



Assessment of Complementary Feeding Knowledge, Practice and Habit among Mothers of Infant and Young Child Aged (6-24 Months) in Kinondoni Municipality

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Abstract

Background and Objective: Inappropriate complementary feeding are a major cause of child malnutrition and death. Progress on complementary feeding has not been made as done in breastfeeding, while research and development have contributed to an expanding evidence base for recommendation on appropriate feeding and effective intervention for children after six months of age but translation of new knowledge into action has lagged behind. this study assessed knowledge, practice and habit of mothers of infant and young child aged 6-24 months regarding complementary feeding.

Materials and Methods: This community based cross sectional study was carried out in Kinondoni municipality specifically at Hananasif and Mzimuni ward between 6 months to 24 months children from April to September 2021. A close ended questionnaire was deployed to random mothers of children from study area to assess knowledge level, hygienic practice, complementary food variety group, and nutritional status of children. Data was analyzed by using SPSS version 20 and ENA for SMART for anthropometric measurement.

Results: A total of 232 subjects were included from the study area. Overall, 104(44.8%) respondent were had low knowledge, 39.7% had poor hygienic practice during giving complementary food and 21.1%, 2.2% of children were stunting and underweight respectively. Lastly about 98.7% were not severely malnourished.

Conclusion: There was a gap in knowledge and practice among mothers regarding adequate age of initiation of complementary feeding, preparation, and Hygienic practices

Keywords: Complementary Feeding; Knowledge; Practice; Habit; Mothers; Kinondoni and Infant and Young Child

Abbreviations

BSc. EHS: Bachelor of Science in Environmental Health; IYC: Infant and Young Child; UNICEF: United National International Children Emergency Fund; MDGs: Millennium Development Goals; MUHAS: Muhas University of Health and Allied Sciences; TFNC: Tanzania Food and Nutrition Centre;

WHO: World Health Organization.

Introduction

Background

Complementary feeding according to world health organization (WHO) is defined as the introduction of

nutritionally appropriate and safe food for infant aged 6 months and above to supplement breastfeeding. After six months of exclusive breastfeeding, mothers milk alone is no longer adequate to meet nutritional requirement of the infant, indicating the need for introducing complementary foods. Appropriate complementary feeding reduces the risk of childhood malnutrition while inappropriate complementary feeding represents major risk to the health and development of the children and repeated illness [1].

In Tanzania complementary feeding practices are sub-optimal as they do not meet the four WHO recommended complementary feeding indicators (introduction of solid, semi-solid, and soft food; minimum dietary diversity; minimum meal frequency and minimum acceptable diet) [2].

However, progress on complementary feeding has not been made as done in breastfeeding, while research and development have contributed to an expanding evidence base for recommendation on appropriate feeding and effective intervention for children after six months of age translation of new knowledge into action has lagged behind.

Globally, low rate nearly 28.2% of children 6-23 months of age receiving minimally diversity diet. (According to current situation of complementary feeding at the global and regional level is reported within the UNICEF global database).

Studies conducted on knowledge, altitude and habit of mothers of infant and young child aged 6-24 months shown that the knowledge regarding timely initiation of complementary feeding among the mothers is inadequate and practice feeding are inappropriate. False beliefs as well as social and cultural taboos tend to wean the child at an inappropriate age and prevent consumption of nutritious food. This study aimed to assess knowledge, practice and habit of mothers of infant and young child aged 6-24 months regarding complementary feeding.

Problem Statement

According to Tanzania national nutrition survey 2018, at national level the survey showed that the proportion of children aged 6-24 months who receive appropriate complementary feeding was only 35.1% and 30.3% received a minimum acceptable diet. Inappropriate complementary feeding practice have been shown to increase the risk to malnutrition as well as diarrhea among under five children due to unhygienic practice during complementary feeding [3]. Example more than 3.3 million children about 34% have chronic malnutrition regarding to stunting, and 600,000 children suffering from acute malnutrition and one of drivers of such are shown to be inappropriate complementary

feeding habit which is against as recommended by WHO.

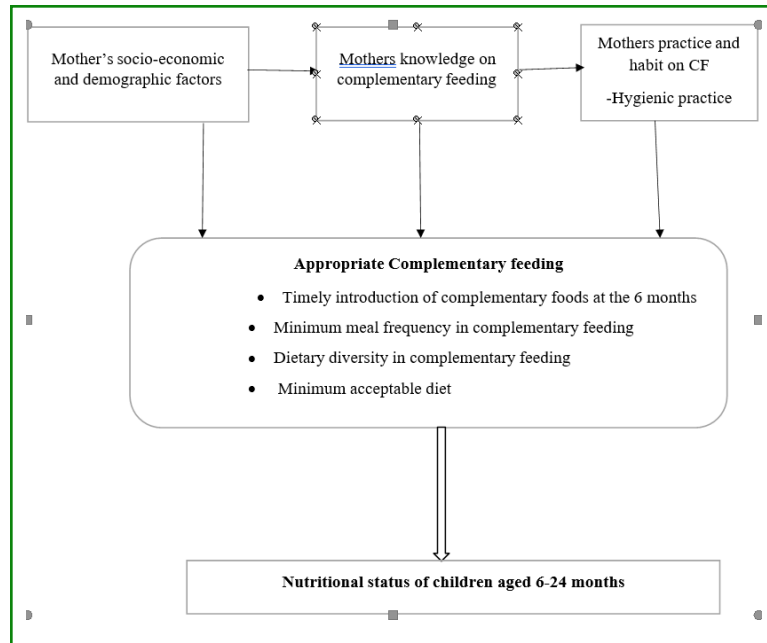
In Dar es Salaam the Malnutrition status have shown to rise from 16.3% in 2014 to 20.1% in 2018 which is great rise and this is why this study need to be done in Dar es Salaam. Malnutrition for children lead to morbidity, low learning ability, diarrhea and mortality of infant and young children. Mothers feeding practice on IYC, maternal education, knowledge, practice and habit have been shown to be predictors of inappropriate complementary feeding. Also, cultural practice has reported as the cause of inappropriate complementary feeding [4].

