IJMPR 2020, 4(3), 44-55

International Journal of Modern Pharmaceutical Research

www.ijmpronline.com

ISSN: 2319-5878
IJMPR
Research Article

SJIF Impact Factor: 5.273

FOOD SECURITY AND FOOD CONSUMPTION FREQUENCY OF LACTATING MOTHERS IN MWIKI-KASARANI, NAIROBI METROPOLIS

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Received on: 01/04/2020
Revised on: 22/04/2020
Accepted on: 12//05/2020

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ABSTRACT

Nutrition is a fundamental pillar of human life, health and development across the lifespan. A cross-sectional study was carried out among 260 of the lactating mothers living in Mwiki peri-urban Nairobi County. The population of mothers was enumerated, the sample was randomly selected. Using structured and pre-tested questionnaire information on socio-demographic, socio-economic characteristics, food security and food consumption frequency mothers. Data analyzed using SSP version 20. Results indicate majority had 36 – 40 years. Education, 44.6% primary, 16.8% secondary. Household size 6–12 average 6 persons. Meru and Luhya. Majority lower socio-economic category. Majority (42.3%) food insecure hunger, 20% food insecure moderate hunger 37.6% food secure. Majority (32.3%) reduced meals frequency, 30% manual jobs, 16.2% sold household assets, and 11.1% reduced meal size and 10.4% food aids. Significant correlation between number of meals and animal protein a co-efficient (0.002). The survey shows significant relationship between cereals, vegetables and fruits with number of meals per day correlation co-efficient (0.024 and 0.018). There was insignificant relationship between roots and tubers with a coefficient of 0.182. Positive and significant association between reduce frequency of meals and food sufficiency p=0.007; manual jobs, frequency of meals p=0.006; reduce meal size and frequency of food 0.004. Positive but insignificant relationship between food aid and sell assets p=0.442 and 0.496. Results from the focus group discussion showed lack of employment and lack of space to farm as major reasons for food insecurity in the area. Concluded that food security major concern and affected lactating mothers, infants.

KEYWORDS: socio demographic; Lactating mothers; food insecurity; food consumption frequency.

1.1 INTRODUCTION

Food security in households is an important factor since this is a parameter that indicates the nutritional status of children and lactating mothers. Household food insecurity usually defined as "limited or uncertain availability of food or limited or uncertain ability to acquire acceptable foods in culturally and sociable acceptable ways".[1] Food insecurity is usually associated with health problems among lactating mothers and their infants, among other vulnerable groups.[1,2] Food insecurity leads to consumption of energy-dense foods and high intake of foods of low nutrient density. Low income, poor food production practices and poor nutrition knowledge are key contributors of food insecurity in households.[2]

Food insecurity is also a state or a condition in which people experience limited or uncertain physical and economic access to safe, sufficient and nutritious food to meet their dietary needs or food preferences for a productive, healthy and active life. On the other hand food security is achieved when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

In Kenya there communities which have a long history of food insecurity are especially those living in urban slums with low social-economic status.[2] Research has shown that most Nairobi farmers belong to the group with low to very low incomes. The farmers' households spend a very large part of their income on food; over one third of them spend even 70 -75% of their income on food. This percentage would be even higher if these households were cut off from their farming activities, or otherwise they might starve from hunger. Few people in the farming households in Nairobi are employed in the formal sector.[3] Many are either unemployed or perform casual labor. In slum areas, informal trade and food selling were the most frequent sources of income. Among non-farming households, illegal trade and practices (like manufacturing and selling alcoholic brews, prostitution, street begging and stealing) scored high (24%) in comparison with the farmers' group (10%).[3]

Growing urbanization, rapid unemployment and poor planning and governance have resulted in mushrooming of slum settlements in major cities in Kenya and other tropical Countries. The Kenyan Central Bureau of Staticstics indicates that the proportion of people in Nairobi living below poverty line has increased from 26.5% in 1912 to 50.2% in 1997.

