was as shown: -

$$N = \frac{Z^2 - p(1-p)}{e^2}$$

Where  $p$  is the estimated variability of attribute of interest in the population = 15.2 (Percent distribution of the de facto population of children under the age of five years a group (TDHS-2015-16)

$e$  is the precision level =5%

Z confidence interval at 95% =1.96

N= Sample size

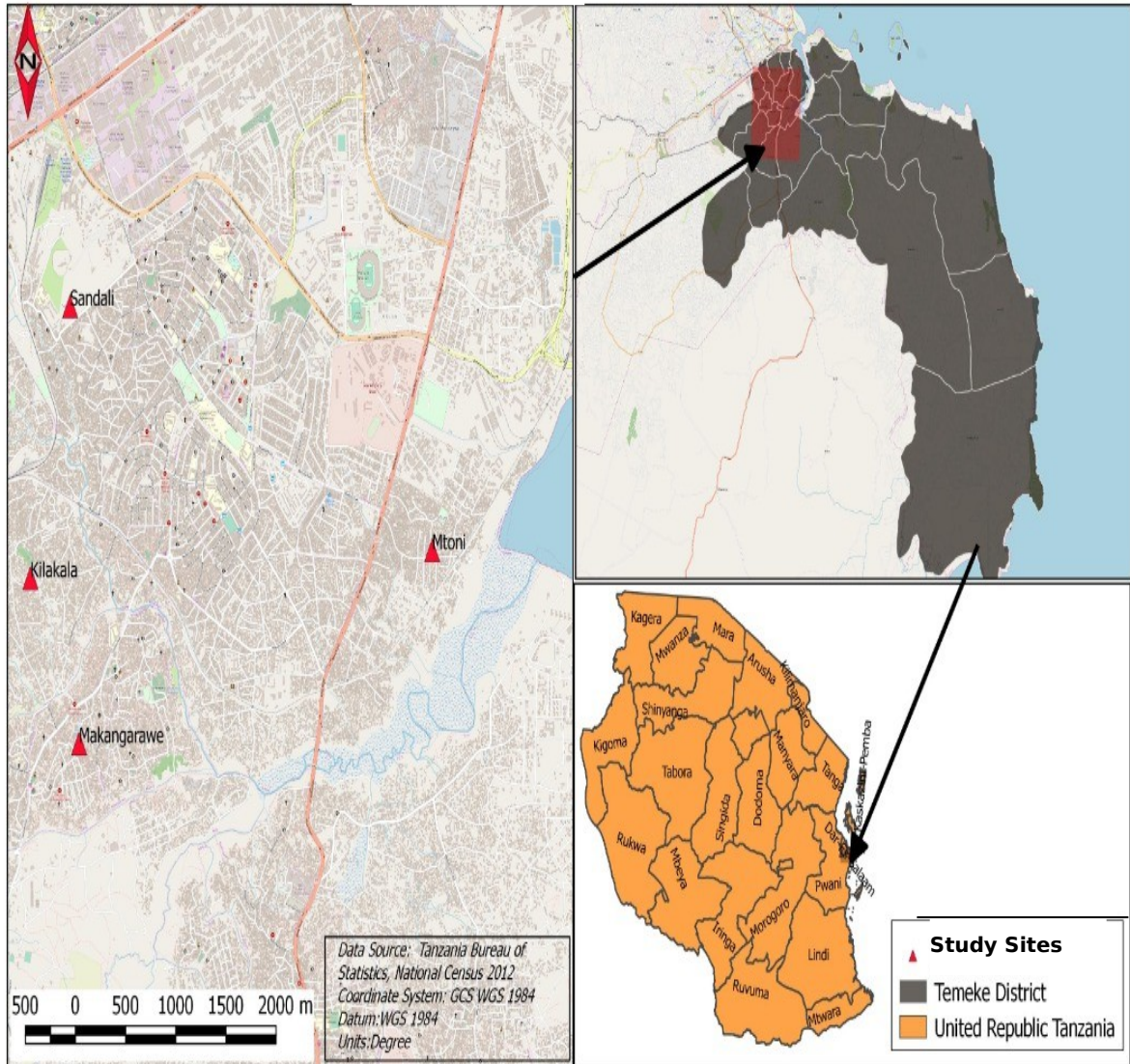
$$N = \frac{(1.96)^2(0.152*0.848)}{(0.05*0.05)}$$

N=198.06

Sample size =198



## STUDY SITES



**Figure 1: Map showing Location of Study Area in Temeke Municipality**

**Source: Tanzania Bureau of Statistics, National Census 2012**

### 3.2.3 Data Collection

#### 3.2.3.1 Assessment of quality of child care

A questionnaire (Appendix 1) comprising of the developed Care Score Index was used to collect information from mothers of children. The information sought included health

seeking practices, child immunization, child feeding practices and psychosocial practices as well as hygiene practices. Interviews were conducted by a trained individual.

### **3.2.3.2 Assessment of nutritional status**

Anthropometric measurements were used to assess the nutritional status of children, whereby weight and length were recorded using standard procedures (Cogill, 2003). Weight was recorded for children using the UNICEF Electronic scale-Seca Model. Children were weighed with light clothing and with no shoes to minimize error. For children below two years, weight measurement was taken by requesting the mother to stand upright on the measuring scale then the scale was tared to zero and the child was handled to her mother so that the weight of the baby can be recorded. All the measurements were recorded in duplicate to the nearest 0.1 gram.

Heights /recumbent lengths were measured using height boards (stadiometer). An infant was positioned so that his /her head lay against the top stop and the foot stop was moved to meet the infants' feet while gently holding the infants' knees down on the length board. Children above two years of age were asked to stand upright on the base of the stadiometer with the back and shoulder touching the vertical backboard and ankles touching the base of the vertical backboard. Measurements were recorded to the nearest 0.1cm. Length was measured in duplicate by the same enumerator to minimize inter examiner error.

### **3.2.4 Data analysis**

A study database was compiled and imported into IBM SPSS Statistics for windows (version 20.0 IBM) for analysis. Anthropometric data were analysed using WHO Anthro software version 3.2.2 (Anthro, WHO, Geneva). Three indicators commonly used in assessing the nutritional status of children were computed. They included weight-for-age z-

score (WAZ), which reflects both the past chronic and present acute under nutrition (underweight), Height-for-age z-score (HAZ) which reflects chronic under nutrition (stunting); and weight-for-height z-score (WLZ) which reflects acute under nutrition (wasting). Stunting, underweight and wasting were defined as z-score below -2 standard deviation of mean value.

Descriptive statistics were generated for each variable. Independent T-test and chi-square test were used respectively to test for mean score differences and relationship between and among variables.

#### **3.2.4.1 Child care score**

General individual component scores were summed up for each child and a total score was obtained. According to the setting, the scores would vary from the minimum of 0 to the maximum of 107 points. The scores were classified as category one if the total score was above 73 points, and category two if the total score was 73 points and below. Category one implies a better child care practices while category two reflected inferior care practices. The idea of score categorization was adopted from Garg and Chadha (2009) on developing index for measuring the quality of complementary feeding practices in rural India and from Rios et al. (2016) on developing dietary quality score for infants and toddlers.

#### **3.2.5 Ethical consideration**

Permission to conduct the study was obtained from Sokoine University of Agriculture and the office of Temeke Municipal Director. Respondents were informed about the study and invited to participate. The purpose and nature of the study were explained and those who

agreed to participate gave their verbal consent. Assurance was made to the respondents that participation was voluntary and that confidentiality for the information provided will be ensured.

