

Original Research Article

Complementary Feeding Practices of Children 6-23 Months of Age Whose Fathers Consumed Illicit Alcohol in Kirinyaga County, Kenya

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ABSTRACT

Background: The first two years are a “critical window” for ensuring optimal growth and child development. Improving infant and young child feeding practices such as frequency and diversity is therefore critical to improve nutrition, health and development. Children in this age category are considered vulnerable because of their increased nutrient needs. Poor complementary feeding practices among children 6-23 months of age have been attributed to fathers’ illicit alcohol consumption. The purpose of this paper was to determine complementary feeding practices of children 6-23 months of age whose father consumed illicit alcohol in Kirinyaga County, Kenya. This study adopted cross-sectional analytical study design. It adopted quantitative approaches in data collection, analysis and presentation. A sample of 239 households participated in the study in Mwea-East Sub-County. A researcher administered questionnaire was used to collect socio-demographic and socio-economic information. A standard questionnaire was used to collect information on Infant and Young Child Feeding. The data was analysed using SPSS software. Statistical significance was set at p values less than 0.05. Based on the findings, of the 230 children 6-23 months of age, two thirds (66.6%) were still breastfeeding and a third (33.4%) were discontinued. Minimum dietary diversity was indicated by consumption of four or more than four food groups. Majority of the children (86.1%) attained a minimum dietary diversity while minimum meal frequency was attained by most of the children (93.5%). Minimum meal frequency of 3 or more food groups was considered adequate. Minimum acceptable diet was attained by (85.2%) while those who did not attain minimum acceptable diet were (14.8%). The food consumption patterns were grains, roots and tubers was (90.9%) which were most commonly consumed while other fruits and vegetables was (43.9%) eggs (7.0%) and dairy foods (6.1%). The major occupation for fathers was casual labour (71.7%), Monthly income was between 5001-10000KES (48.7%), alcohol expenditure per week was between 250-500KES (46.1%), while fathers food expenditure per week was <1750KES (88.3%). Food expenditure had a positive correlation with complementary feeding. In this study there was evidence that children 6-23 months of age attained minimum meal frequency, dietary diversity and minimum acceptable diet. However the food consumption patterns were low especially for animal sources and vitamin A rich foods. Food expenditure as well as alcohol expenditure has shown to influence complementary feeding practices.

Key words: Illicit alcohol consumption, Complementary feeding practices

INTRODUCTION

The consumption of illicit alcohol has been on the increase among Kenyans (National Agency for the Campaign against

Drug Abuse [NACADA]),^[1] There are 3 categories of illicit alcohol in Kenya according to the World Health Organization (WHO).^[2] These are; fermented alcohol

with a low alcohol content of 3-7% by volume which includes busaa (green beer), mnazi (palm wine) and muratina from a local fruit called muratina made with sugarcane and honey. The second classification is distilled liquors: spirits such as chang'aa which have a high alcohol content of 20-50% and the third classification is methylated brews made by mixing non-beverage alcohols such as methanol, butanol and propanol with other ingredients. [2] The WHO estimates that 2 billion (33%) people consume alcoholic beverages worldwide. [2] Globally, the United Nation of Drug Abuse (UNODA) estimates that between 155 and 250 million people (3.5% - 5.7%) aged 15-64 years used illicit substances at least once in 2008. [3] Nationally, 13% of the Kenyan population consumed illicit alcohol. [4] The NACADA conducted a cross sectional survey to determine the prevalence of consumption of illicit alcohol among males. This survey revealed that 40.2% of male in Kirinyaga consumed illicit alcohol and as such was ranked third out of the seven districts in the central province. [1] Another study by NACADA among the same districts in Central Kenya, reported that the level of usage ranged from a low of 51.5% in Nyandarua to a high of 75.4% in Kirinyaga. [1]

Two different studies by NACADA provide an evidence based exposition of the effects of illicit alcohol in Kenya, where it is rampant especially in slums, rural areas and among the youth. Drinking of illicit alcohol starts early in the day and cases of mysterious deaths, blindness and arrests from methanol poisoning are common as the illicit alcohol contains dangerous additives for potency. [1,4] The illicit alcohol is prepared, stored and consumed under unhygienic conditions despite the Alcoholic Drinks Act of 2010, which seeks to protect drinkers' health and control drinking hours. [1,4] The consumption of illicit alcohol is significantly high in households with low income and low education cadres and this contributes to diversion of family resources

into illicit alcohol drinking which adversely affects the expenditure on food and consequently on complementary feeding and the nutrition status of children. [5] A study by [6] in Nairobi established that illicit alcohol had a negative effect on families as it led to family break ups, domestic violence, lack of education for their children and child labour.

