Fruit Intake and Nutritional Status of Young Children and their Mothers/Caregivers in Rural Western Kenya

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1. Introduction

In Kenya, high prevalence of malnutrition (stunting, wasting, and underweight) and micronutrient deficiencies including vitamin A exist, particularly in rural areas. Increased cultivation and consumption of fruits may help farming households to address malnutrition, but little information is available on the current on-farm fruit tree diversity and consumption.

Objective
To describe fruit cultivation and consumption in relation to the health and nutritional status of pre-school children and their mothers/caregivers in farm households of Western Kenya.

2. Methodology

- Descriptive, cross-sectional two cluster study design.
- Ninety six households randomly selected from different agro-ecological zones from Busia (44 households) and Kakamaga (52 households) Counties of Western Kenya, focusing on 96 children under five and their mothers/caregivers (Figure 1).
- Mothers/caregivers were interviewed on fruit tree species cultivated on their farm, household food security, household dietary diversity (HDD) based on 24-hour recalls and dietary intake based on quantified food frequency questionnaires.
- Anthropometric measurements (weight and length/height) of children were used to calculate Z-scores for growth indicators. A child’s age and measurements, length/height-for-age (HAZ) associated with stunting, and weight-for-age (WAZ) associated with underweight and weight-for-length/height (WHZ) associated with wasting were evaluated.
- In mothers weight and height was used to calculate body mass index (BMI) based on WHO weight-to-height ratio.
- SPSS to perform descriptive statistics, comparison of means (T-test) and correlation analysis.

3. Results and Discussion

Nutritional status of children

- Out of the 96 children sampled, 6% were underweight (below -2SD from the reference median), 23% were stunted (below -2SD) and 2% were wasted (below -2SD). Prevalence of underweight and stunting were lower than the values reported by KDHS (12% and 34% respectively) for Western Kenya. Prevalence of wasting was similar to that reported in KDHS 2009 (2%).
- There was no significant difference in WAZ, HAZ and WHZ between Busia and Kakamaga Counties.

Fruit tree species cultivation

- The mean number of fruit tree species per farm was five (range 0 - 9) according to the respondents.
- The most frequent fruit species found on farms were avocado, banana, guava, loquat, mango, jackfruit, java plum, (jambolan) and passion fruits.

Fruit consumption and dietary diversity:

- Children consumed 70 grams of fruits (median) per day (range 2 - 374 grams/day) during the four weeks preceding the interview. This is only 3% of the recommended amount (150 g/day) for children below 5 years (USDA, 2013).
- Mothers/caretakers consumed 107 gram of fruits (median) per day (range 1 - 518 grams/day).
- This is only 1/3 of the recommended amount (300 g/day) for adults (USDA, 2013).
- Only 45% of the households consumed a fruit the day preceding the interview. Out of these, only 21% consumed at least one vitamin A-rich fruit such as mango.

Correlations between fruit diversity, fruit consumption and nutritional status

- For children, the daily fruit consumption (grams/day) was weakly positively correlated with HAZ (Table 1; Fig. 4). The number of food groups consumed in the whole household the day preceding the interview was also weakly positively correlated with HAZ of these children (Table 1; Fig. 5).
- A higher amount of daily fruit intake (g/day) in children and a higher dietary diversity may lead to a better nutrition status of the child but the relationship was very weak (Table 1).
- For mothers/caretakers, fruit consumption was weakly positively correlated with mother’s BMI (Table 1).
- Number of fruit tree species mentioned by respondents to be grown did not correlate with mean daily fruit intake of mother/caretaker/child (Table 1).

Table 1: Results of correlation analysis between the 96 surveyed children and mother/caregiver’s number of the food groups consumed in the household the day preceding the interview, the daily fruit consumption and health indicators. For all correlations, Pearson correlation coefficients are given

<table>
<thead>
<tr>
<th></th>
<th>Weight-for-Age Z-scores</th>
<th>Height-for-Age Z-scores</th>
<th>Height-for-Height Z-scores</th>
<th>Mothers’ BMI</th>
<th>Number of fruit tree species grown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s mean daily fruit intake (g/d)</td>
<td>0.18</td>
<td>0.211*</td>
<td>0.085</td>
<td>0.256*</td>
<td>0.173</td>
</tr>
<tr>
<td>Mother’s mean daily fruit intake (g/d)</td>
<td>0.046</td>
<td>0.148</td>
<td>-0.058</td>
<td>0.271*</td>
<td>0.109</td>
</tr>
<tr>
<td>Number of food groups consumed (24-hour recall)</td>
<td>0.139</td>
<td>0.217*</td>
<td>-0.005</td>
<td>0.074</td>
<td>0.185</td>
</tr>
</tbody>
</table>

Household food security and food procurement

- 72% of mothers/caregivers did not produce enough food and 97% not enough fruits at their farms to last them until the next harvest season, partly due to lack of agricultural inputs e.g. seeds.
- Mothers/caregivers reported that they often have problems to access fruits (35% of respondents) and vegetables (9%) from their farms and/or local shops.

4. Conclusions

i. The daily fruit intake of mothers/caretakers and children below 5 years are less than the recommended daily fruit intakes.
ii. Fruit intake and nutritional status of children are slightly related.
iii. There is need to create awareness on the importance of fruit consumption and to increase on-farm fruit production in Western Kenya to improve nutrition and health of children and mothers.