## **CHAPTER FOUR**

### **4.0 RESULTS**

Results of the assessment of quality of care given to children of below five years of age are presented in this chapter. The chapter consists of two main sections. The first section shows the characteristics of the study respondents while the second section reveals the findings of quality of care as assessed by the developed tool (the Care Score Index).

#### **4.1 Characteristics of the Study Respondents**

Five aspects of the characteristics of study respondents are presented in this section. They include:

- Socio demographic characteristics of the sampled mother and children
- Health seeking practices of mothers (including child immunization)
- Child feeding practices
- Psychosocial practices
- Hygiene practices

##### **4.1.1 Socio-demographic characteristics of mothers and children**

The socio-demographic characteristics of the mothers considered in this study include: mother's age, marital status, education level, occupation and number of children. Other

socio-demographic characteristics of interest included child's age in months, sex and birth weight. Table 6 shows the results of the named socio-demographic characteristics.

#### **4.1.1.1 Age of the mother**

The age of the mothers ranged from 18 to 52 years with a mean age of 28.33 years and standard deviation of 5.98 years. Table 6 illustrate distribution of mothers by age.

#### **4.1.1.2 Marital status, education level, occupation and number of children**

Majority (81%) of the study mothers were married while 19% were single/divorced/separated or widowed (Table 6). Education levels of the respondents showed that 63% of the mothers had attained only primary school education while 27% had attained secondary school education. On the other hand, 6% had gone to college and 4% were secondary school drop-outs. About a half (51%) of the respondents were unemployed and housewives while 40% were self-employed operating small businesses and 9% were employed (Table 6). Forty-three percent of the study mothers had only one child, 32% had two children and 25% had more than two children (Table 6).

#### **4.1.1.3 Child's sex, age and birth weight**

The proportion of male children was 53% while that of female was 47% (Table 6). Children aged 6-23 months were 63% while those aged 24-36 months were 14% and 37-59months were 23%. Twelve percent of the children were born with weights below the normal weight of 2.5 kg. The rest (88%) were born with 2.5kg and above.

**Table 6: Socio Demographic Characteristics of Mothers and Children**

Characteristic	No. of respondents	%
<b>Child age categories</b>		
6-23months	125	63.3
24-36months	27	13.6
37-59months	46	23.1
<b>Child sex</b>		
Male	105	53
Female	93	47
<b>Child birth weight categories</b>		
Below 2.5kg	24	12
2.5kg and above	174	88
<b>Mothers age</b>		
15-20yrs	11	5
21-35yrs	160	81
36-45yrs	25	13
Above 45 yrs	2	1
<b>Education level attained</b>		
Primary school level	124	63
Drop out secondary school level	9	4
Secondary school level	54	27
University/college	11	6
<b>Marital status</b>		
Married	160	81
Single mothers	30	15
Divorced/widow	8	4
<b>Occupation</b>		
Employed	18	9
Self employed	79	40
House wife	101	51
<b>Number of children</b>		
One	84	43
Two	64	32
More than two	50	25

#### 4.1.2 Health seeking practices of mothers and child health immunization

Health seeking practices of mothers included the following aspects: attendance to ANC clinics and intakes of iron folic acid tablets, vitamin A supplement, de-worming and use of

anti- malarial. Others were child immunization status, use of mosquito nets and child illness and diarrhoea treatment.

#### **4.1.2.1 ANC Attendance**

Majority of mothers (97%) attended ANC clinics during pregnancy, and only 3% reported to have not attended (Table 7). Eighty percent visited ANC clinics for more than three times, 10% visited three times only, while 6% visited for only once or twice and only 4% didn't visit ANC (Table 7).

#### **4.1.2.2 Use of iron folate tablets, de-worming drugs, anti- malaria and vitamin A supplements**

Eighty-nine percent of mothers received iron folate supplement during pregnancy (Table 7), while 84% received de-worming drugs and 86% took anti- malaria tablets. On the other hand, 75% of the mothers did not get vitamin A supplement after delivery. Seventy-nine percent of the study mothers reported to have received nutrition related information regarding breastfeeding and complementary feeding. However, 21% reported to have received none of the information (Table 7).

**Table 7: Distribution of the sampled mothers according to their maternal health seeking practices**

<b>Variables</b>	<b>N</b>	<b>%</b>
Attended ANC clinics	192	97
ANC frequency Visit		
More than three times	159	80
Three times	19	10
Once/Twice	12	6
None Visit	8	4
Received Iron-Folic acid Tablets	177	89
Received De-worming Tablets	167	84

Received anti-Malaria Tablets	117	86
Birth Place		
Health facility	193	97
Home	5	3
Received Vitamin A after delivery		
Yes	49	25
No	149	75
Receiving of information about nutrition		
Yes	157	79
No	41	21

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#### **4.1.2.3 Child immunization**

Almost all of the study children (99%) were taken to RCH for regular growth monitoring and received all vaccinations appropriate to their age (BCG, DPT, OPV, Measles and vitamin A). Table 8 shows the summary of child immunization status. Only 18% of the children did not receive de-worming tablets.

#### **4.1.2.4 Child illness, diarrhoea treatment and use of mosquito nets**

Fifty-five percent (55%) of mothers reported their children had not suffered from any illness in the past one month prior to the survey (Table 8). Fifteen percent (15%) of children had diarrhoea, 14% had cough problems, 12% had malaria and 4% had urinary tract infection. For the children with diarrhoea, parents reported the treatment given to include, ORS fluids (34%) and antibiotics (66%). Sixty eight percent of the respondents reported that their children were using insecticide treated mosquito bed nets all the time while 31% reported using insecticide treated nets during night time only and 1% did not own mosquito nets (Table 8).



**Table 8: Distribution of the sampled children according to their immunization status**

<b>Variables</b>	<b>n</b>	<b>%</b>
Attended RCH for child monitoring	197	99
Received DPT3 Vaccine	198	100
Received OPV3 Vaccine	198	100
Received Measles	161	99
Received Vitamin A supplement	160	96
Received De-worming tablets	115	82
<b>Child Illness in the past month</b>		
No any disease suffered	109	55
Diarrhea	29	15
Cough	27	14
Malaria	24	12
Urinary Tract infection	9	4
<b>Sick children (n=89)</b>		
Taken for medical treatment/check-up	85	94
Not taken for medical care	4	6
<b>Children with diarrhea (n=29)</b>		
Given ORS fluid as treatment	10	34
Given antibiotics (syrup or tablets) as treatment	19	66
<b>Use of Mosquito bed nets</b>		

Use all the time	135	68
Use at night only	61	31
Don't own Mosquito net	2	1

### **4.1.3 Child feeding practices**

Child feeding practices included breastfeeding and complementary feeding practices by age groups and dietary diversity and meal frequency.

#### **4.1.3.1 Breast feeding and complementary feeding practices by age groups**

Results in Table 9 indicate that 46.2% of children aged 6-8months were breastfed one hour after birth. This was similar to 62.9% and 43.9% of children 9-11 months and 12-24 months, respectively. On the other hand, children aged 12-24 months and 25-36 months showed to have higher proportions (22.7% and 32% respectively) of receiving prolactal feeds right after birth compared to other age groups. Sixty-nine percent of children aged 6-8 months were timely introduced to complementary foods at 6 months. Also it was 65.7% and 53% of children aged 9-11 months and 12-24 months respectively. Almost two thirds (65.2%) of the 37-59 months old children continued to be breastfed after two years compared to only 28% of the 25-36 months' children (Table 9).