Despite the government and other stakeholders implementing a number of strategies aimed at improving infant and young child feeding knowledge and practices, there is huge increase of malnutrition status in Dar es Salaam from 16.3% in 2014 to 20.1% in 2018 which one of the cause is inappropriate complementary feeding, so assessing complementary feeding knowledge, practices and habit among mothers of infant and young child in Dar es Salaam is essential.

The research gap of this research proposal with other that are published is that, this study aims at assessing knowledge, practices and habit in relation to outcome of nutrition status of children while other study looks only at knowledge, and practices. Another is that this study aim at assessing condition in urban, where a number of people are literate compared to other study that are already done in rural areas where number of people are illiterate and have limited information due to low media access thus why many studies showed low knowledge on mothers but in this study I need to know the situation in urban regarding of being accessible to many information.

Conceptual Framework

The conceptual framework shows that mother's demographic and socio-economic factors like; age, occupation, education level, religion, child's age and sex may influence and modify her knowledge on complementary feeding. Mother's knowledge, practice, demographic and socio-economic factors may influence complementary feeding in terms; minimum meal frequency, introduction of solids, semi-solids and soft foods, timely introduction of complementary foods, dietary diversity in complementary feeding, minimum acceptable diet. Complementary feeding practices are major determinant of a child's nutritional status. Both socio-economic and demographic factors, knowledge and practice determine either appropriate or inappropriate complementary feeding, and that CF will determine nutritional status.



Rationale

The result (Data) obtained from this study will be crucial way for understanding updated knowledge, practice and habit among mothers of children thus to assist policy make, government as well as TFNC in designing intervention on implementing and monitoring complementary feeding to prevent child morbidity and mortality.

Assessment of complementary feeding knowledge, practice and habit of mothers of infant and young child aged 6-24months will be important to enhance improvement in child feeding practice and improving health status of children. intervention promoting appropriate knowledge, practice and habit on complementary feeding can prevent many deaths in children under five years.

Inappropriate Complementary feeding practices in Dar es Salaam especially Kinondoni municipality are important public health concern due to increase in some cases of malnutrition under five years. Thus, this study was overlooked the problem in the community thus to come with recommendation and measures that will be important in recruiting the situation.

Research Questions

General Research Question

What is the level of complementary feeding knowledge, practice and habit among? mothers of children aged 6-24 months in Kinondoni municipality?

Specific Research Question

- What is the current knowledge level reported by mothers

of children below 2years toward complementary feeding?

- What are the nutritional status of children aged 6-24month in Kinondoni?
- Which type of complementary food given to children below 24month?
- Are they follow hygienic practice during complementary feeding?

Objectives

Broader Objective

To assess knowledge, practice and habit of complementary feeding among mothers of infant and young child aged 6-24 months.

Specific Objective

- To assess the nutrition status of children aged 6-24months.
- To determine the level of complementary feeding Knowledge among mothers of infant and young child aged 6-24months.
- To assess hygienic practices associated with complementary feeding.
- To identify types of complementary food variety groups given to children for the past 24 hours.

Literature Review

Introduction Complementary Feeding

According to WHO, complementary feeding period start from 6 to at least 24months and this is the critical point for infant growth and development [1]. At 6-8month breast milk provide

60% of the total dietary energy requirement and 40% should be delivered from complementary foods. At month 9-11, breast milk provides only 50% and 30% at 12-24months. (FANTA-2, 2010) So as the age goes, the requirement for complementary food increase and dietary requirement from breast milk decrease. Content of complementary food should increase as the age increase. Appropriate complementary feeding is achieved when the child diet is adequate in both quantity and quality, but also must be responsive, and timely given. Because is required so as to fill the nutrient and energy gap and ensure proper growth and development of the child.

If appropriate complementary feeding practice were scaled up, approximately 100,000 deaths in children under five could be reported every year (UNICEF)

Policies and Guidelines on Complementary Feeding

The Global Infant and Young Child Feeding Policy (IYCF)

Infant and young child feeding has received a lot attention over the years and global instruments example the global strategy for infant and young child feeding have been formulated to enhance implementation of the infant and young child feeding program. Much effort has been put into the promotion, protection, and support of optimal IYCF at international level, never the less none of the policies and guidelines has addressed appropriate complementary feeding comprehensively (WHO).