The nutritional status of a woman is important since it serves as an indicator of her overall health and a predictor of pregnancy outcome for both the lactating mother and her infant. This will consequently impact on the quantity and quality of breast milk the mother will produce during lactation. This will directly affect the process of growth and development of the infant.[4]

Household food insecurity is associated with several health and nutrition outcome.[5] The nutrition and health of lactating mothers affects a wide range of health and social issues, including family care and household food security. The food and Agriculture Organization of the United Nations has proposed malnutrition by 2030 as an immense. The Sustainable Development Goals (SDG) framework includes two indicators for monitoring SDG Target 2.1: the prevalence of undernourishment and (SDG Indicator 2.1.1) prevalence of moderate or severe food insecurity based on the Food Insecurity Experience Scale-FIES.[5]

People experiencing moderate food insecurity face uncertainties about their ability to obtain food and have been forced to reduce, at times during the year, the quality and quantity of food they consume due to lack of money or other resources. Moderate food insecurity therefore refers lack of consistent access to food, which diminishes dietary pattern and can have negative consequences for nutrition, health and well-being. There are lactating mothers who also face severe food insecurity are likely run out of food, experience hunger and at the most extreme, go for days without eating putting their health and well-being at grave risk.[6] The impact of economic slowdowns and downturns on food security and nutrition cannot be separated from the root causes of hunger and malnutrition: poverty, inequality and marginalization. Ending hunger and malnutrition by 2030 will require greater efforts by Countries and integrated approaches to eradicate extreme poverty, ensure growth and reduce inequalities.

The households where lactating mothers reside may be facing a reduction in purchasing power as a result of economic events and have to look for households copes with these shocks to maintain food security and consumption although these coping mechanisms or strategies may be ineffective. A household might have to take up lower paying jobs, often in the informal sector, or try to make use of any savings as a mechanism at their disposal.

Lactating mothers nutritional status is affected by factors such as reduction in habitual dietary intake which are caused by drought and pre-harvest season, increase in manual work and lack of food to consume during lactation when food consumption and requirements for quality diets increase drastically.[7,8]

1.1 Objectives of the study

1. To determine socio-economic and socio democratic characteristics of the respondents.
2. To determine the food security status of the lactating mothers in the study area.
3. To examine the food consumption frequency of lactating mothers in the study area.

1.2 METHODS

This was a cross sectional study targeting lactating mothers. The sampling unit was households. The study was the baseline which involved collection of data on food consumption, food security socio demographic and socioeconomic characteristics of lactating mothers. The area of study was Mwiki sub-ward, Kasarani ward, Kasarani sub-county. Mwiki Area is 18.8 square km. About half of the available land is used for Agricultural production. The average size of land is 50m x 50m. The main farming system is subsistence and it is usually intensive farming. Food crops grown are mainly maize and beans and horticultural crops in small quantities along the river banks,[9] A cross-sectional descriptive design was used to undertake the study. The study targeted lactating mothers 0-3 months postpartum in the households of Mwiki Kasaran, Nairobi metropolis. Lactating mothers who were under medication or had a chronic illness at the time of the study were excluded from the study. Fishers formular was used to calculate the sample size which yielded 236 with an attrition of 10% gave 260 sample size. A random sampling method was used to select households with lactating mothers 0-3 months postpartum. A list of households with such mothers was generated and interviews in such households were conducted. A structured questionnaire was used to collect data on socio demographic, socio-economic characteristics, food security and dietary practices of the respondents. Focus Group Discuss (FGD) guides were used to collect qualitative data on issues related to food security and dietary diversity of lactating mothers. The Focus Group Discussion had 8 lactating mothers, 3 men and 2 elders from the study area. The questionnaire was pre-tested on 32 households with such lactating mothers in Ngomongo Nairobi which has same characteristic as the study area. The results were not included in the final study. The purpose of the pre-test was to readjust the study tools to ensure accuracy in the data collection process. The questionnaires were translated in Kiswahili language to ensure the respondents understood all questions clearly. Food security data was collected using Household Dietary Diversity Score (HDDS) using 12 food groups.[10] The study was a baseline survey with a sample size of 260 respondents. A food frequency and food security

questionnaire was administered on such lactating mothers. Data was collected using a structured questionnaire. The qualitative and quantitative data was analysed using the (SPSS version 20) programme to generate frequencies, mean and standard deviations. Bivariate and multiple cox regression hazard ratio was done.

1.3 RESULTS

Table 1: Socio-Demographic and Socio-Economic Characteristics of the Mothers.

The age categories of the respondents are shown in Table 1.1.The minimum age of the respondents was chosen as 19 years. The maximum age was chosen as 49, years the maximum for reproductive age. The highest number of mothers fell in the range of 36-40 years. The least number of mothers were within the age ranges of 20 – 25 years and 46 years; this may indicate low tendencies to have children below age 25 and age above 46 - 49 years as per the study observation.