#### **4.1.3.2 Minimum dietary diversity and meal frequency**

Results in Table 9 shows that moderate dietary diversity score was dominant for all the age groups of children ranging from 50% to 71.7%. Children aged 6-8 month had a higher percentage of low dietary diversity score (42.3%) compared to other age groups. For each age group, frequency of meal of more than three times was predominant compared to less than three times.

**Table 9: Distribution of sampled children according to their feeding practices by age group (months)**

	6 -8 mo (n=26) %	9-11 mo (n=35) %	12-24 mo (n=66) %	25-36 mo (n=25) %	37-59 mo (n=46) %
Initiated breastfeeding within one hour after delivery	46.2	62.9	43.9	36	41.5
Was given prolactal	7.7	11.4	22.7	32	8.7
Was timely initiated with complementary foods at 6months	69.2	65.7	53	36	43.5
Continued breastfeeding after two years of age				28	65.2
<u>Meal frequency:</u>					
- Less than three times	46.2	45.7	50	20	13
- Three or more times	53.8	54.3	50	80	87
<u>Dietary diversity score (DDS):</u>					
- Low DDS (1-2 food groups)	42.3	28.6	21.2	12	15.2
- Moderate DDS (3-4 food groups)	50	57.1	62.1	60	71.7
- High DDS (5-7 food groups)	7.7	14.3	16.7	28	13.1

Key: mo = months

#### 4.1.4 Psychosocial practices

Psychosocial practices included child feeding preference, sensitivity to child's needs and physical and cognitive development.

##### 4.1.4.1 Feeding preference

The results show that 65% of children 6-8 months were sitting with caregivers during meal time (Table 10). This was 97% for the 9-11 months old, 82% of 12-24 months, 48% of children 25-36 months and 20% of children above 36 months. Also the results show that majority of the children in each age group were served food separately.

##### 4.1.4.2 Sensitivity to child's needs

Results in Table 10 show that most of the respondents were using friendly tone when addressing child's needs. The highest proportion was 86.7% for 6-8 months and the lowest was 58.3% for children aged 25-36 months.

##### 4.1.4.3 Physical and cognitive development

Results in Table 10 shows that all the children above 36 months (100%) were able to use their hands to hold a cup or spoon for feeding themselves. This was 96% of the 25-36 months and only 64% for those of 12-24 months old.

Results also show that 75.8 % of children 12-24 months old were active in playing games and drawing compared to 44% of 25-36 months and 32.6% of the 37-59 months. Reading and writing was more common among the 37-59 months' children (43.5%).

**Table 10: Distribution of sampled children according to their psychosocial practices**

	6-8 mo (n=26)	9-11 mo (n= 35)	12-24 mo (n=66)	25-36 mo (n=25)	37-59 mo (n=46)
	%	%	%	%	%
<b>Caregiver-child interaction</b>					
Sitting with a child during mealtime	65	97	82	48	20

Child meal served Separately	100	97.1	95	92	67
Use of friendly tone	86.7	75.8	68.2	58.3	63
<b>Physical and cognitive development</b>					
Holding feeding tools	-	-	64	96	100
Staying alone	-	-	21.2	44	23.9
Drawing/playing	-	-	75.8	44	32.6
Reading/writing	-	-	-	4	43.5

#### 4.1.5 Hygiene practices

Hygiene practices involved child's food preparation, household water source, treatment of drinking water, sanitation, presence of toilet /latrine in the household and disposal of refuse. Results are summarized in Table 11.

##### 4.1.5.1 Food preparations

Seventy-two percent of the respondents reported to prepare child's food in the kitchen while 28% prepared it on an open area. On the other hand, 94% store the child's food in hotpots or sealed containers and only 6% store in open pots or unsealed containers (Table 11).

##### 4.1.5.2 Household water source and water treatment

The main source of household water supply in the study area was piped water (87%) while about 13% reported to use surface water. Only about half (51.1%) of respondents were treating drinking water through boiling and using chemical treatment (water guard). On the other hand, about 85% reported to wash their hands using water and soap (Table 11).

##### 4.1.5.3 Toilet facility and waste disposal

All (100%) of the sampled households used ordinary pit latrines for human excreta disposal, and for young children (who cannot use normal toilets), 96% reported to use sitting baby pots or dippers. More than eighty-five percent (87.8%) of the respondents

reported that they disposed the waste by burning, burying or disposing in pit latrines (Table 11).

**Table 11: Distribution of sampled households according to their hygiene practices**

Hygiene practices	N	%
Use kitchen to prepare child's food	143	72
Use hotpot/sealed containers to store child's food	187	94
Have toilets (Pit latrine/flush type)in the household	198	100
Use toilet facility(sitting pot/Dippers) for the child	167	96
Dispose waste safely (garbage pit/bury/burn)	174	87.8
Water source for households		
- Piped water/Rain water collection	173	87.3
- Surface water/ Protected well	25	12.7
Treating drinking water(Boil/Water guard/ Use water filter)	102	51.5
Wash hands with water and soap(bar, liquid, sanitizer)	168	84.8

## 4.2 Results on Care Score Index

A score index was developed to serve as a quick tool to get a composite score of main child care practices for defining the quality of care practices given to children. The scoring system and format have been described in chapter 3.

### 4.2.1 Overall care score

Scores vary from the minimum of 0 to the maximum of 107 points. The scores were classified as category one if the total score was above 73 points, and category two if the total score was 73 points and below. Accordingly, category one implies a better care quality than category two. In each parameter category one defines the points above middle point from the total point in each parameter.

Results in Table 12 show that 75.8% of children were in category one and 24.2 % were in category two.

**Table 12: Distribution of respondents in overall care score categories**

Category of Care score	No. of respondents	Percentage
Category One	150	75.8
Category Two	48	24.2

Total	198	100
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*Category one refers to points above 73 score points and category two refers to 73 points and below.*

#### 4.2.2 Scores in each individual care component

Apart from assessing the overall care score in section 4.2.1, attempt was also made to present the scores for each component. The components are namely maternal health seeking practices, child immunization, child feeding practices, psychosocial care practices and hygiene practices.

##### 4.2.2.1 Maternal health seeking practices

The maximum score on maternal health practices was 26 points and minimum score was 0. The scores range was categorized in two groups namely category one for above 15 points and category two for 15 points and below. Results in Table 13 show that 30.3% of mothers were in category one while 69.7% fell in category two.

**Table 13: Distribution of respondents according to their scores in maternal health seeking practices**

Scores category	No. of respondents	Percentage
Category one	60	30.3
Category two	138	69.7
Total	198	100

*Category one refers to points above 15 and category two refers to 15 points and below*

##### 4.2.2.2 Child immunization practices

The maximum score on child immunization practices was 23 points, and were grouped in two categories. Category one included children who scored above 11 points and category two was for children with 11 points and below. Majority of children (99%) fell in category one (Table 14) while only one percent appears in category two.

**Table 14: Distribution of respondents according to their scores in child immunization care practices**

Scores category	No of respondents	Percentage
Category one	196	99
Category two	2	1

Total	198	100
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*Category one refers to points above 11 and category two points 11 and below*

#### 4.2.2.3 Child feeding practices

In feeding practices, the assessments basically focused on breastfeeding and complementary feeding patterns. Maximum score on feeding practices was 27 points and minimum score was -1(minus one). Feeding practices scores were classified into two categories. Children who had scores above 12 points were classified as category one and the ones who had 12 points and below were classified as category two. Majority of children (93.4%) were under category one and only 6.6% fell in category two (Table 15).