The global strategy for IYCF aim to improve through optimal feeding the nutritional status, growth and development, health and thus the survival of infant and young children. Because poor feeding knowledge, practice and habit are major threat to social and economic development, they are among the most serious obstacles to attaining and maintaining health that encounter this age group. Accurate information on optimal feeding practice is lacking, and the number of food insecurity in rural and urban household is on the rise (UNICEF)

Tanzanian Context of the Infant and Young Child Feeding Policy and Guidelines

Tanzania is working hard to improve the survival, growth, development and welfare of children by taking responsible measures and implementing intervention strategies which seek to improve their health and wellbeing. There has been notable progress in child survival [5]. Child health and wellbeing is a high priority on the development agenda as reflected in both national and international strategies such as the National Growth Strategy of Poverty Alleviation (MKUKUTA), Millennium Development Goals, Nutrition Policy and National Nutrition Strategy, The Convention on the Rights of a Child and The Law of the Child Act.

The development of the National Guidelines on Infant and Young Child Feeding (IYCF) is based on the international instruments, global recommendations and guidelines, and national policies and strategies related to IYCF. The guideline, which summarizes the recommendations for feeding of infants and young children at different ages, is especially meant for service providers in maternal and child health, including health service providers and their supervisor; working in Government and non-Governmental organizations and engaged directly or indirectly in care of infant and young children in health facility and the communities [4].

The main goal of the National Guideline is to improve the nutritional status, growth and development, health and survival of infants and young children through optimal feeding practices. (National Guidelines on Infant and Young Child feeding).

Review on Study Objective

Knowledge, Practice and Habit on Complementary Feeding

In the study conducted in Tanzania in 2004-2016 showed that the prevalence on introduction of complementary food was gradually decreased slightly in 2015-2016, and seem that one of the factor seem to cause was maternal education, thus suggested that maternal education is the one of important factor needed to improve complementary feeding as well as child health.

Also, in the study conducted in Pakistan in 2013 on knowledge of complementary feeding, reported that there was a varied level of knowledge on complementary feeding even in two same low socioeconomic status communities and they concluded that education and knowledge of mothers on timely initiation of complementary feeding are important to be given since about 36.3% of child in the study started complementary feeding out of recommended time.

According to study conducted 2012 in Mahaboudha, Kathmandu, Nepal the ideal feeding was practiced only in a minority of children. There was a big gap between the knowledge of mothers about duration of exclusive breast-feeding and their practices of complementary feeding. However, the practices of giving colostrum were interestingly very high. Some of the mothers used lit as a weaning food but a few mothers knew the proper method of its preparation. Amount of complementary feeding given to children was enough in the majority of the children but its consistency and frequency were found to be not appropriate as per recommendation in more than half of the children [6]. There was an association of inappropriate feeding practices with mother's education, type of family, religion, mothers'

profession, knowledge of frequency of complementary feeding and feeding advises during immunization.

Concerning the habit, some studies show that the habit of complementary feeding were largely affected by social belief, Kinabo J, et al. [7] norms, self-efficacy and many mothers of infant and young child it's not their habit deeply to initiate complementary food to the child but resulted from external factor that make them to adapt that behavior of feeding their child on 6 months and onwards.

Nutrition Status of 6-23 Months Old

The method of assessing nutritional status of children are Anthropometric methods, biochemical tests, clinical signs and symptoms and dietary assessment methods used either alone or more effectively in combination, increasingly. Nutrition status assessment system is now applied to define multiple live of nutrition status and not just the level associated with nutrient deficiency, anthropometry is the most tool used for assessing nutrition status of children. Example mid upper arm circumference, weight for age, weight for height, and body mass index [8].

Formative study in Aceh, Indonesia, a nutritional status was assessed using the indicators of underweight, wasting, and stunting to analyze the association between socio-demographic indicators (such as age, weight) and CF with nutritional status. The prevalence of underweight, wasting and stunting were 26%, 23%, and 28% respectively. Age of the child, birth order, birth weight, parents education level, family size and incidence of fever and diarrhea during the previous two weeks were associated with underweight, while child's birth order, father education level, mothers age, family size and fish consumption frequency were associated with wasting, and age of the child, incidence of fever, acute respiratory infection, fortified food consumption were associated with stunting.

Another study in Tanzania with children aged 6-23 months found that when assessing nutrition status stunting, wasting, and underweight of the surveyed children were calculated from Z- score of height for age, weight for height and weight for age based on 2006 WHO standards. From this it seems that the knowledge on consumption of diverse diet was significantly associated with a reduction of stunting, wasting and being underweight in children. The likelihood of being stunted, wasted and underweight was found to decrease as the number of food groups consumed increased. The nutritional status of a community is influenced by a lot of interrelated and complex factors. At the level of households, the nutritional status is affected by the household ability to provide adequate food in both quantity and quality, mother's pattern of upbringing children, nutrition knowledge, and other socio-cultural factors [9].

Types of Food Group (Variety) given to 6-23 Months

A recipe book for mothers and caregivers on complementary feeding for children aged 6-23 months released by FAO in June,2011 they go to the mothers and caregivers of children who generously shared their knowledge and experiences and actively participated in preparing and tasting complementary foods. the study showed that 7 out of 10 children aged 6 months and over fed plain rice, porridge with salt and sometime a little sugar, others receive plain rice with liquid part of soup. These foods fill the child's stomach but they do not provide enough energy and nutrients for good physical growth and development.

