HOMESTEAD FOOD PRODUCTION WITH NUTRITION EDUCATION IMPROVES BREASTFEEDING PRACTICES

Nutrition education improved breastfeeding and appropriate complementary feeding practices has the potential to reduce the global burden of child morbidity and mortality. However, limited information exists on the impact of nutrition education intervention(s) on child growth in Cambodia. In 2006 Helen Keller International (HKI) partnered with the Lutheran World Federation (LWF), with the financial support of Dan Church Aid (DCA), to implement the Nutrition Initiative Project (NIP), a comprehensive community-based intervention that integrates household food production with a nutrition education component to address childhood malnutrition. The project, which was implemented in three provinces in Cambodia, had support from HKI, LWF and DCA for 3 years. This bulletin highlights the impact of the NIP on beneficiaries’ breastfeeding practices, food production, and consumption.

Introduction

Malnutrition is a significant problem among children and women in Cambodia. Nationally 38% of the children are underweight, 37% are stunted and 5% are wasted. Underweight and stunting are more prevalent among children whose mothers have no formal education (43% and 46% respectively) compared to those with at least a primary education (36% and 38% respectively). One in every five women (20%) of reproductive age is chronically energy deficient or “thin” (BMI<18.5 kg/m²). Micronutrient deficiencies particularly in vitamin A, iron and iodine are widespread. Anemia affects 62% of children, 47% of women of reproductive age, and 57% of pregnant women. Malnutrition often begins very early in life, and can have lasting consequences on physical and cognitive development, as well as impair immune function, increasing the frequency and severity of sickness. Anemia, even in mild cases, is associated with an increased risk of maternal mortality.

Low dietary intake, sub-optimal feeding practices and high infection burden are likely contributors to malnutrition among children and women in Cambodia. A community-based dietary diversification strategy such as homestead food production, coupled with nutrition education, is considered one of the most sustainable approaches to improve food security and combat micronutrient deficiencies.

Helen Keller International (HKI) has successfully implemented such integrated food-based and nutrition education interventions in Bangladesh, Cambodia, the Philippines and Nepal for more than 2 decades. A review of these programs showed improved dietary diversification including increased consumption of animal foods (in particular liver and eggs) among program households. Anemia prevalence among children was also reduced in all countries. Past studies in other countries have also found that nutrition education, in association with food supplementation programming, has improved nutritional status more than food supplementation programs alone.

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1 Cambodia Demographics Health Survey 2005
In addition, nutrition counseling on breastfeeding, complementary feeding and vitamin A supplementation has a proven impact on nutritional status of children. Research has also demonstrated that nutrition education promoted by village health support groups (VHSG) in Cambodia has a positive impact on child growth3. VHSG are community health workers who are trained by governmental and non-governmental organizations to counsel mothers on healthy feeding practices for young children and promote positive behavior change for improved household health and nutrition.

Recognizing the importance of food based strategies with nutrition education, Dan Church Aid (DCA) funded HKI to partner with the Lutheran World Federation (LWF) to implement the Nutrition Initiative Project (NIP) in six districts of Kampong Speu, Kampong Chhnang and Battambang provinces beginning in August 2006. In the NIP, LWF was responsible for designing and implementing an intervention which included home gardening, poultry-raising and nutrition education among poor households with children under five years of age. HKI served as a resource agency, providing training and technical assistance to LWF staff primarily on the nutrition education component and monitoring and evaluation of the overall project.

**Evaluation Methodology**

HKI staff trained 57 LWF staff to conduct the baseline survey in April 2007 and the end line survey in April 2009 to assess the impact of the project on household food security and the nutritional status of program participants. A pre-coded, structured questionnaire was used to collect data on food production, food consumption and income, along with health, nutrition and socio-economic indicators. The survey involved 1,260 households selected through multi-stage cluster sampling from a total of 6,080 households. Households involved in the survey were selected from 63 of the 304 villages where NIP was implemented. The evaluation involved no control group. Therefore the results presented are data from baseline and end line surveys from only the program communities.

**Results**

**Breastfeeding and childcare practices**

Exclusive breastfeeding from 0 to 6 months and breastfeeding along with complementary foods until a child reaches 2 years of age are optimal child feeding practices.

Exclusive breastfeeding provides infants with all necessary nutrients, strengthens their immune systems, and also prevents sickness that they may get from early introduction of other foods and liquids. Appropriate complementary feeding beginning at 6 months also provides infants with nutrients that breast milk alone can no longer supply in adequate amounts at that age.

Our results demonstrate a 20% increase in the number of mothers exclusively breastfeeding their infants from baseline to end line (Fig 1). Moreover, the number of women feeding their newborns breast milk within one hour of birth increased by 13% over the same period. Early initiation of breastfeeding is important for maternal health, as it facilitates the contraction of the uterus; for the baby, it is important as the first milk contains nutrient-rich colostrums and fosters bonding between mother and child.

**Availability and Accessibility of micronutrient rich foods**

At baseline only 34% were practicing home gardening. In this project, home gardens were categorized into three types as: traditional, improved and developed (Fig 2). **Traditional gardens** consist of seasonal gardens on scattered plots and have limited varieties of vegetables. Most households with a garden tended traditional gardens at baseline (23%). An **improved garden** is defined as a seasonal garden with gourd and non-gourd vegetable varieties on a fixed plot, and a **developed garden** is a garden with many vegetable varieties grown year-round on a fixed plot of land. At end line, the number of households with a home garden increased significantly, to 78% (Fig 2).