**Table 15: Distribution of respondents according to their scores in feeding practices**

Scores category	No. of respondents	Percentage
Category one	185	93.4
Category two	13	6.6
Total	198	100

*Category one refers to points above 12 and category two points 12 and below*

#### 4.2.2.4 Psychosocial practices

Psychosocial practices had a maximum of 13points and minimum of 0. Points were classified into two categories, one with points above 6 and the other one with 6 points and below. Results in Table16 show that 93.4% of children fell in category one and only few are in category two.

**Table 16: Distribution of respondents according to scores in psychosocial care practices**

Scores category	No. of respondents	Percentage
Category one	185	93.4
Category two	13	6.6
Total	198	100

*Category one refers to scores above 6 points and category two 6points and below*



#### 4.2.2.5 Hygiene practices

A maximum score point on hygiene practices was 18 and 0 was a minimum score. The points were classified into two categories. Category one refers to scores of above 8 points and category two refers to 8 points and below. Results in Table 17 show that majority of respondent (97%) had scores in category one and only 3% of respondents fell in category two.

**Table 17: Distribution of respondents according to their scores in hygiene practices**

Scores category	No. of respondents	Percentage
Category one	192	97
Category two	6	3
Total	198	100

*Category one refers to points above 8 and category two points 8 and below*

#### 4.3 Child Nutritional status

Results in Table 18 show the distribution of stunted, underweight and wasted children. The finding shows that 15.2% were stunted while 8.6% were underweight and 6.6% wasted.

**Table 18: Nutritional status among the study children**

Indicators	No. of respondents	Percentage
<b>Stunting</b>		
Stunting	30	15.2
Not- stunted	168	84.8
Total	198	100
<b>Underweight</b>		
Underweight	17	8.6
Not- underweight	181	91.4
Total	198	100
<b>Wasting</b>		
Wasted	13	6.6
Not –wasted	185	93.4
Total	198	100

#### 4.4 Relationship between Care Score and Nutritional Status

T-test for mean score value of each category of nutritional status were conducted to determine the relationship between quality of care and nutrition outcome. The variables tested included overall care scores as well as the individual components of care quality (that is maternal health seeking score, child immunization score, feeding practices score, psychosocial care score and hygiene practices score).

#### 4.4.1 Overall care score and nutritional status

The findings in Table 19 show that there is a significant difference between the mean care scores of underweight and that of non-underweight (t-value =3.003; p-value =0.003). Children who are not underweight had a higher mean score compared to the children who are underweight (78.1381 as opposed to 72.4706). Stunting and wasting have shown no significant difference in their mean care score values.

**Table 19: T-test results for overall care score and different categories of nutritional status**

Nutritional status	Mean Care Score	t-value	P-value
Stunting Non- stunted	77.6333 77.6548	-0.014	0.989
Underweight Non- underweight	72.4706 78.1381	-3.003	0.003**
Wasting Non- wasted	76.3077 77.7459	-0.660	0.510

\*\*Significant at  $P \leq 0.01$

#### 4.4.2 Maternal health seeking, child immunization and nutritional status

Results in Table 20 show that, there was no significant difference in maternal health seeking behaviour and child immunization and nutritional status.

**Table 20: T-test results for maternal health care score (and child immunization) and different categories of nutritional status**

<b>Nutritional status</b>	<b>Mean Score</b>	<b>t-value</b>	<b>p-value</b>
<b>Maternal health seeking score</b>			
Stunting	14.9000	0.77	0.442
Not stunted	14.2679		
Underweight	12.8824	-1.549	0.123
Not underweight	14.5028		
Wasting	13.6923	-0.604	0.547
Not wasted	14.4108		
<b>Child immunization score</b>			
Stunting	18.4333	-0.897	0.371
Not stunting	18.869		
Underweight	18.1176	-1.208	0.228
Not underweight	18.8674		
Wasting	19.3846	0.885	0.377
Not wasted	18.7623		

#### **4.4.3 Feeding practices score and nutritional status**

Results in Table 21 show that there was a significant difference in mean feeding practice score between underweight and non-underweight children. Children who appeared to be normal had a higher score in feeding practices compared to children who are underweight (t-value =2.651; p-value =0.009). There was also a significant difference between feeding practices care score and wasting (t=2.403; p=0.017), whereby the non-wasted children were better off. However, there was no significant difference between feeding practices score and child stunting (p=0.456).

**Table 21: T-test results for feeding practices care score and different categories of nutritional status**

<b>Nutritional status</b>	<b>Mean score</b>	<b>t- value</b>	<b>P value</b>
<b>Feeding practices score</b>			
Stunting	18.9333	-0.747	0.456
Non- stunted	19.4940		
Underweight	17.1176	-2.651	0.009**
Non- underweight	19.6243		
Wasting	17.0000	-2.403	0.017*
Non- wasted	19.5784		

\* Significant at  $p \leq 0.05$ , \*\* significant at  $P \leq 0.01$

#### 4.4.4 Psychosocial care score and nutritional status

There was no significant difference in the mean care score of psychosocial care practices among the different categories of nutritional status for stunting, underweight and wasting (Table 22).

**Table 22: T-test results for psychosocial care scores and different categories of nutritional status**

<b>Nutritional status</b>	<b>Mean score</b>	<b>t- value</b>	<b>P-value</b>
Stunting	10.0667	1.149	0.252
Non- stunted	9.6488		
Underweight	9.2941	-0.981	0.328
Non- underweight	9.7514		
Wasting	10.1538	0.897	0.371
Non- wasted	9.6811		

#### 4.4.5 Hygiene practices score and nutritional status

Results in Table 23 show that there was no significant difference in mean score of hygiene practices among the different categories of nutritional status at  $p \leq 0.05$ .

**Table 23: T-test results for hygiene care score and different categories of nutritional status**

<b>Nutritional status</b>	<b>Mean score</b>	<b>t-value</b>	<b>P value</b>
Stunting	15.3000	-0.147	0.883
Non-stunted	15.3923		

Underweight	15.0588	-0.512	0.609
Non-underweight	15.3923		
Wasting	16.0769	1.038	0.300
Non-wasted	15.3135		

#### 4.5 Relationship between Quality of Care and Maternal Factors

Chi-square test was used to determine the relationship between the overall care scores and maternal factors which included four variables namely education level, marital status, occupation and number of children. The results in Table 24 indicate that there was no significant relationship between child care categories scores and any of the variables of maternal factors.

**Table 24: Chi-square test results for relationship between overall care scores and maternal socio-demographic characteristics**

Socio-demographic characteristic n=198	Category one (percentage)	Category two (percentage)	P- value (X <sup>2</sup> -value)*
<b>Education level</b>			
Primary level	73.6	26.4	0.214
Secondary/college/university	80	20	(0.948)
<b>Marital status</b>			
Single/widow	84.2	15.8	0.125
Married	73.7	26.3	(1.830)
<b>Occupation</b>			
House wife	73.2	26.8	0.252
Employed and self employed	78.4	21.6	(0.696)
<b>Number of children</b>			
One and two	76.4	23.6	0.436
More than two	74	26	(0.113)

\*number in brackets show the chi-square values.

## CHAPTER FIVE

### 5.0 DISCUSSION

This section presents a discussion of the findings of this study. The discussion is organized according to the research objectives as specified in chapter one.