Furthermore, this study suggested that good complementary feeding must be have good enriched borbor from a variety of local foods that are available in home, from your garden or the local market such food groups include (rice, sweet potato, or taro), (Fish, meat, liver, egg or bean). Vegetable and little oil that enhance the taste of food.

Globally, only few children are receiving nutritionally adequate and diversified foods, that means they don't consume food at least from four to seven groups of food variety.

The study done in Tanzania showed that the ingredients/ materials used in preparation of complementary porridge flour included maize, sorghum, finger millet, rice, sesame, wheat and groundnut. The blended flour is commonly referred to as lishe. The mothers reported more than 10 different formulations of lishe. The most commonly used ingredients were maize and groundnuts. Other less commonly used ingredients are rice, millet, sorghum, finger millet, soya bean, sardines, beans, wheat, baobab and tamarind [10].

Methodology

Study Area

The study was conducted in Kinondoni municipality. This is the one of municipalities found in Dar es Salaam, coastal region in Tanzania. Kinondoni have four major division, 27 wards and 113 sub-wards and 446,504 household with an average of 4 people per household with a population of 1,755,049, particularly female is 914,247 and 860,802 males.

Study Population

The study participant was mothers or caregivers particularly with infant and young child aged 6-24months residing in Kinondoni municipality. Mothers or caregivers was the main target as respondents because they spend more time with children, and mostly likely involved in complementary feeding. But also, mothers were involved because those young children cannot be able to give information since they are dependent on mothers or caregivers.

Study Design

This study was cross-sectional community-based study involving both quantitative and qualitative method of data collection.

Sample Size

$$n = \frac{Z^2 p(1-p)}{\epsilon^2}$$

n = Estimated Sample Size

Z = standard normal deviate of 1.96 on using 95% CI.

P = proportional of complementary feeding proactive knowledge among Kinondoni mother's population 32%.

ϵ = margin of error 6%

Estimated proportional (P) will be set at 0.5

$$\text{Therefore, sample size } n = \frac{1.96^2 \times 0.32(1-0.32)}{0.06^2} = 232$$

of mothers/caregivers with children <2yrs

Study Variable

The independent variables include the socio-demographic characteristics of the children such as age, and sex of the child, complementary feeding knowledge, and practice. The dependent variables for this study were Nutritional status. This study were covariates maternal age, marital status, and level of education.

Definition of variable was based on the definition of the variables according to WHO standards. Example for practices as independent variables number of times for feeding minimally in a day as follows, 2 times for breastfed 6-9month, 3 times for breastfed children 9-23months and 4 times complementary feeding for non-breastfed children 6-23months.

Sampling Technique

The study techniques on this study was simple random, from four division of Kinondoni, two division was randomly picked from those four then ward from those selected division was divided by two to get equal number of ward of each division in which the study was conducted, then sample size number was distributed equally in each ward selected to meet the required sample size. In each ward selected each household were had equal chance. Mothers or caregivers of infant and young child aged 6-24months living in household was involved in study, only mothers with young children below 6 months of ages and those who are too sick, difficulty to

respond to questionnaires were excluded.

Data Collection Techniques

Structured closed ended questionnaires were introduced to four different parts including sociodemographic characteristics, knowledge, practice and habit toward complementary feeding. Data for assessing nutrition status such as weight of the child, was introduced in part of socio-demographic characteristics before data collection the research assistance was given training course on objective of the study, methodology, confidentiality of the respondent information, respondent right, and informed consent.

The questionnaire was adopted from WHO standard questionnaire for measuring infant and young child feeding indicator. The questionnaire was translated to Swahili language to facilitate easy understanding of respondent to questions, as many people are familiar to Swahili.

Daily supervision of the research assistance was done to ensure correct recording of response, also monitoring for accuracy, consistency, completeness and correct coding before entered.

Data Management

The data collected was reviewed during and after collection. Data was checked for normality, and cleaned to ensure no error, inconsistency and missing data.

Data Analysis

The collected data from mothers/caregiver with children aged 6-24months was entered in computer then checked for completeness and validity and analyzed by statistical package for social sciences (SPSS) version 20.0. from all participants concern with social-demographic characteristics, knowledge, nutrition status, practice and habit will be entered, cleaned, coded, analyzed and finally summarized using descriptive statistics of frequencies, tables, and percentage Data was analyzed for each specific objective by grouping the obtained result from each specific objective as follows.

From the specific objective that is level of complementary feeding knowledge,

If the obtained data show that above 80% of sample size then the level of knowledge is good, if it ranges 50%-70% of sample size then level of knowledge is fair, if its below 50% of the sample size then level of knowledge is poor. This will be the same in assessing practice.

In objective of nutrition status, the nutrition status will be calculated from z-score by ENA for SMART and analyzed as stunting, wasting and underweight according to WHO

standard 2006, from measuring of weight, age and height. In the type of complementary food, data was analyzed by looking the food given to the children, if at least contain more than four type of food groups then the food will be high nutritious to fulfill energy requirement of the child but if contain below four food groups then were low nutritious and cannot fulfil energy requirement.