Table 1.1: Distribution of mothers by age categories.

Age categories (years)	Number of respondents(N=260)	Percent of mothers
20-25	18	6.7
26-30	43	16.5
31-35	45	17.3
36-40	86	33.1
41-45	52	20.1
46-49	16	6.3

Marital status of the mothers

Majority of the mothers as shown in table 1.2 were married (62.7%), Single mothers were 25.4%. The remaining mothers were either divorced or widowed and each at less than 10%.

Table 1.2: Distribution of the mothers by marital status.

Marital status	Number of respondents N=260	Percentage (%)
Divorced	16	6.2
Widow	15	5.7
Married	163	62.7
Single	66	25.4

Education level of the mothers

The education levels of the mothers are shown in Table 1.3. As the Results show that, 44.6% had primary and 40 % had secondary education. The remaining mothers had either college diploma or university degree. There were 8.1% of illiterate mothers. That means that majority of the mothers participating in the study had at least primary level education. This means that they were all capable of accessing nutrition and health information from the common sources available. The main education level attained was primary at 44.6 % which is higher than the average of 43% indicated by KDHS study.[11]

Table 1.3: Distribution of mothers by education level.

Education level	Number of respondents (N=260)	Percent of mothers
Illiterate	21	8.1
Primary level	116	44.6
Secondary (O level)	90	34.6
Secondary (A level)	14	5.4
College	17	6.5
University	2	0.8

Size of the household

The distribution of household sizes is as shown in table 1.4. In this study, the maximum house hold size was 12 while the average was 6. The number is higher compared to 3.9 the average household size in Kenya according to KDHS (2014).

Table 1.4: Distribution of mothers by household size.

Members in the household	Number of households (N=260)	Percent of households
1-5	146	56.3
6-10	94	36.2
11-15	20	7.5

Occupation of the mothers

The occupations of the mothers are shown in Table 1. 5. As Table 5 shows, there were many differing occupations among the respondents. Majority were running small businesses mainly in the informal sector at 28.6%, while 23.9% were housewives and 21.2% were farmers, probably practicing urban agriculture.

Table 1.5: Distribution of the mothers by occupation.

Occupation of the mothers	Number of mothers (N = 260)	Percentage (%)
Business	75	28.6
Housewives	62	23.9
Farmers	55	21.2
Teachers	20	7.8
Hairdresser	17	6.3
Tailor	8	3.1
House help	8	3.1
Laborer	5	2.0
Others	10	4.0

Distribution of the mothers' households by monthly income

The monthly income levels of the households in Kenya shillings (KES)* of the households are shown in table 1.5. As the Figure shows, the largest group of households had income of KES 11000 – 20000. About 27% of the families had income of between KES 1,000 – 10,000. These figures show that at least 18% fall within the lower socio-economic group of the country considering reference for cut-off of KES 15000. Also the incomes show that 68% of the households had income of less that KES 30,000 per month, and therefore lived below the World Bank poverty line of $1 a day. It is possible that this number could go down considering that the communities do not necessarily entirely depend on the monetary income especially for food. Much of the food consumed is usually grown by the households under urban agriculture.

Table 1.6: Distribution of mothers' households by income

Monthly income Categories	Number of respondents	Percentages
1000 – 10,000	39	27.2
11,000 – 20,000	103	40.6
21,000 – 30,000	24	9.4
31,000 – 60,000	28	10.2
>70,000	25	12.6

2. Household food security status

Table 2.1: Household food security status in the study area.

Household food security status	Frequency	Percent
Food secure	98	37.6%
Insecure with hunger	110	42.4%
Insecure with moderate hunger	52	20%

The results show that majority (42.3%) of the respondents were food insecure with hunger, 20% were food insecure with moderate hunger and 37.6% were food secure.

Interrelation between food insecurity and other parameters
Table 2.2: Food insecurity interaction with other parameters.

BMI of lactating, food secure and food insecure mothers.	Parameters	food insecure	Fishers exact value	p-value
Underweight	122.2(47%)	134(51.5%)	0.306	0.41
Normal	78(30%)	83(31.9%)	0.200	0.82
Overweight	59.8(23%	43(16.5%)	0.02	0.12

3. The coping mechanisms
Table 3.1: Coping mechanisms adopted by lactating mothers household in time of food insecurity.

N=260	Frequency	percent
Sell assets	42	16.2%
Food aids	27	10.4%
Manual jobs	78	30%
Reduce frequency of meals	84	32.3%
Reduce the meal size	29	11.1%

The results show that majority of the respondents (32.3%) reduced the frequency of meals, 30% did manual jobs, 16.2% sold household assets, 11.1% reduced the meal size and 10.4% got food aids.