### **5.1 Care Score Index as a Tool for Assessing Quality of Child Care**

In the present study a Care Score Index was designed which involves four parameters of child care practices namely maternal and child health seeking behaviour, feeding practices, psychosocial and hygiene practices. To our knowledge this is the first attempt to develop a child care score index which includes all the four parameters. There are several indices that have been developed to measure different parameters of child care practices. They include infant and child feeding index (Arimond and Ruel, 2002), diet quality index score for infants and toddlers (Rios *et al.*, 2016) and complementary feeding practices index (Chanda and Garg, 2009). However, the most used nutrition index so far has been the one by FAO which measures under nutrition. Using cumulative ideas from the above indices, the developed tool was constructed to include all the four parameter of child care practices in one single measurement.

Measurement of care practices took into consideration that good and poor practices may occur in the same household (Dettrick *et al.*, 2013), thus need for a composite index that combines various practices to give a single measurement. This can serve as a simple and therefore useful way of assessing health risks of infants and young children in households. Assessing quality of care allows the situation to be known and therefore provide evidence based information to key stakeholders and policy makers which will help to influence policy formation and interventions. The tool can also serve as a valuable tool for health and nutrition research for solving the problems of under nutrition (Townsend, 2006). The development of this Care Score Index has been taken as a first step in formulating a more universal tool to be used for assessing care practices within households in different societies in Tanzania. In that respect, it would be appropriate to widen its coverage to include more varied types of communities. The current situation only focused in a single location with typical urban and peri-urban characteristics.

It may also be necessary to administer the tool more than one time to check its reliability and validity. The index developed by Arimond and Ruel (2002) was administered more than once to check its reliability. Also the duration of recall needs to be harmonized and kept to a reasonable period to minimize memory errors as suggested by Ruel and Menon (2002) for about 12 months or less. In the current tool, mothers had to recall practices up to 36 months and above. Rios *et al.* (2016) indicated that it is difficult for some caregivers to recall the foods and beverages consumed by their infants and the portion sizes of the different foods consumed if the recall is kept long.

## **5.2 Quality of Child Care Practices**

More than three quarters (75.8%) of the respondents were having good practices of overall care scores (category one). This indicates that most of mothers/caregivers are complying with the guidelines and proper care practices to their infants and young children. Considering the individual parameters of care, respondents had a high proportion of scores in category one except for maternal health seeking practices. For example, 75% of mothers reported to have not taken vitamin A supplements after delivery. Vitamin A supplementation in postpartum women is intended to improve maternal vitamin A status, thereby increasing vitamin A content of breast milk and improving the health of mother and infant. However, some evidence suggests that vitamin A supplementation in postpartum women does not reduce the risk of illness or death in mothers or their infants (McGuire, 2012). Thus, postpartum women are encouraged to receive adequate nutrients through consumption of balanced healthy diets, by referring to the guidelines on healthy eating during lactation (WHO, 2011).

## **5.3 Maternal Factors Associated with Care Practices**

Maternal factors included education level, marital status, occupation and number of children given birth. Findings from this study showed that all the factors did not have any

significant relationship with quality of child care practices. Possible reason for not having any significant association might be due to the nature of extended family support in the households which makes maternal factors to have no direct influence on child care practices. However, some literature indicates a direct relationship between the well-being of mothers and child development and that poor maternal social support are associated with highest risk of developmental problems among children (Tough *et al.*, 2010). It has been known that mother's education is very important in relation to child health and wellbeing (Britto *et al.*, 2017). Study done in Bangladesh reported maternal education and household income to be associated with poor cognitive development among children (Chowdhury *et al.*, 2018).

#### **5.4 Relationship between Quality of Child Care and Nutritional Status**

In testing for relationship between the overall quality of care and nutritional status it was shown that the care index scores were statistically associated with underweight ( $p=0.003$ ), but not with any of other nutrition status indicators (stunting and wasting). Other studies have also shown that some attributes of care practices such as inadequate diet, household water safety practices, types of latrine and hand washing with soap and water are associated with child underweight (Mukabutera *et al.*, 2016; Adhikari *et al.*, 2017). Possible explanation is that underweight is a more sensitive indicator of malnutrition compared to stunting which is a long term effect. The next sections will discuss the findings of each parameter of care practices.

##### **5.4.1 Maternal health care score and nutritional status**

In the present study maternal health care score was found to have no any significant relationship with child under nutrition. This might be due to maternal nutritional status which was not included in the index. Addition to that, in Tanzania maternal health care have been improved from 2010 (59%) to 2016 (81%) with substantial increases in the



percentage of women reported to receive several components of ANC care (TDHS 2015-16). About 8 in 10 pregnant women took iron tablets or syrup for prophylaxis of anaemia, 7 in 10 pregnant women took anti-malarial drugs and 63% of pregnant women took anti-parasitic intestinal drugs (TDHS 2015-16). However, it is contrary to some of the literature which point out some of the variables included in the maternal care index to have a significant effect on child under nutrition such as taking anti-malaria tablets (Christian *et al.*, 2015). Poor nutrition and malaria may have immediate and long term adverse consequences in child health and nutrition outcome (Hanson, 2014). Having mothers with better health outcome is beneficial for improving child health and nutrition outcome.

#### **5.4.2 Child immunization and nutritional status**

The present study has shown that nearly all the children (99%) were fully immunized for their age and they had category one score (good practice) in child immunization parameter. This is similarly with the most recent TDHS findings which showed high percentage of vaccination coverage 75% in 2016. However, vaccination coverage has remained virtually unchanged since 2010 (TDHS-2016). From this study, statistical significant relationship was not observed between child immunization scores and nutritional status. Contrary to the study conducted in sub-Sahara African countries found that BCG vaccination was associated with stunting when given in later period of infancy (Berendsen *et al.*, 2016). The antimicrobial effect of BCG can have effect on stunting and underweight to children (Prendergast and Humphrey, 2014; Arts *et al.*, 2016; Kleinnijenhuis *et al.*, 2014).

#### **5.4.3 Child feeding practices score and nutritional status**

Findings from this study showed that there was a statistically significant association between feeding practices score and underweight and wasting with a p-value of 0.009 and 0.017 respectively. Similarly, to the study conducted in Rural China, infant and child

feeding index was associated with underweight and wasting (Zhang *et al.*, 2009). Feeding practices index comprise key elements regarding infant and young child feeding practices as recommended by WHO. Therefore, its significant association with under-nutrition might be attributed with different kind of practices such as breastfeeding practices, introduction of complementary foods, prelacteal feeding, meal frequency as well as dietary diversity and lack of knowledge on appropriate infant and young child feeding practices. Addition to that there are substantial evidence indicating that feeding practices is among the key determinant of nutritional status to children. Some literature has shown that exclusive breastfeeding is one of the significant determinants of child under nutrition (Jamro *et al.*, 2012; Kandala *et al.*, 2011; Egata *et al.*, 2014). On the other hand, dietary diversity and number of meals the child ate per day mention to have a significant association with child under nutrition (Jesmin *et al.*, 2011; Saaka and Osman, 2013). However, the influence of feeding practices score in the nutritional status of children can be affected by different determinants such as maternal knowledge on child nutrition and health care practices, maternal nutritional status, intra-household food allocation and access to health services which some were not included in the index (Motbainor *et al.*, 2015). Appropriate feeding index with regards to residential characteristics in different kind of societies and cultural practices should be designed and implemented to measure the extent of feeding practices and child health and nutrition outcome.

#### **5.4.4 Psychosocial care score and nutritional status of study children**

Most of the study children were reported to have category one scores on psychosocial care practice and there was no any statistical significant relationship between psychosocial care scores and child nutritional status. However, it is known that psychosocial factors have influence to the quality of physical care such as interaction with other children, participation into simple household activities, physical movement and care taken during

child feeding as well as sensitivity to child's needs in general. Moreover, it has a direct effect on child growth and development contrary to our findings.