In hygienic practice, was checked on what do mothers use to feed their child, hand washing before and after feeding, sterilize and washing utensils after feeding, so if all of this are done then there was a good hygienic practice, if two of them are not done then the hygienic practice was bad and poor hygienic practice.

Ethical Consideration

The study obtained ethical approval/ permission from Muhimbili university of health and allied sciences (MUHAS). In school of public health and social sciences. Also informed consent was obtained from study participant before study being conducted. Finally, the confidentiality of the information from the participant including names and other identifying information will never be attached anywhere to their answer.

Inclusion Criteria

Any mothers/caregivers with the child aged 6-24month in selected study area at Kinondoni municipality, who was willing to participate in the study was included as study participants.

Exclusion Criteria

Any mothers/caregivers in selected study area who was not be available during study and those who were not willing to participate was excluded from the study participants, also those who are too sick, difficulty to respond to questionnaires were excluded.

Limitation of the Study

- This study was only based on mothers/caregivers with a child aged 6-24 months living at Kinondoni municipality.
- The research was confined within the selected area in Kinondoni municipality.
- Lack of cooperation from household was one of the limitation of the study.

Budget

The total budget required for this study was four hundred and eighty-five thousand Tanzanian shillings (485,000/=) as shown and described in the Table 1 below.

S/No.	Input Required	Cost
1	Stationary (Questionnaire production photocopying, report writing, dissertation binding)	200,000/=
2	Allowance for training research assistance	10,000/=
3	Field assistance	15,000/=
4	Statician allowance	50,000/=
5	Field work research assistance	50,000/=
6	Transport and communication	100,000/=
7	Contingency	60,000/=
	TOTAL	485,000/=

Table 1: Total budget.

Budget Justification: The budget covered three main activities

- Stationaries: That was used to carter for tools, printing and photocopying
- Allowance: Was used cover for training research assistance, field work allowance who will help data collection and assistance statician allowance.

- Others; was for transport to move to the study area within allocated day for data collection, and the remaining cost is for contingency.

Work Plan

The time schedule chart of the proposed study, including from preparation up to submission are summarized in the Table 2 below

S/No.	Activity	Time (Months)
1	Research Proposal writing	APRIL
2	Presentation of research proposal	MAY
3	Submission of research proposal	MAY
4	Preliminary survey and data collection	JUNE
5	Data entry and report writing	JULY AND AUGUST
6	Report submission	SEPTEMBER

Table 2: Work Plan.

Results

Descriptive Statistics for Demographic Characteristics of the Respondents

Two hundred and thirty-two (232) mothers/caregivers with children aged 6-24 months were included in the study. Out of the total 232 participants, almost (27.2%) of the mothers

belonged to the age group 27-31years with greater number than any other age group. The mean age of mothers being 29.83 years. Both sexes were almost equally represented with 46.6% being males and 53.4% females. The majority of the children were in the age range of 12-24 months (48.7%) with an average age of 12.19 months. Table 3 below summarize the socio-demographic characteristics of the respondent.

Variable	Options	Frequency	Percent %
Age group of mothers	17-21	31	13.4
	22-26	49	21.1
	27-31	63	27.2
	32-36	39	16.8
	37 and above	50	21.6
Age group of children	8-Jun	73	31.5
	11-Sep	46	19.8
	24-Dec	113	48.7
Religion	Christianity	154	66.4
	Muslims	78	33.6
Level of education	Primary	49	21.1
	secondary	135	58.2
	post secondary	28	12.1
	No formal education	20	8.6
Households income	High	16	6.9
	Middle	184	79.3
	Low	32	13.8
Sex of the child	Male	108	46.6
	Female	124	53.4
	Total	232	100

Table 3: Demographic characteristics of the Respondent.

Respondent Knowledge on Complementary Feeding

A total of 110 (47.4%) of the respondents knew the correct definition of complementary feeding, only 4(1.7%) of respondent they didn't know about complementary feeding,

152(65.5%) knew complementary feeding should be introduced at 6 months, with only (19.8%) of respondent complementary feeding should be below 6 months and 14.7% should start at 7 month and above. Majority of the

respondent, 146(62.9%) got knowledge on complementary feeding from health workers. Majority of the respondents, 100 (43.1%) knew the child was to be breastfed on demand after starting on other feeds, but knowledge of the daily minimum frequency of complementary food was fair. About (64.7%) knew a child between 6 – 8 months should be fed at least two times while more than half, (52.1%) knew a child of 9 – 11months should be fed at least three times daily and

(61.9%) knew a child of >12months should be fed at least three to four times daily. Majority, 140(60.3%) knew the appropriate diet for a healthy infant was fortified local foods also more than half of the respondents, 124 (53.4%) knew malnutrition to be an associated risk of late complementary feeding. Most of the respondents, 188 (81.8%) knew the appropriate utensils for feeding (Table 4).