The period from birth to two years is a "critical window" for the promotion of optimal growth and development. [7] In 2015, the WHO launched the Sustainable Development Goal (SDGs) which seeks to eradicate poverty in all its forms and dimensions for sustainable development by achieving goal 2 that aims at ending all forms of malnutrition especially stunting and wasting for under five years of age by 2025. There is therefore need to improve feeding practices. A study by [8] in Kibera indicated that most families diverted the money that was meant for food to drinking which led to increased poverty levels and possibly a poorer nutrition status in these families. It is against this background that the study aimed to assess paternal illicit alcohol consumption and complementary feeding practices of children 6-23 months of age.

MATERIALS AND METHODS

Research Design and study location

The study adopted a cross-sectional analytical design with quantitative and qualitative in data collection analysis and presentation. The design was suitable in establishing associations between alcohol expenditure and complementary feeding, food expenditure and alcohol expenditure. Data was collected in the months of August, September and October 2016.

The study was conducted in Mwea East Sub-County, Kirinyaga County. The major economic activity is rice farming in MweaTebere Irrigation scheme. This study area was purposively selected because of the high prevalence of illicit alcohol consumption among males which affects the food expenditure and this further affects the

food consumption and the nutrition status of children. Minimal studies have also been done. [3]

Study population

The study targeted the households in which fathers consumed illicit alcohol 7 days prior to the study and had consumed some in the previous 24 hours with children 6-23 months of age in Mwea East Sub-County Kenya and were willing to participate were included in the study. Mothers and fathers were the primary respondents. The study excluded households with children who were chronically ill as this chronic illness could affect food intake, digestion, absorption and utilization. These conditions were determined by child health records, observation or reports from the mother/caregiver.

Sample size and Sampling technique

The study adopted the Fisher [9] formulae as cited in. [10] A total of 234 households were eligible to participate in the study. Kirinyaga County was purposively selected as it records a high prevalence of 40.2% in illicit alcohol consumption. [4] Mwea East Sub-County was purposively sampled because it is a cosmopolitan area with diverse population covering urban, peri urban and rural communities. Two wards out of four existing wards which are Murinduko, Gathigiriri, Nyangati and Tebere were also selected using simple random sampling techniques. The villages in the selected locations were selected using simple random sampling technique. Eligible households were sampled with the assistance of Community Health Volunteers (CHVs) who provided a list of households with fathers who consumed illicit alcohol and had children 6-23 months of age. From that list, participating households were random selected. Data is reported on a sample of 230 respondents.

Data Collection Procedures

A validated and pre-tested researcher-administered questionnaire was used to collect data. The 24 hours recall was used to gather information on various foods

and drinks consumed in the previous 24 hours. Dietary diversity score collected data on the number of food groups consumed in the past 24 hours by the child in the seven food groups as recommended by WHO [11] namely; grains, roots, and tubers; legumes and nuts; dairy products; flesh foods (meat, fish, poultry and organ meats); eggs; vitamin A fruits and vegetables; other fruits and vegetables.

A dietary diversity score of 0-3 food groups were classified inadequate and those that consumed 4 or more food groups were considered adequate. Minimum meal frequency was determined by the number of times a child was fed in a day. Adequate meal frequency was 3 times or more while inadequate meal frequency was less than 3 meals in a day. Minimum acceptable diet was determined by the number of children who met both minimum dietary diversity and minimum acceptable diet. Breastfeeding practices were used to gather information on initiation within an hour after birth. Continued breastfeeding was done in the past 24 hours for children 6-23 months.

Data collection tools

The researcher administered questionnaire and data collection procedures were pre-tested at an area with similar characteristics in Mwea-West Sub-County, Kirinyaga County. The researcher administered questionnaires were used to collect socio-demographic and socio-economic information which were validated by University experts from Kenyatta University in the department of Food, Nutrition and Dietetics. The standard FAO (Food and Agricultural Organization) for IYCF (Infant and Young Child Feeding) collected information on feeding practices which are already validated. The information was collected using face to face interviews. The demographic and socio-economic data collected included: age, sex, occupation, expenditure patterns, household head, income source and sex of the household head.