4. Positive contributors to less food in the study area.
The respondents mentioned lack of farming space, erratic rainfall, lack of space to keep livestock as some of the factors that lead to lack of enough food in their households. The also mentioned economic hardships and lack of places to get casual jobs to their husbands as positive contributory factors to lack of food for consumption in households.

Food source and food consumption practices
Table 4.1: Depicts respondents food source and food consumption practices.

No of meals per day	Frequency
N=260	
One meal per day	13%
Two meals per day	57%
Three meals per day	30%
Total	100%
Source of food	Frequency
N=260	
Food aid	1%
Urban production	39%
Purchase	60%
Total	100%

Majority (57%) of the respondents consumed two meals per day, 30% consumed three meals per day and 13% consumed one meal per day. Majority (60% obtained their food from purchases, 39% from urban agriculture and 1% reported having gotten food from food aid.

***5.* Correlations Analysis**
Table 5.1: Correlation between number of meals per day and Uptake of various types of Foods.

Variables	Correlation coefficients with number of meals/day
Animal protein	0.003**
Roots and Tubers	0.178
Plants Proteins	0.147
Ceraels	0.025*
Vegetables and Fruits	0.017*

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

The survey shows that there was a significant correlation between number of meals per day and animal protein as shown by a co-efficient (0.002). On the other hand, the survey shows there was a significant relationship between cereals, vegetables and fruits with number of meals per day as shown by correlation co-efficient (0.024 and 0.018) respectively. However, there was a insignificant relationship between roots and tubers with number of meals per day as shown by a coefficient of 0.182.

This implies that in a day's meal, majority of the respondents consumed cereals (Maize products, millet products, sorghum products, wheat products); plants proteins (beans, cowpeas, pigeon peas, green grams, Njahi); animal Proteins (beef, eggs, milk, fish) and vegetables and fruits (Kales, cowpeas leaves, cabbage, Spinach, tomatoes, pawpaw, oranges, ripe bananas among others). However, roots and tubers (cassava, sweet potatoes and arrowroots) rarely formed part of a day's meal.

6. Correlation on coping mechanisms

Table 6.1: Correlation between Coping Measures and Food Sufficiency.

Coping Measures	Food Sufficiency
Sale of assets	0.496
Food aids	0.442*
Manual jobs	0.006**
Reduce the meal size	0.004**
Reduce the frequency of meals	0.007**

The study shows that there was a positive and significant association between reduce frequency of meals and food sufficiency at p=0.007; and manual jobs and frequency of meals at p=0.006; reduce meal size and frequency of food at 0.004.The study also showed a positive but insignificant relationship between food aid and sell of assets at p=0.442 and 0.496 respectively. This implies that reduction of number of meals consumed in the lactating mothers household served as the strategy as a coping mechanisms to food insecurity.

7. Food Consumption Frequency

The frequency of food consumption by the mothers is shown in Table 3.7. As the results show, the most frequently consumed grains by the mothers were maize and rice. Wheat products were consumed at a frequency of 20% daily and at 12 % 3 to 6 times a week. These consumptions were probably in bread and chapattis. Root crops (potatoes, sweet potatoes and arrow roots) were consumed at average frequency of 12% daily. These foods therefore made significant contribution to energy intake. However this frequency differed with time, Irish potatoes were consumed at 18% 3 to 6 times a week compared to sweet potatoes that were consumed at a frequency of 16% 1-2 times a week while arrow roots were consumed at a frequency of 12% once a month.

Pigeon peas were commonly consumed legumes and pulses daily at a frequency of 20% followed by ground nuts at a frequency of 10% daily. It was noted that most lactating mother fed on at least one of the following 1 - 2 times a week: pigeon peas, green grams and ground nuts. These foods were probably the main source of protein and were augmented by the little products eaten. Carrots were the most frequently consumed vegetables at 24% daily while tomatoes, amaranth, night shade and cowpea leaves were taken at least 4-6 times per week. Except for tomatoes, the other vegetables are good sources of vitamin A, and the leafy vegetables are rich sources of iron and zinc (Norman and Steyn, 2016). Kales and spinach are also good sources of vitamin A and minerals and were consumed at a frequency of 12 % at least 1 to 6 times a week.