Some studies have reported that improving the quality of psychosocial care and interaction increases the undernourished child's mental ability (Bhutta *et al.*, 2013; Alderman, 2016). In addition, there is a beneficial effect on physical growth and development of children by improving the quality of psychosocial care and interactions (Chavez *et al.*, 1971; Benton, 2010). Current evidence suggests that psychosocial care and child development interaction starts early in the child's life (WHO, 2018). In circumstances where the child is poorly developed at birth, the psychosocial factors may take lead in their life.

Thus it may be useful to take a step back and identify more factors to be included in the tool that influence the quality of psychosocial care, or possible constraints to it such as caregiver knowledge and beliefs, health and nutritional status of caregiver, mental health and social support received from family and community.

#### **5.4.5 Hygiene practices score and nutritional status**

Most (97%) of the households had category one scores which implies a best practice on hygiene practices index. Sampled areas in Temeke municipality have access to pipe water from the municipal council. Over half of the caregivers treat their drinking water through boiling and some through using water guard. However, hygiene practices score was not associated with child under-nutrition. This collaborate earlier findings from non-randomised studies which indicate that the potential effects of improved water supply on child linear growth tend to be much smaller than those of improved sanitation (Rah *et al.*, 2015). This lack of association in analysis may be explained by the current predominant use of an improved drinking water source in our country generally, reflecting source only not on water safety. TDHS 2015-16 showed that 61% of households in Tanzania have access to improved sources of drinking water, 86% of urban Mainland households, 49% of rural Mainland households.

Access to improved water source in Tanzania has improved substantially since the 2010 TDHS (from 57% to 61%). Most of the households in this study reported of using piped water into their daily activities. However, some of the studies explained that significant association between improved water sources and child linear growth exist only when it is accompanied by improved sanitation and water storage practices (Checkley *et al.*, 2004; Merchant *et al.*, 2003; Islam *et al.*, 2018).

## CHAPTER SIX

### 6.0 CONCLUSION AND RECOMMENDATIONS

#### 6.1 Conclusion

The purpose of the study was to develop a tool that can be used to assess the quality of child care practices and to explore various attribute of care. Experience with composite indicators for dimension of quality of care practices has shown potential in assessing health and nutrition outcome. On the basis of the findings, the conclusion that can be drawn is that tool development has been taken as a first step in formulating a more universal tool to be used for assessing child care practices within households in different societies in Tanzania.

In assessing the individual parameters of child care, maternal factors such as education, marital status, occupation and number of children given birth were not significantly associated with quality of care practices. The overall care scores were significantly associated with underweight and only feeding practices score was found to have a statistical significant relationship with underweight and wasting.

## **6.2 Recommendations**

In the light of the findings of this study, the recommendation is that additional research is needed to test the tool in other areas with different socio-economic settings in order to improve its reliability and validity. Also it is recommended to widen the coverage of experts by including more varied type of stakeholders and to continue in developing and validating simple tools to measure child care practices that can be used in different societies in Tanzania.

Appropriate feeding index with regards to residential characteristics in different kind of societies and cultural practices should be designed and implemented to measure the extent of feeding practices and child health and nutrition outcome.

Further studies are needed to identify more factors and indicators to be included in the index that might have influence on quality care practices.

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## APPENDICES

### Appendix 1: Questionnaire for collecting information

#### Introduction

Dear respondent, my name is ..... a master of science in Human Nutrition Degree student at Sokoine University of agriculture, Morogoro. I am currently doing research so as to make my study successful. The title of my research is “*quality of care practices provided to children below five years of age*”. all the information that you provide will be treated confidentially and will be used only for the purposes of this study.

#### SECTION 1.DEMOGRAPHIC INFORMATION

SURVEY IDENTIFICATION	Code
Date	Enter as dd-mm-yy
District code	Temeke Municipal =1
Ward code	Makangarawe=1 Mtoni = 2 Sandal=3 Kilakala=4
Household ID number in village	
Respondent's name	Mother
Enumarotor Name and Signature	
CHILD INFORMATION	
Q1. What is your child's name?	
Q2. Sex?	Male =1 Female =2
Q3. How old is [child's name]?	Record the <i>birth date</i> from RCH card if it is available

Q4. What is the birth weight of {child's name]	Enter weigh kg (If not available/Don't know enter 88)
Q5. What is your age ?	
Q6.what is your highest education level attained.	Primary school=1 Drop out secondary school=2 Secondary school=3 College /university=4
Q7.What is your marital status	Married and lives with the spouse =1 Married but lives away from the spouse=2 Single mother =3 Divorced=4 Widowed=5
Q8.What is your occupation	Employed =1 Self employed=2 Housewife =3
Q9.How many children do you have	One =1 Two=2 More than two=3

## SECTION 2: CHILD CARE INDEX

### SECTION 2A: HEALTH SEEKING PRACTICES

#### I. Variable and scoring system for maternal care

Variables	Coding
Q1. Did you attend any antenatal care (ANC) services?	Yes=1 No=0
Q2. If no, Why did you not attend an ANC?	Distance too far =1 Don't think I needed to attend=2 Don't like the staff =3 Inadequate service and equipment=4 Other (specify=77)
Q3. If yes, what was the time for visiting RCH for the first time	Within first 3 month= 1 Within six month = 2 During last trimester=3 Visited during delivery days =4
Q4.What was the frequency of visiting RCH during pregnancy current child	Once =1 Twice =2 Thrice =3 More than three times = 4
Q5.1 <sup>st</sup> trimester ANC Visit	Once =1 Twice =2 Thrice =3

	More than three times = 4
Q6.2 <sup>rd</sup> trimester	Once =1 Twice =2 Thrice =3 More than three times = 4
Q7.3 <sup>rd</sup> trimester	Once =1 Twice =2 Thrice =3 More than three times = 4
Q8.Were you given or did you buy any iron and folic acid tablets or syrup?	Yes =1 No =0 Don't remember =88
Q9.If yes ,for how long did you take Iron -folate supplement while pregnant with [child name]	Full (270 days)=5 Partial 180-269 days=4 90-179days=3 30-89 days=2 Less than 29 days or none =1
Q10.Did you take deworming tablets while pregnant with [child's name]?	Yes =1 No =0
Q11.Did you take malaria tablets for prevention while pregnant with [child's name]?	Yes =1 No =0
Q12.Did you get tetanus immunization?	Full protection(Five doses) =2 Partial protection (Less than five doses)=1 None =0
Q13.Was this child born at health center or at home?	Health facility=2 Home=0
Q14.Did you receive Vitamin A within 2 months of delivery	Yes =1 No =0
Q15.While you were pregnant with this child, did you receive any information/help regarding feeding your child?	Yes =2 No=0
Q16.What information did you receive	Breast feeding =1 Introduction of complementary food =2 Both breastfeeding and introduction of Complementary foods =3 Other (specify)=77

## SECTION 2B: CHILD HEALTH AND IMMUNIZATION

	Coding
Q1.Do you visit the RCH clinic for child monitoring during clinic days	Yes =1 No=0
Q2.Did [child's name] complete all vaccinations according to his /her age?	Yes =1 No=0
Q3.Vaccination Card	Available=1 Not available=0
Q4.BCG date	Enter as (dd/mm/yy)
Q5.BCG Scar	Yes =1