The procedures that were used in pre-testing were similar to those used during

the main study, where the participants had similar characteristics. A total of 24 households participated in the pre-test and were therefore excluded from the main study. The correlation coefficient was determined using Cronbach formula. [12] The test-retest method was used to test for reliability where similar questionnaire was administered twice to the same participants and after two days the results were compared. In this study a correlation coefficient of 0.92 was achieved. A correlation coefficient of 0.92 (95% CI: 0.87-0.97) was obtained which is considered adequate. [10]

Data Analyses

The collected data was cleaned and checked for completeness. Microsoft Office Excel for Window 2007 was then used for creating tables and figures of the analyzed data. Dietary practices data from 24 hours recall was analyzed using Nutri-survey for Windows 2007. The information was then used to obtain the percentage adequacy.

After all forms of analyzed data had been entered, statistical analysis was conducted using the SPSS (statistical Package for Social Sciences) version 22. Descriptive statistics such as percentages, frequency distribution and measures of central tendencies were used to describe the socio-economic and demographic characteristics of households. A Pearson product-moment correlation was run to determine the relationship between: alcohol expenditure and complementary feeding practices; paternal food expenditure and complementary feeding practices among children 6-23 months of age. Pearson Chi-square test was run to establish the association between: fathers illicit alcohol consumption, food expenditure and complementary feeding practices of children 6-23 months of age. Significance levels were then determined at 95% confidence interval and a p- value of < 0.05 was used as the criteria for statistical significance.

RESULTS

The study had a sample size of 239 but 230 households responded. The results presented here are based on 230 households with children 6-23 months of age whose father consumed illicit alcohol were available and had valid data for all the variables examined during the study period. Nine questionnaires were incomplete resulting to a response rate of 96%. This is considered adequate. [10]

Demographic characteristics of children 6-23 months of age

There were more female children (53%) compared to males (47%). The mean age was 13.06±5.47months with (32.6%) being mean between 9-12 months of age. Those within the age brackets of 13-18 months and 6-8 months comprised 24.8% and 23.0% respectively, while those aged 19-23 months made up 19.6% of the participating children (Table 1).

Table 1: Demographic characteristics of children 6-23 months of age

| Characteristics | N=230 | | |
|------------------------|-------|------|------------|
| | n | % | Mean ± SD |
| Sex | | | |
| Male | 108 | 47.0 | |
| Female | 122 | 53.0 | |
| Age in complete months | | | |
| 6-8 | 53 | 23.0 | |
| 9-12 | 75 | 32.6 | |
| 13-18 | 57 | 24.8 | |
| 19-23 | 45 | 19.6 | |
| Mean ± SD | | | 13.06±5.47 |

Fathers socio-economic characteristics

Nearly three quarters (71.7%), of the fathers' depended on casual labour as their main source of income while the minority were on formal employment (0.9%). More than half (58.7%) of the households had one dependent child below five years on the fathers' income while the least had three children under five years (2.6%) who depended on fathers' income. Income dependency within the age bracket of 5-18 years recorded high with (59.1%) where none was dependent on fathers' income followed by (35.7%) of households had only one person who depended on fathers' income and (3.5%) had two persons who were dependent. The least dependents on

the father's income in the age category of 5-18years were 1.7%.

From the study findings, majority (91.3%) had a one adult dependant on the father's income while the least (0.9%) had two adult dependants. About a half (48.7%) reported a monthly income between KES 5,001-10,000 while about a fifth (20.9%) earned between KES10,001-15,000. Nearly a fifth (19.6%) earned ≤5,000 KES while 6.1% earned >20,000KES and 4.8% earned between 15,001-20,000 KES. About a half (46.1%) of fathers spent between 250-500 KES on alcohol, while 33% spent less than 250 KES, a tenth spent between 501-750KES, 8.3% spent between 751-1000 while 2.6% spent less than 1000KES. Slightly more than two thirds of fathers (67.4%) spent less than 1750KES per week on food while 32.6% spent more than 1750KES per week.