Eggs had the highest frequency of consumption compared to other chicken and beef. Their frequencies stood at 44% daily, 34 % 3 to 6 times a week and 10% 1 to 2 times a week. Beef and chicken meats had a low consumption at 10% daily for beef. Goat meat was consumed at frequencies of 8% and 12% 3 to 6 times a week and 1 to 2 times a week respectively. Chicken and fish were the least consumed meats at a frequency of 10 % once a month. That means the contribution of protein intake by meats was low.

Avocado fruit was the highest consumed at frequencies of 16% daily, 12% 3 to 6 times a week and at 10% 1 to 2 times a week.

Fresh milk was the highest consumed dairy product at frequencies of 92% daily and at 4% 3 to 6 times a week while other daily products had very little consumption. The high frequency of consumption of fluid milk was probably that used with tea daily.

Table 7.1: Frequency of food consumption among lactating mothers.

Food item	Frequency (%)			
	Daily	3-6 times a week	1-2 times a week	Once a month
Grains				
Wheat	20	12		
Maize		18		
Rice		10	12	
Starch roots				
Irish potatoes	12	18		

Sweet potatoes	12		16	
Arrow roots	12			12
Legumes, pulses and nuts				
pigeon peas	10	10	18	24
Green grams	20		24	
Ground nuts		10	10	10
Vegetables				
Traditional leafy vegetables (Amaranth, night shades and cow pea leaves)	12	0	6	0
Carrots	24	0	0	0
Tomatoes	12			
Kales and spinach		12	0	0
French beans		8	22	
Meats and eggs				
Beef	10	0	0	0
Chicken	10			
Goat		8	12	
Fish				10
Eggs	44	34	10	
Fruits				
Avocadoes	16	12	10	0
Dairy products				
Fresh milk	92	4	0	0
Yoghurt		8	18	14

Table 15: Correlation between some socio-demographic characteristics and food security.

Variables	food security
Education	0.136
Occupation	0.013**
Age	0.018*
Income	0.363
Ethnicity	0.341

Correlation between the different characteristics is shown in table 3.15. The results from the study shows that there is an associations among number of people living in household and occupation of mothers; number of people living in household and monthly income; number of people living in household and age of the mothers; occupation of mothers and age of the mothers. These were significant at $p \leq 0.1\%$. The monthly income and age of the mothers were highly correlated at $p \leq 0.05$ percent.

8. Focused Group Discussion

The discussion was held at Mwanamukia area using 8 elders and 12 lactating mothers with children 0-3 postpartum. The results showed that most of lactating mothers did not get enough food after delivery for them to sustain exclusive breastfeeding for the recommended 4-6 months by WHO (2004). The discussion cited lack of enough rainfall to sustain dry land crop production and lack of space for farming and poor seeds since they cannot afford to buy certified seeds for planting. Some of the seasons there is lack of food in the households. They also cited unemployment for the youth who at times steal their vegetables when they plant them along the maji mazuri river and Kiuu river. They said the two rivers also get polluted upstream and this makes the water unsuitable for irrigation.

They cited strategies like casual labor, reducing number of meals per day, reducing the portion size, getting food aid from the government and non-governmental organizations and church based organizations and sale of assets in the households in times of food shortage as some of the coping mechanisms employed. Planting of drought tolerant crops such as cassava and sweet potatoes were also cited as coping mechanisms employed to curb food insecurity by lactating mothers.

They suggested that if the government can provide them with certified seeds and provide them with food aids in times of drought then they can cope better with food insecurity.

DISUSSIONS

Age

The results in this study show that majority of the respondents were young people. As it appears, urban farming is not restricted to certain age groups as stated by Awuah.[12] It is however most probable that since urban agriculture is small scale and far from having commercial drive, majority of the farmers are women.

A study in Ghana found that 63% percent of the urban farmers were in the age bracket of 21-40 years.[12] In this study, the farmers in the age range 20 – 40 years were 73.6%. In Namibia as well, majority of the respondents 66.3% were young people falling in the age range of 21-40.[13] A study in Eldoret, the mean age of urban farmers was 28 years.[14] In Gweru city, Zimbabwe, the average age was 41 years[15,16] working in Nasarawa state Nigeria found that the mean age of the farmers was 50 years, although 35.56% were within the age range of 41–50 years followed by those within the range of 51–60 years at 24.44%. In their study Yusuf *et al.,* (2015) found that the majority of farmers (76.1%) were aged 41-60 years. In Accra Ghana, 83% of the farmers were aged 40 years and over, only 17% were between 20-29yrs of age. None of the farmers was below 30 years,[17] It is however most probable that since urban agriculture is small scale and far from having commercial drive, majority of the farmers are women.