	No =0
Q6.DPT3 [“Pepopunda”] date	Enter as (dd/mm/yy)
Q7.OPV3 [“Matoneyakuzuiaugonjwawakupooza”] date	Enter as (dd/mm/yy)
Q8.Measles [“Surua”] date	Enter as (dd/mm/yy)
Q9.Has ever received a vitamin A capsule (supplement) (age of under 9 month normally they don't receive Vitamin A)	Yes =1 No =0 doesn't remember =88
Q10.Did [child name]receive a medicine for worms in the last six months?	Yes =1 No =0 don't remember=88
Q11.Has [child name] suffered from any of the following problems in the last month ?	Fever/Malaria=1Urinary tract infection=2 Diarrhoea=3 Cough with Upper respiratory tract infection =4 Other illness( specify)=5
Q12.If yes, to at least one of the above illness ,did you send [child's name] for medical checkup/treatment in the last month	Yes =1 No=0
Q13. If [child's name] has had diarrhoea among the illness mentioned, how was he/ she treated?	Given ORS Fluid =1 Homemade sugar and salt solution=2 Antibiotics =3Other (specify)=77
Q14.When [child's name] got sick,do you maintain the same amount of food/and breasfeed or you feed less amount? (If is “less”why and record all reasons).	Less=1 About the same=2 more than normal=3 Don't Know/remember=88
Q15. Do you normally keep [child's name] under a mosquito net at bed time?	Yes (All the time during bed time) =1 Yes (sometimes)=2 Don't own mosquito net=3 Don't remember=88



**SECTION 2C: CHILD FEEDING PRACTICES****I. Variable and scoring system for breastfeeding practices**

<b>Variables</b>	<b>Coding</b>
Q1. Did you ever breastfeed	Yes=2 No =0
Q2. How many hours after birth was breastfed for the first time	Within 1 hour after birth=1 From 1 to 3 hours after birth=2 More than 3 hours after birth=3 Does not know/remember=88
Q3. Did you give child anything soon after delivery before breast feeding (prolactal)?	Yes =1 No =0
Q4. If yes what did you give the child.	Water =1 Porridge =2 Tea =3 Herbal drinks=4
Q5. During the first six months what did you give your child to eat?	Breast milk only (no other food or fluids)=1 Breast milk and other fluids (e.g. formula milk, cow's milk juice or water but no solid foods)=2 Breast milk, thin porridge and other fluids =3 Breast milk with other fluid plus solid foods=4 Other(specify)=77
Q6. At what time do you breast feed your child	Anytime =1 After every 2 hours=2 Three times a day=3 When she/he cry=4
Q7. How old was the child when he/she first had any solid/semisolid food?	If a mother cannot remember exactly, please put in the approximate age in the box to nearest whole week/month
Q8. For how long did you continue to breast feed [child name] (question applicable for a child above 2 years)	Put approximate age /nearest month

**II. Variables and scoring system for complementary feeding practices**

<b>Variable</b>	<b>Coding</b>
Q9. Consistency of complementary foods	Liquid/watery=1 Semi-liquid=2 Thick/semisolid=3 Solid =4 Doesn't remember=88

Q10.Composition of complementary food( dietary diversity should be obtained from Qualitative 24hrs dietary recall)	
Q11.Does your child has a special meal or is just eating the general family meal?	
Q12.Meal frequency	Two times per day =1 Three to four times per day=2 five to eight times per day=3 above nine times per day=4 Others specify =77

### SECTION 2D: PSYCHOSOCIAL PRACTICES

Variables	Coding
Q1. Who does your child sit with during mealtime?	Alone =1 With family members=2 With sibling(s) =3 With caregiver only =4 Others =77
Q2.Where do your child sit when taking a meal?	On table=1 On mats=2 On ground=3 On floor=4 Others =77
Q3.How do you normally serve food to your child?	Separately =1 Along with family food =2 Share with sibling=3 I don't serve for him/her=4 Others =77

Q4. If your child has low appetite, what do you normally do?	Giving snack between the meal=1 Giving small portions of meal at a time =2 Others =77
Q5.How do you normally vocally react to your child when he/she does something wrong?	Sharp tone or raised voice=1 Friendly tone=2 My tone depend on the child manner=3 others =77
Q6.What does your child use to feed him/herself?	A spoon=1 Holds a cup independently=2 Uses his/her hand=3 Cannot feed him/herself=4 Others=77
Q7. How did you support your child when he /she start to :Sit, crawl, stand up with object, stand up alone,talk, run ..	By giving him/her supporting material like car toy, standing and sitting objects etc=1 By removing dangerous objects on his/her way =2 Living him/her alone without any support=3 Others =77
Q8.What kind of simple household activity does your child perform? (applicable for 2 years and above)	Washing small dish=1 Picking up small object=2 Doing shopping together =3 Staying together in the kitchen=4 Others =77
Q9. Can the child wave good-bye?	Yes =2 No =0
Q10.What kind of safe sports to do you encourage your child to play?	Jump,run, hide and seek game=1. Climbing trees, playing with sharp and electrical objects =2
Q11. What kind of activities does your child like to do most of the time?	Drawing pictures =1 Watching cartoon=2 Playing with toys=3 Reading and writing stories=4 Listening stories and singing =5 Playing with others =6 Sleeping=7 Staying alone=8 Others =77
Q13.Can your child mention simple phrases such as mama,baba,dadaetc	Yes =2 No =0

**SECTION D: HYGIENE PRACTICES**

Q1. What area do you use for food preparation?	Separate kitchen= 1 Non kitchen areas (open space)= 2 Others =77
Q2. Where do you keep child's food when not consumed?	Hot pot =1 Closed lid containers =2 Refrigerator=3 Open containers or pot=4 Others =77
Q3. What kind of toilet facility do your household members usually use?	Pit latrine =1 Flush type=2 Composting toilet =3 Bush /field=4 Other.....77
Q4. What kind of toilet facility do you use for your child who can not use the general/household facility?	Sitting pot=1 Dippers =2 Bush /open space=3
Q5. Where do you dispose of child's solid and liquid wastes	Garbage pit=1 Bury=2 Burn=3 Pit latrine =4 Others=77
Q6. What is the available source of water	Piped water=1 Rain water collection=2 Surface water (river, stream, dam, lake, pond, canal, irrigation channel)=3 Protected well=4 Others.....77 Does not know=88
Q7. What do you usually do to make water safe	Boil=1 Water guard =2 Use water filter=3 Let it settle and stand=4 Others.....77
Q8. At what time do you wash your hands	Before and after meal preparation =1 Before and after giving food to a child=2 Before and after meal=3 After using toilets=4 After Bathing and changing dippers =5 Others = 77
Q9. How do you wash your hands	With bar soap=1 With a liquid soap or sanitizer =2

	With only water =3 Don't wash=4
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### SECTION E: ANTHROPOMETRIC MEASUREMENT OF CHILD

ANTHROPOMETRIC MEASUREMENTS					
AC	Child Name and Code				
	Sex				
	Birth date				
			Measurement 1	Measurement 2	Mean
AC	Child's Height/length	cm			
AC	Child's weight	Kg			
AC	Presence of Oedema(Bilateral Pitting Edema)	enter plus sign according to the degree of oedema	Mild	Moderate	Severe

### SECTION F: 24HRS DIETARY RECALL SHEET FOR CHILDREN

TIME	FOOD	INGREDIENTS
<b>Breakfast</b>		
<b>Snack</b>		
<b>Lunch</b>		
<b>Snack</b>		
<b>Dinner</b>		