Correct knowledge	Frequency	Percent
Correct definition of complementary feeding	110	47.40%
Age to introduce complementary feeding (6 months)	152	65.50%
	146	62.90%
Frequency of child breastfeeding after starting other feeds (on demand)	100	43.10%
Minimum frequency of giving complementary food in a day		
6-8 months	44	64.70%
9-11 months	25	52.10%
12-24 months	39	61.90%
Most appropriate diet for normal healthy infant	140	60.30%
Implication of starting complementary feeding late	124	53.40%
Appropriate utensils for feeding	188	81.80%

Table 4: Respondents' knowledge of complementary feeding (n=232).

Knowledge Level of Respondent on Complementary Feeding

Mother's knowledge on complementary feeding was based on two scales ("1", "0"). A score of „1“was awarded for a correct response while a score of „0“ was awarded for a wrong response and a total score computed for each mother out of a maximum score of 10. The mothers' knowledge on complementary feeding was categorized into three; low knowledge for those who had a score of 0-4, middle knowledge

for those with a score of 5-7 and high knowledge for those who scored 8-10. about (53.4%) of the mothers/caregiver with children aged 6-24 months had middle knowledge on complementary feeding, only (1.7%) of the mothers had high knowledge whereas about (44.8%) of the mothers had low knowledge on complementary feeding practices. The mean knowledge score for all mothers on complementary feeding was 2.44(SD 1.53) (Table 5).

Variable	Level	Frequency	Percent
Knowledge level	High knowledge	4	1.7
	Medium knowledge	124	53.4
	Low knowledge	104	44.8
	Total	232	100

Table 5: Mothers knowledge level score on complementary feeding.

Association Between Level of Education and Knowledge Level of Complementary Feeding

A Cross tabulation between level of Education and knowledge level concerning complementary feeding was done in SPSS version 20 to determine if there is association. The result

showed p-value to be 0.002 which is less than 0.005($p < 0.005$) and this result indicate there is association between level of education and knowledge level about complementary feeding as shown in Table 6.

Variable	Option	Knowledge level			Total	Chi- square value	P-value
		High knowledge	Medium knowledge	Low knowledge			
Highest level of education	Primary	1	26	22	49	20.9	0
	secondary	0	74	61	135		
	post secondary	3	17	8	28		
	No formal education	0	7	13	20		
	Total	4	124	104	232		

Table 6: Association between level of education and knowledge level about CF.

Hygienic Practice Associated with Complementary Feeding among Respondent

Majority of the respondent 195(84.1%) practiced continued breast feeding, and most of respondent 197(84.9%) were introduced complementary feeding to their child. Majority of the respondent, 138(59.5%) fed their child with bowl and spoon, 22(9.5%) fed with feeding bottle, while 37(15.9%) practiced hand feeding. hand washing before feeding was

done always by 107(46.1%), 3(1.3%) never wash their hand before feeding a child. Majority of respondent 147(63.4%) washed utensils after use. About 60.3% of the mothers had good overall level of hygiene of complementary feeding, and 39.7% had poor hygienic practice. The table below summarize the response of mothers on hygienic practices (Table 7).

Variable options		Frequency	Percent
Do you still breastfeed your child?	No	37	15.9
	Yes	195	84.1
Have you introduced complementary feeding?	No	35	15.1
	Yes	197	84.9
*What do you use to feed your child?	Feeding bottle	22	9.5
	Bowl and spoon	138	59.5
	Hand feeding	37	15.9
*Do you wash your hands before feeding your child?	Sometimes	88	37.9
	Always	107	46.1
	Never	3	1.3
*Do you wash and sterilize feeding utensils after use?	Sometimes	47	20.3
	Always	147	63.4
	Never	4	1.7
Total		232	100

Table 7: Response of mothers/caregivers on hygienic practices.

*Some variable in the table above have missing variable because, respondent who were did not start complementary feeding to their child was not required to respond to some question.

Types of Complementary Food Variety Group Given to Children

Among 232 Respondent, only about 198 mothers/caregiver respond to this question because others who didn't respond was not started complementary feeding to their children. Majority of the respondent for the past 24 hours were provided their children one time meal which was Bread,

cereal, rice (45.5%), vegetable (38.9%), fruit (38.4%), Milk, yoghurt, and cheese (40.9%), Meat, poultry, fish, egg, dry bean and nuts (58.1%), Fat, oils, and sweet sparingly (43.4%). But many respondents provided water to their children two to three times as 109(55.1) and only 81(40.9%) was given four and more times. The table below summarize food variety group given to children (Table 8).

Food variety group Responses	Frequency	Percent	
Bread, cereal, rice	0 times	22	11.1
	1 time	90	45.5
	2-3 times	78	39.4
	4 or more times	8	4
Vegetables	0 times	59	29.8
	1 time	77	38.9
	2-3 times	59	29.8
	4 or more times	3	1.5
Fruit (Banana, orange, mango, pineapple, water-melon)	0 times	42	21.2
	1 time	76	38.4
	2-3 times	70	35.4
	4 or more times	10	5.1
Milk, yoghurt, and cheese	0 times	68	34.3
	1 time	81	40.9
	2-3 times	43	21.7
	4 or more times	6	3
Meat, poultry, fish, egg, dry bean and nuts	0 times	41	20.7
	1 time	115	58.1
	2-3 times	38	19.2
	4 or more times	4	2
Fat, oils, and sweet sparingly	0 times	70	35.4
	1 time	86	43.4
	2-3 times	40	20.2
	4 or more times	2	1
Water	1 time	8	4
	2-3 times	109	55.1
	4 or more times	81	40.9
	Total	198	100

Table 8: Responses of mothers/caregiver on types of complementary food variety group given to children.