The majority of the households were male headed (86.1%) (Table 1). Sixty-three percent (63%) of the households depended on casual work as their major source of income. The majority of mothers (88.3%) spent less than 250KES on food per week while 11.7% spent more than 250KES in a week. Buying was established as the main source (85.7%) of food procurement. Mothers were the major food providers for the child with close to two-thirds (61.3%) while fathers' provision was 37.8%. Fathers were the main food providers for the household with (84.3%) as shown in (Table 2)

Nearly all the respondents (98.7%) were Kikuyu while only a few were Kamba (0.9%) and Embu 0.4%. More than three quarters (80%) were protestants while a fifth (20%) were catholics. In the current study, more than two-thirds had attained primary education level (69.1%), while almost a third (30%) of mothers had attained a secondary level of education. There was an equal representation (0.4%) among those who had never gone to school and those who had attained a college education. Nearly all (98.7%) mothers were not

consumers of illicit alcohol as only a few (1.3%) consumed illicit alcohol (Table 3)

Table 2 Fathers socio-economic characteristics

| | N=230 | |
|--|-------|------|
| Characteristics | n | % |
| Main occupation | | |
| Casual labour | 165 | 71.7 |
| Own business | 48 | 20.9 |
| Formal employment | 2 | 0.9 |
| Farming | 15 | 6.5 |
| Income dependency by children below five years | | |
| 1 | 89 | 38.7 |
| 2 | 135 | 58.7 |
| 3 | 6 | 2.6 |
| Income dependency of people ages 5-18years | | |
| 0 | 136 | 59.1 |
| 1 | 82 | 35.7 |
| 2 | 8 | 3.5 |
| 3 | 4 | 1.7 |
| Income dependency for adults >18 years | | |
| 0 | 18 | 7.8 |
| 1 | 210 | 91.3 |
| 2 | 2 | 0.9 |
| Total monthly income in(KES) | | |
| ≤5000 | 45 | 19.6 |
| 5001-10000 | 112 | 48.7 |
| 10001-15000 | 48 | 20.9 |
| 15001-20000 | 11 | 4.8 |
| ≥20000 | 14 | 6.1 |
| Fathers alcohol expenditure per week in(KES) | | |
| ≤250 | 76 | 33.0 |
| 250-500 | 106 | 46.1 |
| 501-750 | 23 | 10.0 |
| 751-1000 | 19 | 8.3 |
| ≥1000 | 6 | 2.6 |
| Fathers food expenditure per week in(KES) | | |
| <1750 | 155 | 67.4 |
| ≥1750 | 75 | 32.6 |

*Key: 1USD=100 KES

Table 3: Maternal socio-economic and demographic characteristics

| | N=230 | |
|------------------------|-------|------|
| Characteristics | n | % |
| Ethnicity | | |
| Kikuyu | 227 | 98.7 |
| Kamba | 2 | 0.9 |
| Embu | 1 | 0.4 |
| Religion | | |
| Catholic | 46 | 20.0 |
| Protestant | 184 | 80.0 |
| Level of education | | |
| No formal education | 1 | 0.4 |
| primary School level | 159 | 69.1 |
| Secondary School level | 69 | 30.0 |
| Tertiary level | 1 | 0.4 |
| Alcohol consumption | | |
| Yes | 3 | 1.3 |
| No | 227 | 98.7 |

The majority of the households were male headed (86.1%), while only a few of the households (13.9%) were female headed. Sixty-three percent (63%) of the households depended on casual work as their major source of income, while slightly

less than a third (28.3%) were self-employed, only 8.3% were not in any form of employment and only 0.4% were employed formally. The majority of mothers (88.3%) spent less than 1750 KES on food per week while 11.7% spent more than 1750 KES in a week. Buying was established as the main source (85.7%) of food procurement; the rest obtained food through farming and donations; 13.5% and 0.9% respectively. Mothers were the major food providers for the child at close to two-thirds (61.3%) while fathers' provided for 37.8% and 0.8% was mainly provided for by relatives. For the household, fathers were the main food providers for 84.3%, while mothers provided for 15.7% of the household (Table 4).