Marital Status

Majority were married (62.7%), Single mothers were 25.4%. The remaining mothers were either divorced or widowed and each at less than 10%. The marital status of the mothers was shown to contribute to their nutritional status. Most married lactating mothers had an overweight BMI.This could have been attributed to the fact that their partners were able to provide them with food. Also married lactating mothers had husbands who probably were able to buy high quality and nutritious food for them compared to their counterparts who solely depended on themselves as bread winners for themselves and their family despite their lactating conditions.

Results of a study in Nigeria compare quite well with those of the current study where 90% of the respondents were married and only 7.78% were single.[16]

However, a study in Namibia found that only 23.4% of the respondents were married while 58% respondents were single, 13.5% were cohabiting, 4% divorced and 6% separated Dima *et al.,* (2002). In Samre Woreda, Ethiopia, 92.3% of the respondents were married, 5.8% divorced and 2% widowed.[18] Again in Ibadan, Oyo states, Nigeria 90.9% of the farmers interviewed were married.[19]

Education Level

There were very few numbers of illiterate mothers contributing to 8.1% of the respondents. That means that most the mothers participating in the study had at least primary level education and that they were capable of accessing nutrition and health information from the common sources available. Most mothers with a higher education level had a normal BMI.

A study in Nigeria by,[16] reported that 33.33% of the respondents had primary education, while 22.22% had secondary education. A study in Kumasi Ghana showed that 67% of the respondents had dropped out or completed basic education Ackerson and A study in Eldoret, Kenya showed that the respondents with primary education level of education were 25% and Secondary 15%,[14] 13Another study in Nigeria showed that majority of the respondents (50.5%) had tertiary education while 25.4% had only secondary.[19] In Accra Ghana a study showed that 33% of the respondents had primary education, 37% secondary and only 6% had Tertiary education.[14]

Household Size

The household size in this study was higher compared to 3.9 the average household size in Kenya according to.[11] Larger households have a higher demand on family income and are thus using their resources to produce own food.[17] In Ibadan, Oyo state, Nigeria, majority of the respondents (92.3%) had a household size of 4-8.[17] The household size affects the nutritional status of lactating mothers as seen in table 10 where lactating mothers households with the highest number of members, had lactating mothers who were underweight 29% and household whose members were less had 80% of lactating mothers with normal BMI.

In Pretoria, South Africa the average household counted 4.4 members.[20] In a study in Eldoret, the Mean household size was also 4.[14] In Gweru city, Zimbabwe, the average household size was 4.62 (Admire, 2014). In a study in Namibia, majority of respondents had household sizes ranging from 3 to 8 persons. In Windhoek 76% of the respondents had family sizes of 3-8 persons, 22% had less than 3 persons per household and only 2% had members greater than 8. In Oshakati the respective figures were 71% with 3-8 persons, 11% with less than 3 persons and 18% with more than 8 persons living in their families.[13]

Occupation

Majority of the respondents in this study were small s cale business people (28.6%) in the informal sector and housewives (23.9%).These findings concur with those of,[21] who established that farming activities in the urban areas were mostly carried out on a part time basis by people in other livelihoods. Their participation in urban agriculture was to supplement their family food or income. These results concur with the result of a study done in Kibera a slum in Nairobi by,[22] where the respondents used sack gardening as a source of income and home consumption. This study agrees with research conducted by the Planning Commission and the Ministry of Labor and Youth Development of Daresalaam which

found that, about 30% of the urban population gains an income in the informal sector and about 6.5% of the informal urban workforce works in urban agriculture. Found,[21] that, for 90% of interviewed periurban farmers, agriculture was their primary economic activity. Farming was the primary occupation of most (90%) farmers, although they all had other sources of supplementary income, such as trading and teaching.[17]