Majority of the respondent 1799(90.4%) were provided their children more than four food variety group for the past

24 hours, and 19(9.6%) of the respondent were provided three food variety group (Table 9).

Variable	Responses	Frequency	Percent
Food variety type	More than Four Food type variety	179	90.4
	Below four food type variety	19	9.6
	Total	198	100

Table 9: Food Variety Type.

Nutritional Status of Children Aged 6-24 Months

Stunting (Height-for-Age) based on Z Scores

Height-for-Age index is an indicator of linear growth retardation and cumulative growth deficits. Children who are below the -2SD or - 2 Z-scores are considered short for their age (stunted) and while children who are below -3SD of the Z-scores are considered severely stunted (WHO, 2006). Stunting reflects failure to receive adequate nutrition and

is also affected by recurrent chronic illness. In this study, 21.1% (16.0 - 27.3 95% C.I.) of all the children were stunted with more boys 26.5% (18.8 - 36.0 95% C.I.) than girls 15.8 % (10.0 - 24.2 95% C.I.) stunted. About 12.6% (8.7 - 17.9 95% C.I.) were moderately stunted, while 8.5% (5.4 - 13.3 95% C.I.) were severely stunted. The most age group that was having high stunting group is 18-24 months which was 12.5% for severe and 15% for normal stunted (Table 10).

	All	Boys	Girls
	n = 199	n = 98	n = 101
Prevalence of stunting (<-2 z-score)	(42) 21.1 %	(26) 26.5 %	(16) 15.8 %
	(16.0 - 27.3	(18.8 - 36.0	(10.0 - 24.2
	95% C.I.)	95% C.I.)	95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(25) 12.6 %	(13) 13.3 %	(12) 11.9 %
	(8.7 - 17.9	(7.9 - 21.4	(6.9 - 19.6
	95% C.I.)	95% C.I.)	95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(17) 8.5 %	(13) 13.3 %	(4) 4.0 %
	(5.4 - 13.3	(7.9 - 21.4	(1.6 - 9.7
	95% C.I.)	95% C.I.)	95% C.I.)

Table 10: stunting result (height-for-age) based on Z-score.

*The table above have missing variable because z-score were out of range according to WHO standard 2006.

Wasting (Weight-for-Height) based on Z Scores

Wasting describes the current or short-term nutritional status due to inadequate dietary intake or recent episodes of illness causing loss of weight and the onset of malnutrition.

	Frequency(%)
Moderate Malnourished (>=-3 z-score)	229(98.7 %)
Severe malnourished (<-3 z-score)	3(1.3 %)
TOTAL	232(100%)

Table 11: Wasting (weight-for-height) based on Z scores.

Children whose weight- for- height is below -2SD or -2 Z-score are considered wasted and are acutely malnourished

while children whose weight-for-height is below -3 SD or below -3 SD are considered severely wasted (WHO, 2006). in this study no directly wasting but majority was 98.7% moderate malnourished and severe 1.3% (Table 11).

Underweight (Weight-for-Age) based on Z-Scores

Weight for age is a composite index of height- for-age and weight- for- height. It takes into account both acute and chronic malnutrition. In this study 2.2% (0.9 - 5.1 95% C.I.) of the children were underweight, whereas boys 3.8% (1.5 - 9.3 95% C.I.) and girls 0.8% (0.1 - 4.6 95% C.I.) were underweight. On the whole, 2.2% (0.9 - 5.1 95% C.I.) of all the children were moderately underweight while no children were severely underweight (Tables 12).

	All	Boys	Girls
	n = 226	n = 106	n = 120
Prevalence of underweight (<-2 z-score)	(5) 2.2 %	(4) 3.8 %	(1) 0.8 %
	(0.9 - 5.1	(1.5 - 9.3	(0.1 - 4.6
	95% C.I.)	95% C.I.)	95% C.I.)
Prevalence of moderate	(5) 2.2 %	(4) 3.8 %	(1) 0.8 %
Underweight (<-2 z-score and >=-3 z-score)	(0.9 - 5.1	(1.5 - 9.3	(0.1 - 4.6
	95% C.I.)	95% C.I.)	95% C.I.)
	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %
Prevalence of severe underweight (<-3 z-score)	(0.0 - 1.7	(0.0 - 3.5	(0.0 - 3.1
	95% C.I.)	95% C.I.)	95% C.I.)

Table 12: Underweight (Weight-for-Age) based on Z-Scores.

*The table above have missing variable because z-score were out of range according to WHO standard 2006.

Discussion

Introduction

Malnutrition is a major underlying cause of the child morbidity and mortality in under five in Tanzania. Knowledge on feeding practices of infants and young children is crucial for undertaking or improving health and nutrition

programme in a country. The knowledge and practices for infant and young children feeding, one of the determinants of health and nutrition, has not been well studied in Dar es salaam urban areas.

A search through the available published literature only found few recent studies in Dar es salaam including Kinondoni that

focused on complementary feeding practices and nutritional status of children aged 6-24 months was from national nutritional survey but many published researches is based on Exclusive Breastfeeding. To improve infant and young child feeding practices, mothers' knowledge is considered key.