Table 4: Household Characteristics

| Table 4: Household Characteristics | | |
|-------------------------------------|-------|------|
| Characteristics | N=230 | |
| Characteristics | n | % |
| Sex of the household head | | |
| Male | 198 | 86.1 |
| Female | 32 | 13.9 |
| Source of income | | |
| Casual work | 145 | 63.0 |
| Self employed | 65 | 28.3 |
| Formally employed | 1 | 0.4 |
| Employed | 19 | 8.3 |
| Food expenditure per day | | |
| ≤250KES | 203 | 88.3 |
| ≥250KES | 27 | 11.7 |
| Household source of food | | |
| Farming | 31 | 13.5 |
| Buying | 197 | 85.7 |
| Food aid/donation | 2 | 0.9 |
| Provider* of food for the child | | |
| Father | 87 | 37.8 |
| Mother | 141 | 61.3 |
| Relative | 2 | 0.8 |
| Provider* of food for the household | | |
| Father | 194 | 84.3 |
| Mother | 36 | 15.7 |

*Provider: Refers to a household member who is the breadwinner and brings food home or contributes the largest percentage of income used to access food

**Key: 1USD=100 KES

Expenditure patterns

About a half (48.7%) reported a monthly income between Kenya Shillings (KES) 5,001-10,000, while about a fifth (20.9%) earned between KES 10,001-15,000. Nearly a fifth (19.6%) earned less than 5,000 KES while 6.1% earned more than 20,000 KES. About a half (46.1%) of the fathers spent between 250-500 KES on alcohol on a weekly basis, while 33% spent

less than 250 KES. Ten percent spent between 501-750 KES, 8.3% spent between 751-1,000 KES while 2.6% spent less than a 1000 KES on alcohol. Slightly more than two thirds of fathers (67.4%) spent less than 1750 KES per week on food while 32.6% spent more than 1750 KES per week (Table 5)

Table 5: Expenditure patterns

| Table 5: Expenditure patterns | | |
|--|-------|------|
| Characteristics | N=230 | |
| Characteristics | n | % |
| Total monthly income in(KES) | | |
| ≤5000 | 45 | 19.6 |
| 5001-10000 | 112 | 48.7 |
| 10001-15000 | 48 | 20.9 |
| 15001-20000 | 11 | 4.8 |
| ≥ 20000 | 14 | 6.1 |
| Fathers alcohol expenditure per week in(KES) | | |
| ≤250 | 76 | 33.0 |
| 250-500 | 106 | 46.1 |
| 501-750 | 23 | 10.0 |
| 751-1000 | 19 | 8.3 |
| ≥1000 | 6 | 2.6 |
| Fathers food expenditure per week in(KES) | | |
| <1750 | 155 | 67.4 |
| ≥1750 | 75 | 32.6 |
| Food expenditure per day | | |
| ≤250KES | 203 | 88.3 |
| ≥250KES | 27 | 11.7 |

*Key: 1USD=100 KES

Feeding Practices among Children 6-23 Months in Mwea East Sub-County

Among those who were still breastfeeding more than a quarter (29.6%) was between ages 12-23months while almost a fifth (18.7%) and (18.3%) were between ages of 6-8months and 9-11months respectively. Those who discontinued breastfeeding were a third (33.4%).

The majority of the children (86.1%) had achieved a minimum dietary diversity while (13.9%) did not achieve minimum dietary diversity. Minimum meal frequency was achieved by most of the children aged 6-23 months by (93.5%) while (6.5%) did not achieve a minimum meal frequency. Minimum acceptable diet was met by (85.2%) while (14.8%) did not meet the minimum acceptable diet.

With regard to food consumption patterns, majority (90.9%) consumed foods made from grains, roots and tubers. Other fruits and vegetables were consumed by (43.9%), legumes and nuts (43.5%). Consumption of vitamin A rich fruits and

vegetables was almost a third (32.2%) while consumption of animal origin foods was low, (12.2%) consumed flesh foods while (7.0%) consumed eggs barely (6.1%) consumed dairy products (Table 6).