#### Food groups for dietary diversity assessment

Food group	Type of food or meal	Yes =1 No =0
1	Cereals eg maize, sorghum, finger millet, pearl millet, wheat	
2	Vitamin A rich (re/yellow/orange/vegetables and tubers eg pumpkin, carrot, tomatoes, orange fleshed sweet potatoes.	
3	Other roots and tubers eg cassava, round potatoes, sweet potatoes, yams, green bananas	

4	Green leaf vegetables	
5	Vitamin a rich fruits e.g mangoes,papaya,100%fruitjuice made from these, other locally available vitamin A rich fruits	
6	Other vegetables and fruits	
7	Legumes e.g beans ,peas, cowpeas, pigeon peas, soybeans	
8	Nuts and oil seed e.g groundnuts, sunflower, pumpkin seeds	
9	Animal milk ,milk product	
10	Eggs	
11	Organ meats e.g liver, kidney blood based food	
12	Fresh meat e.g beef, goat, pork, lamb, chicken	
13	Fish ,sardine, or other sea foods	
14	Oil, fat, ghee, or butter used for cooking or added to food	
15	Sugar, honey, sugary product, sweetened sodas or juice drinks e.g soda, sweets, chocolate, cookies, cakes	
16	Spices, condiments, beverages e.g salt, pepper, coffee, tea	

## Appendix 2: CARE SCORE INDEX

### Section I: Variables and scoring patterns for health seeking practices of the mother

Variables	Score
Attendance to antenatal care (ANC) services	Yes → 1 No → 0
Visiting ANC for the first time	First 3 month → 2 Second and third trimester → 1 Only on the delivery days/did not attend → 0
Frequency of visiting ANC	More than three times → 3 Thrice → 2 Once /Twice/None → 0
<b>Frequency of visit in each trimester (1<sup>st</sup> trimester ANC Visit t/2<sup>nd</sup> trimester visit /3<sup>rd</sup> trimester visit)</b>	More than three times → 3 Thrice → 2 Once, Twice, None → 0
Took iron and folic acid tablets or syrup	Yes → 1 No → 0
Duration of taking Iron -folate supplement	Days 180-270 → 3 Days 30-179 → 2 Less than 30 days → 0
Took de-worming tablets	Yes → 1 No → 0
Received malaria tablets	Yes → 1 No → 0
Received Tetanus immunization	Full dose → 2 Partial dose → 1 None → 0
Place of delivery	Health facility → 3 Home → 0
Received Vitamin A (within 2 months of delivery)	Yes → 3 No → 0
Not received	Yes → 3 No → 0
Receive nutrition education and information/counseling	Yes → 3 No → 0
Did not receive nutrition education/information/counseling	Yes → 3 No → 0

### Section II: Variables and scoring pattern for child health and immunization

Variables	Score
Visited RCH for child growth monitoring relation to age	Yes → 2 Only partially → 1 No → 0

Vaccination Card	Available → 2 Not available → 0
Received BCG	Yes → 2
<b>Received DPT3 [“Pepopunda”]</b>	Yes → 2
<b>Received OPV3 [“Matone ya kuzuia ugonjwa wakupooza”]</b>	Yes → 2
<b>Received Measles [“Surua”]</b>	Yes → 2
Received vitamin A capsule (supplement, age above 9 month)	Yes → 2
Receive de-worming in the last six months	Yes → 2
Child got ill in the last month	Yes → 0 No → 2
For a sick child sent for medical checkup/treatment	Yes → 1 No → 0
Use of mosquito net	All the time → 2 Sometimes → 1 Don't own mosquito net → 0
<b>Maintaining the amount of food (for a sick child).</b>	More than usual → 2 About the same → 1 Less → 0

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### Section III: Variables and scoring pattern for child feeding practices

Variables	Score
Ever breastfeed	Yes → 2 No → 0
Initiation of breastfeeding after delivery	Within one hour → 3 One to three hours → 2 More than three hours → 0
Use of prolactal	Yes → -1 No → 2
Breastfeeding on demand	On demand (anytime) → 3 After every regulated time → 1 Only when the mother is round or feel like doing it → 0
Timely initiation of complementary food	6month → 3 7-8 month → 2 4-5month → 1 Less than 4 month → 0
Duration of breastfeeding	2 years and beyond → 3 Between 1 and below 2 years → 2 Less than 1year → 1
Food consistency	<b>6 to 11months of age</b> Semi solid → 2 Semi liquid → 1 <b>12-24month and above 24months of age</b>



Dietary diversity- (number of food groups consumed in the past 24hrs)	Solid → 2 Semi Solid → 1 <b>6-11 months of age</b> 0-2 → 0 3-4 → 2 5-7 → 3 <b>12 -24 months of age</b> 0-2 → 0 3-4 → 1 5-7 → 3 <b>Above 24months of age</b> 0-2 → 0 3-4 → 1 5-7 → 2
Provided with a special meal	<b>24months of age and below</b> Eats special meal → 3 Eats family meal → 1 <b>Above24 months of age</b> Eats special meal → 2 Eats family meal → 1
Meal frequency per day	<b>6-11 months of age</b> Less than two meals → 1 Above three meals → 3 <b>12 -24 months of age</b> less than two meals → 0 Above three meals 3 → 2 <b>Above 24months of age</b> less than two meals → 0 Above three meals 3 → 2

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#### Section IV: Variables and scoring pattern for psychosocial practices

Variables	Score
Caregiver Sitting with a child during mealtime	<b>6-11months of age</b> With caregiver only → 2 With caregiver and sibling → 1 <b>12-24months of age</b> With family members → 1 With caregiver → 2 Alone → 0 <b>24-36months of age</b> Alone → 1 With family member → 1 With caregiver → 2 <b>36-59months of age</b> Alone → 2 With family member 2
Child eating place during meal time	Table or mats → 2 Bare ground /floors → 0
Child meal served	<b>6-11 months of age</b> Separately → 2 Along with family → 0 <b>12-24months of age</b> separately → 2 Along with family → 0 <b>24-36months of age</b> Along with family → 1

	Separately → 2
	<b>Above 36months of age</b>
	Separately → 1
	Along with family → 1
Sensitivity to child need (voice reaction)	Tone depends on the manner → 1
	Friendly tone → 2
	Raised voice → 0
Holding/using feeding tools	<b>12month-24months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
	<b>25-36months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
	<b>37- 59months of age</b>
	holding cup/spoon → 1
	Cannot feed himself → 0
Supporting a child when start to : Sit, crawl, stand up with object, stand upalone, talk, run ..	providing supporting material/ensuring environment safety → 2
	No support is provided → 0
Child's activities	<b>12-24months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	<b>25-36months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	reading/writing → 2
	<b>37-59months of age</b>
	Staying alone → 0
	Drawing/playing/Story telling → 2
	reading/writing → 2

### Section V: Variables and scoring pattern for hygiene practices

Variables	score
Area for food preparation	Kitchen → 2
	Non kitchen area (e.g open space) → 0
Food storage	Refrigerator/sealed containers/hotpots/thermos flask → 2
	None of the above → 0
Household toilet facility	Pit latrine/flush type → 2
	No facility → 0
Child toilet facility	Sitting pot/dippers → 2
	Open area/others → 0
Child's solid and liquid wastes disposal	Garbage pit/bury/burn → 2
	Thrown in the surrounding environment → 0
Available source of water	Piped water → 2
	Protected well/surface water/rain water → 1
Water safety (treatment)	Treatment/boil → 2
	No treatment → 0

Hand wash	After or before critical moments → 2
	Don't wash → 0
Reagent used for washing hands	Soap/Sanitizer → 2
	None → 0

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