The results of.[16] showed that majority (63.33%) of the respondents were civil servants, 22.22% with trading as their major occupation while 14.45% were full time farmers. In Zimbabwe, Mudzengerere's study.[23] showed that 55% of the respondents were unemployed whilst 24% worked in the informal sector. Only 13% were formally employed. In total, 87% of the interviewed people were unemployed and they were dependent on the informal sector for employment. In Pretoria, South Africa the contribution to mean total household income of employment was 67.1%, public welfare grants 16.0%, service provision 7.2%, trade 7.0%, transfers by kin 2.5% and agriculture 0.2%.[20]

Prevalence of food insecurity

The study revealed a prevalence of food insecurity at 42.4%. Majority of the respondents were food insecure with hunger at (42.4%) and food insecure with moderate hunger at (20%). Lactating mothers whose households were food insecure were more likely to be undernourished than those whose households were food secure. The results could be due to the fact that, women from food insecure households play a greater role in ensuring that there is food for everyone especially the children. This sacrificial role played by women makes them vulnerable to malnutrition. These results concur with the results of a study done in Malawi by.[24] which found out that the household food security was also one of the socioeconomic factors which was independently associated with undernutrition of the mothers of reproductive age. Maternal nutrient needs increase adversely during lactation due to the breastfeeding role, and when these needs are not met, lactating mothers may experience wasting, psychological disturbance, sociological vulnerability and fatigue. Moreover lactating women are vulnerable due to their caregiving role in households.[25] The percentage of people who were food insecure in this study is larger than that of a study done in Malasyia,[26] which found 29.6% of the household members experiencing food insecurity. This research differs from the study done in Northern Ghana,[27] which found the prevalence of moderate and severe hunger was 25.9% (95% CI: 19.0, 34.3) AND 6.8% (95% ci: 4.2, 10.9) respectively. In their study,[27] found majority (77.5%) of households experienced some degree of food insecurity in the month prior to the survey. In their study most mothers over 60.0% reported worrying about not having enough food in the household and another 60% reported having to eat a limited variety of foods due to lack of resources to buy food in the past 30 days. They also reported 55.2% of household having to eat fewer meals in a day because there was not enough food, and 35.8% were reported to go to sleep at night hungry because of lack of enough food while 18.4% of the same study went for a whole day without food.

Food sources and feeding practices

The food source and feeding practices depicts that majority of the respondents consumed two meals per day 57%, one meal per day 13% and three meals per day 30%. Most women reported their source of food to be purchase 60% and 39% from urban production while 1% obtained food from food aid. This study differs with a study done in Tigray, Ethiopia, by which found that about two-thirds of lactating mothers (60.7%) reported less than three meals per day during the previous 7 days. In terms of food source the current study differs from the study of,[28] in that, while lactating mothers in this study obtained their food from purchases 60%, the ones on,[28] in TIgray obtained their food from own production from home gardening (42.3%.

Copping mechanisms employed in times of food scarcity

Mechanisms employed during time of food scarcity in lactating mothers household in the study included reducing frequency of meals 32%., manual jobs 30%, sale of assets 16.2%, reducing meal size (11% and looking for food aids 10.4% respectively. This study differs with a study done in Vaal South Africa by,[29] which revealed that the coping strategies employed by lactating mothers in times of food insecurity as 80% of the study population was limiting portion size, 74.7% were limiting variety of food served, 68.4% were skipping meals and 75.8% was maternal buffering. Due to the element of eating less or skipping meals due to the status of food scarcity in the households, end up over eating when food become available. This usually results into chronic ups and downs in the food intake which can contribute to rapid weight gain.[30] Regular eating is essential for the body's wellness and equitable distribution of nutrients in the body cells. On the other hand cycles of food restriction or deprivation either due to food shortage or otherwise can lead to disordered eating behaviors, metabolic changes which promote fat storage and unhealthy preoccupation with food and this becomes worse when combined with overeating (Seligman *et al*.,2015). Unfortunately, overconsumption is even easier given the availability of cheap, energy-dense foods in low-income communities.[31] The "feastor famine" situation is especially a problem for low-income parents, particularly lactating mothers, who often restrict their food intake and sacrifice their own nutrition in order to protect their children from hunger.[32,33] The coping mechanisms employed by respondents puts them at risk for obesity, a research done in USA by,[34] shows that parental obesity, especially maternal obesity, is in turn a strong predictor of childhood obesity.

The study shows that there was a positive and significant association between reduce frequency of meals and food

sufficiency at p=0.007; and manual jobs and frequency of meals at p=0.006; reduce meal size and frequency of food at 0.004.The study also showed a positive but insignificant relationship between food aid and sale of assets at p=0.442 and 0.496 respectively.