Table 6: Complementary Feeding Practices

| Feeding practices | N=230 | |
|--|-------|------|
| | n | % |
| Continued breastfeeding | | |
| 6-8 months | 43 | 18.7 |
| 9-11 months | 42 | 18.3 |
| 12-23 months | 68 | 29.6 |
| Discontinued breastfeeding | 77 | 33.4 |
| Complementary feeding practices | | |
| Dietary diversity scores | | |
| Did not meet minimum dietary diversity (less than 3) | 32 | 13.9 |
| Met minimum dietary diversity (4 or more) | 198 | 86.1 |
| Meal frequency | | |
| Met minimum meal frequency | 215 | 93.5 |
| Did not meet minimum meal frequency | 15 | 6.5 |
| Minimum acceptable diet | | |
| Met minimum acceptable diet | 196 | 85.2 |
| Did not meet minimum acceptable diet | 34 | 14.8 |
| Food consumption patterns in the previous 24 hours | | |
| Grains, roots and tubers | 209 | 90.9 |
| Other fruits and vegetables | 101 | 43.9 |
| Legumes and nuts | 100 | 43.5 |
| Vitamin A rich fruits and vegetables | 74 | 32.2 |
| Flesh foods | 28 | 12.2 |
| Eggs | 16 | 7.0 |
| Dairy products | 14 | 6.1 |

Table 7: Food and Alcohol Expenditure Patterns

| Food and alcohol expenditure patterns | N=230 | |
|--|-------|------|
| | N | % |
| Daily food expenditure KES (USD) | | |
| Maternal contribution to household food expenditure per week | | |
| < 1750 | 203 | 88.3 |
| ≥ 1750 | 27 | 11.7 |
| Paternal contribution to household food expenditure per week | | |
| <1750 | 155 | 67.4 |
| ≥ 1750 | 75 | 32.6 |
| Weekly alcohol consumption and expenditure | | |
| Frequency of Weekly maternal alcohol consumption | | |
| One day | 2 | 0.9 |
| Two days | 1 | 0.4 |
| Frequency of Weekly paternal alcohol consumption | | |
| ≤ 2days | 132 | 57.4 |
| 3 - 4 days | 83 | 36.1 |
| 5-6 days | 8 | 3.4 |
| Daily | 7 | 3.0 |
| Paternal weekly expenditure on alcohol (KES) | | |
| ≤ 250 | 76 | 33.0 |
| 251-500 | 106 | 46.1 |
| 501-750 | 23 | 10.0 |
| 751-1000 | 19 | 8.3 |
| >1000 | 6 | 2.6 |
| Time of alcohol consumption | | |
| Evening | 199 | 86.5 |
| Anytime | 2 | 0.9 |
| Morning and evening | 29 | 12.6 |

*Key: 1USD=100 KES

Food and Alcohol Expenditure Patterns

The study found majority of mothers (88.3%) spent <1750KES in a week while 11.7% spent more than 1750 KES in a week. Paternal food expenditure less than 1750KES in a week was slightly more than

two thirds (67.4%) while those who spent greater than 1750KES in a week was almost a third (32.6%) which was slightly higher compared to that of mothers. The weekly alcohol consumption was less in females where only (0.9%) consumed only once in a

week while (0.4%) consumed twice in a week. Majority of fathers who consumed alcohol less than 2 days in a week were more than half (57.4%), whereas those who consumed illicit alcohol for 3 to 4 days were more than third (36.1%), where consumption of 5 to 6 days was 3.4% while the least were daily consumers was only (3%). Paternal weekly expenditure on alcohol was between KES 251 to 500KES with almost half of the fathers (46.1%) while almost a third (33%) spent less than 250KES. A tenth (10%) spent between 501 and 750KES. Nearly a tenth (8.3%) spent between 751KES to 1000KES and the least (2.6%) spent more than a thousand. Majority of fathers (86.5%) took alcohol in the evening, (12.6%) consumed alcohol

both in the morning and evening while a few (0.9%) consumed alcohol any time (Table 7).

Relationship between Alcohol Expenditure and Food Expenditure versus Complementary Feeding

No correlation was found between alcohol expenditure and complementary feeding in terms of dietary diversity ($r = -0.029$; $p=0.663$), meal frequency ($r=-0.065$; $p=0.324$) and minimum acceptable diet ($r=0.254$; $p=0.062$). A correlation was found between food expenditure and complementary feeding in terms of dietary diversity ($r= 0.273$; $p=0.001$) meal frequency ($r=0.290$; $p=0.001$), and minimum acceptable diet ($r=0.891$; $p=0.002$) as shown in Table 8

Table 8: Pearson Correlation between Alcohol Expenditure and food expenditure versus Complementary Feeding

| Alcohol expenditure versus complementary feeding | | |
|--|--------|---------|
| | N=230 | |
| | r | P-value |
| Dietary diversity | -0.029 | 0.663 |
| Meal frequency | -0.065 | 0.324 |
| Minimum acceptable diet | -0.254 | 0.062 |
| Food expenditure versus complementary feeding | | |
| | r | P-value |
| Dietary diversity | 0.273 | 0.001* |
| Meal frequency | 0.290 | 0.001* |
| Minimum acceptable diet | 1.497 | 0.002* |