Mother's Knowledge on Complementary Feeding

Knowledge of timing of complementary feeding was high similar to findings in Lahore city in Pakistan (54%), Karachi (57.2%) and Ghana (60.0%). Only about one quarter of the respondents knew the age when breastfeeding should be discontinued to be 18-24 months. This is far below what was obtained in Pakistan where most of the respondents knew the right time breastfeeding should be discontinued [11]. The World Health Organization recommends that children be fed at least 2 times daily between 6-8 months and at least 3 times for children between 9-12 months and >12months of age. About more than three quarter of the mothers in my study knew the correct frequency unlike in Ghana where almost all the mothers knew the correct frequency [12]. Overall knowledge of the respondents on complementary feeding was average in similar to reports from Lahore in Pakistan. and this study have low knowledge (44.8%) which are approximately similar to study in Kenya (33.5%) [13].

Based on the information from mothers/Caregivers, most of this information was obtained from the health workers, and community health workers, and NGO that works in the study area. Other studies conducted in Pakistan have also reported that the mothers' main source of information is the health facilities. Knowledge on feeding practices of infants and young children is crucial for the health and nutrition wellbeing of a child [11].

Mother's knowledge on complementary food frequency, was that children should be fed based on hunger cues, ideal complementary feeding practices comprises of adequate meal frequency

depending on whether the child is breastfeeding (WHO). Majority of the mothers were aware of the importance of enriching complementary foods and providing a diverse diet to their children. This is an important aspect in the infant and young child feeding practice as evidenced in Korogocho slum [14].

Though late initiation of complementary feeding has been identified as a cause of malnutrition more than half of the respondents in this study knew malnutrition as an outcome of late commencement of complementary feeds. Reports from other countries in Africa have also corroborated this average level of knowledge with even lower figures compared to our study [14]. This may be as a result of misconceptions that breast milk alone is sufficient even after 6 months of age

for growth and development. Most of the mothers knew that bowl and spoon were the most appropriate feeding utensils and majority used them similar to other studies in Lagos [15].

Even though appetite may be reduced during illness, continued consumption of complementary foods is recommended to maintain nutrient intake and enhance recovery Brown. Many mothers/caregivers in this study indicated that sick and those recovering illness they still continued giving complementary food. This would be probably one of the causes of low malnutrition rates especially underweight and wasting this study. After illness, the child needs greater nutrient intake to make up for nutrient losses during the illness and allow for catch-up growth. Extra food is needed until the child has regained any weight lost and is growing well again WHO.

Hygienic Practice Associated with Complementary Feeding

Hygienic practices during food preparation and feeding is critical for prevention of gastrointestinal illness (WHO). Many Mothers were knowledgeable on correct hygienic utensil for giving food to their children, but also more than half of them washed their hands especially before and after feeding the child. This trend can be closely related to their levels of education and may be more on the availability of water in urban areas.

Bottle feeding and hand feeding were practiced by few respondents. This is in contrast to what was observed in Sudan where 59.2% fed their children with their hands [16]. The lower figure obtained from this study could be because most of the respondents are in urban, educated and no longer practice traditional method of feeding. Only the level of education significantly influenced the complementary feeding practices similar to reports from other researchers [1].

Type of Complementary Food Variety group

The minimum dietary diversity (eating from at least four food groups out seven) was high among children aged 6 to 24 months. This finding is consistent with other studies from India and Nairobi which was high [17].

The importance of dietary diversity cannot be overemphasized in complementary feeding because research consistently indicates its significant and positive influence on the likelihood of adequate consumption of food nutrients. (World Health Organization)

The Nutrition Status of the Children

Stunting rates of this study were lower than national figures but in children under five years. Wasting was lower than

the national figure. This was possibly because the study considered children aged 6-24 months old and also the fact the stunting rates increases with child age. Underweight compared well with the national figure but was found to be lower than the national figure this may be due to that sequence of study showed the rate of both stunting and underweight are decreasing year by year.

Conclusion

The knowledge regarding complementary feeding among the mothers/caregivers is inadequate as there is great number of mothers, they have low knowledge, and feeding practices are inappropriate. The initiation of complementary at right time is still a challenge as many respondents initiating complementary feeding before 6 months of age and other above 6 months of age despite of knowing that it should start at 6 months but. False beliefs as well as social and cultural taboos tend to wean the child at an inappropriate age and prevent consumption of nutritious food.

Recommendation

From what observed in this study, I recommend the following it is essential to provide proper knowledge and education to mothers and caregivers regarding appropriate timing of initiating complementary feedings, complementary foods, preparation, and practices to prevent malnutrition and improve the health status of children, Health workers should continue providing proper education to mothers when they attending clinics because in this study have been seen that despite of knowing age to start complementary feeding they still delay or start before time which mostly are caused by lack of emphasis.

Ensuring that current nutrition policy interventions are translated into Action. However, the translation of those policy decisions into measurable nutrition achievements is essential to improve child health outcomes.

More study about complementary feeding based on community should be done more to assess complementary feeding and nutrition status, this is because there very few community-based studies done concerning complementary feeding.

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