Respondents with Low dietary diversity were more likely to be undernourished and also came from food insecure with hunger households. This is consistent with the results of a study done in Iran in which participants with scores ≥6 had greater body mass index, waist circumference, and waist- hip ratio than in individuals with scores less than 6.[8] This study is also similar to a study done in Kenya that showed that pregnant women who had better dietary diversity had greater macro- and micronutrient intake when compared to those with low dietary diversity.[35] A study done in rural Cambodia and a study done in rural populations of Kilosa District, Tanzania indicated that there is no association between food security and dietary diversity.[36,37] However a study done in OLDER Taiwanese has indicated that there is significant association between food security and dietary diversity.[37]

Food consumption frequency

The state of low dietary diversity in the study respondents could be attributed to the increasing food insecurity with hunger which was largely due to reductions in all types of animal-source foods, this is particularly dairy products and fish. Lactating mothers reported having consumed these foods less frequently and same mothers were from food insecure households. This study is in consistent with a longitudinal study conducted in rural Bangladesh by,[38] which reported a decline in maternal dietary diversity with increasingly severe household food insecurity due to reductions in consumption of all types of animal protein foods. In this study carrots were the most consumed vegetables followed by amaranth and other green leafy vegetables. This means lactating mothers benefited from nutrients such as vitamin A and other vitamins. Carrots are rich in vitamin A,[38] This benefit was however not accrued by food insecure households which did not enjoy the privilege of consuming such foods. This study is in agreement with a study done in Napel,[39] where women in household insecure status only consumed vegetables <1 time/week. Cereals were commonly consumed in households which were food insecure. This is because in the study area which is a slum area, purchasing carbohydrates rich foods is easier since they are cheaper and readily available. These results are consistent with the results of a study done in Bangladesh by,[39] which noted that in cases where food budget is high households which are food insecure tend to purchase more of cereals and carbohydrates rich foods rather than their dietary diversity contributing food groups. This study also agrees with a study done in Malawi.[40] which found that food insecurity was associated with low dietary diversity among lactating mothers. The survey shows that there was a significant correlation between number of meals per day and animal protein as shown by a co-efficient (0.002). On the other hand, the survey shows there was a significant relationship between cereals, vegetables and fruits with number of meals per day as shown by correlation co-efficient (0.024 and 0.018) respectively. This study agrees with a study done in Kelantan, Malaysia which found that food-secure households had a significant higher expenditure on total food (p<0.05), which include expenditure on fruits and vegetables (p=0.011), animal source food (p=0.028) and milk and dairy products (p=0.047).

However, there was an insignificant relationship between roots and tubers with number of meals per day as shown by a coefficient of 0.182 in this study. This agrees with the similar study done in Kelantan, Malaysia, in households which were food insecure which revealed that mothers had a lower diet diversity scores on grain and cereals and tubers giving (OR=0.99; 95% C,I, 1.00; P,0.05),[40]

Results from the focused group discussion revealed that lactating mothers from the study area suffered from food insecurity which made them give their infants complementary feeds before 6 months as per recommendation by.[41] It also came out that most of the mothers were going out to do manual jobs with infants as young as two weeks so that they could acquire money food to eat during the period they were breastfeeding. They said they did such jobs as cleaning clothes for their able neighbors, digging shambas (farms) for their neighbors and sometimes trekking long distances covering over 2 kilometers to go and look for jobs. Those that were saloonist before delivering went back to the jobs in two weeks' time after delivery to get money to be able to buy food stuffs for themselves and the family.[7]

CONCLUSION

The prevalence of household food insecurity in lactating mothers' case has reached high and alarming scale. Inadequate dietary intake in low-income households with lactating mothers is observed as direct and indirect consequences of food insecurity in households. There is low dietary diversity, food insecurity and lactating mothers consumed less than three meals per day. Lactating mothers from low socio-economic background were more likely to be food insecure.

RECOMMENDATIONS

These findings suggest the importance of coupling education with other poverty alleviation strategies to improve nutritional outcomes in lactating mothers' households

ACKNOWLEDGEMENTS

I take this opportunity to thank God almighty for his care and protection. Special thanks goes to my dear husband Patrick Miriti for his care, love and for funding this study. May the lord God bless you and add to your

bounty. I thank my children Malcolm and Carol for their support and words of encouragement and editing my work. Thank you lactating mothers for your cooperation during the study and community members for your cooperation.

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