Key: * Significant at $p<0.05$

DISCUSSION

The findings of this study showed that most children's complementary feeding met the minimum dietary diversity. Findings from this study indicated that nearly all the children 6-23 months of age consumed foods made from grains, roots, and tubers because they were readily available. Kirinyaga County is also considered a food secure area which could have contributed to the attainment of a minimum dietary diversity. The findings of this study are in agreement with the results of a study by [13] conducted in Ghana which found that most of the households attained a minimum dietary diversity by 82% where majority of the children consumed foods from cereals and tubers. The majority of households consumed rice, in the current study and this was related to the fact that it is the major food crop in the area. The study findings on a high consumption of grains, roots and

tubers is comparable to the Kenya national figures as reported in Kenya Demographic Health Survey, [14] and the findings of a study by [15] in Korogocho slum in Nairobi, Kenya. The achievement of a minimum dietary diversity could have also been attributed to maternal role in the acquisition of food for the child. The high consumption of grains, roots and tubers can be related to the fact that being a low income community and rice being the food crop in the area then mothers would go for cheaper foods, usually grains, roots and tubers. However, the consumption of flesh foods, eggs and dairy products was low and thus concurred with the findings of [16,15] conducted in Nairobi, Kenya.

The frequency of feeding is an important indicator for the attainment of adequate dietary intake and therefore health and nutritional status. Frequent meals are required to ensure the child receives enough

energy. [7] The nutrition requirements of children increase during the complementary feeding period. [17] In this study, the majority had attained a minimum meal frequency (93.5%), which were similar to a study conducted in Korogocho, Nairobi. [16] The findings were similar with the findings of [18] in Guntur District which established that 94% of children 6-23 months attained a minimum meal frequency. The findings of [14] indicated that about a half of the children 6-23 months of age received a minimum meal frequency in Central Kenya and also in Kenya. In conclusion, complementary feeding in this study was sufficient in terms of meal frequency. Another Study conducted in Ghana by [19] indicated that most of the children met the minimum meal frequency. It was argued that, as dietary diversity increased, the meal frequency also increased. Similarly, a study by [20] showed similar results.

The minimum acceptable diet was attained by almost all the children 6-23 months of age (children who attained a minimum dietary diversity and minimum meal frequency). The attainment of minimum acceptable diet was contributed to as a result of high dietary diversity and meal frequency. On the contrast, findings from, [21] established that the minimum acceptable diet was generally low at 20%. Other studies by [22,23] established that the minimum acceptable diet was low with 14.3% and 15.7% respectively similarly, a study conducted in Ghana by [24] found similar results on the low attainment of minimum acceptable diet. The study findings were not in agreement with the present study.

CONCLUSIONS

The study findings demonstrated that complementary feeding practices play a key role on the overall nutrition status of children aged 6-23 months. In this study, the complementary feeding practices were met by majority of the children. However Pearson correlation found a significant relationship between alcohol expenditure and minimum acceptable diet. Food

expenditure versus dietary diversity and meal frequency were also significantly associated. Paternal illicit alcohol consumption was associated with complementary feeding practices of children 6-23 months of age. The government and NACADA should strengthen the measures in place to eradicate illicit alcohol.

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Availability of data and Materials

The authors will make the data available upon reasonable request.

Author's contribution

TM: Principal investigator, study design, data collection and article writing. IO, WP and PC assisted in study design and writing WK: Statistical analyses. All authors read and approved the final manuscript.

Competing interests

The authors declare they have no competing interests.

Ethics approval and consent to participate

Before the data collection process, a permit was obtained from Kenyatta University Graduate School. Ethical clearance from Kenyatta University Ethical Review Committee (PKU/513/1606) and research permit from National Council for Science, Technology and Innovation (Permit No: NACOSTI/P/16/38651/12288) in Kenya. Permission to conduct the research was sought from the local administration. Furthermore, an informed verbal and written consent was obtained from each respondent before conducting the interview and also confidentiality was assured to them. The names of the respondents were also not included in the questionnaires. The participants were informed that they could withdraw from the study

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