Many households, however, had seasonal access to adequate water sources. Through slight improvements, households with gardens gained access to a year-round water source such as a hand pump or a ring well at end line (48%).

A reliable and affordable supply of vegetable seed is a critical component of vegetable cultivation, though little change was seen in seed sources from baseline to end line. At baseline 48% of gardening households relied on NGOs for their seeds; this increased to 52% at end line.

Though the number of households growing vegetables increased significantly, most households cultivated traditional gardens, and thus the number of vegetable varieties cultivated and total output increased nominally from baseline to end line. The median number of vegetable varieties grown by households in the project increased from 3 to 4, while total kilograms of vegetables produced in a one-month period increased from 9.5kg to 10kg during project implementation.

Raising poultry is also commonly practiced in most rural, poor households in Cambodia. At baseline 80% of households had poultry and at the end line survey, this had increased to 86%.

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The Nutrition Initiative Project

HKI began supporting nutrition education in Cambodia in 1998. HKI uses a community-based, peer education approach to reach mothers and children. HKI staff train village health support groups (VHSG) about the importance and appropriate timing of exclusive breastfeeding and introduction of complementary foods, as well as the importance of foods rich in essential vitamins and minerals such as vitamin A, iron and iodine. This empowers VHSG to raise awareness amongst their communities and catalyze positive behavior change. HKI also provides VHSG, health centers and other community groups with leaflets, flip charts, nutrition counseling cards, posters and other information, education and communication (IEC) and behavior change communication (BCC) materials to reach community groups with leaflets, flip charts, nutrition counseling cards, posters and other information, education and communication (IEC) and behavior change communication (BCC) materials on healthy eating, hygienic food preparation practices and supplementation with essential vitamins and minerals, like vitamin A. Often alternative messaging strategies, like community theatre or broadcasting, are utilized.

In the NIP, HKI was the resource agency for LWF, responsible for training LWF staff and supporting LWF staff to train VHSG on nutrition education. HKI also assisted with program design, monitoring and evaluation, and provided a range of IEC and BCC materials to partners and beneficiaries. HKI designed and conducted an eight-day course on nutrition education and a five-day training on database management for 192 LWF staff. HKI also assisted LWF to train 128 VHSGs in a two-day nutrition course and to conduct a one-day nutrition education orientation for 6,080 households in the NIP. HKI also conducted three-day refresher courses on nutrition education for all originally trained LWF staff and supplied thousands of IEC and BCC materials to staff, VHSG, village chiefs and households.

Though the total number of households owning poultry increased very little, the median number of chickens owned per household increased notably, from 16 to 25 birds (all sizes and ages).

Income utilization

Surplus, homegrown vegetables and fruits as well as extra eggs and poultry from homestead food production can be sold in local markets to supplement household income. At baseline 33% of households were earning income from vegetables, fruits and poultry. The median income earned from the sale of homestead food products was 40,000 riel (10 USD) over a three-month period. At end line, 35% of households sold surplus foods, earning a median amount of 70,000 riel (17.5 USD) over a three-month period. Past studies done by HKI in similar projects have shown that up to 90% of households that earn income from the sale of surplus homestead food production products often used such income to purchase additional food for the household. Similar results were found in the NIP evaluation where women overwhelmingly used the income earned to purchase additional food (Fig 3). Seventy-eight percent and 85% of households at baseline and end line, respectively, used the income earned from the sale of surplus produce to purchase fish, beef, pork, rice and MSG (Fig 3). The majority of the remaining surplus income was used to purchase medication and clothing or to finance education and food production activities. For most households involved in the survey, women were the primary decision-makers regarding the use of income earned from household food production at both baseline (86%) and end line (89%).

Food consumption/dietary vitamin A intake

Though a goal of the NIP was to increase vegetable and fruit intake, little change was observed. Total amount of vegetables consumed by households over the three days prior to the survey increased from 2kg at baseline to 2.5kg at endline. Household consumption of fruit over the same recall duration did not change between baseline (2kg) and end line (2kg).

Families’ egg consumption increased slightly, with the median number of days per week that eggs were consumed increasing from 2 at baseline to 4 at the end of the project. Frequency of egg consumption by infants 6 to 23 months was also observed. The proportion of infants 6 to 23 months who consumed eggs at least 2 times per week increased from 30% at baseline to 48% at endline.

Information on household consumption of other essential foods, such as cooking oil, which aids in the absorption of micronutrients, and iodized salt were also obtained. The median amount of cooking oil used by the family in a one week period increased from 50 g to 200 g. More than two thirds of households used iodized salt for cooking at both baseline (75%) and end line (72%).

Fish consumption, an important source of iron and vitamin A remained high. Nearly all households reported eating fish within one week of the baseline (94%) and end line surveys (96%).

**Morbidity**

Severe diarrhea is a major cause of morbidity and mortality among young children. Results from our survey indicate a reduction in diarrhea among children between baseline (35%) and end line (25%).

**Vitamin A supplementation**

Vitamin A capsules (VAC) are a critical source of vitamin A for children and postpartum women in Cambodia. National vitamin A supplementation (VAS) activities are conducted bi-annually in May and November to reach children aged 6-59 months, and health center staff are responsible for ensuring that women receive a VAC (200,000 IU) within 6 weeks of delivery. Various barriers, however, impede supplementation, and coverage falls short of the national goal of 90% coverage for children and 75% coverage for postpartum women. No improvement was seen in VAS coverage amongst children with 90% coverage at baseline and 79% at end line (BL n=1384; EL n=1043). It should be noted that education on the importance of VAS was conducted two months prior to the baseline survey, which likely impacted baseline results. At baseline, 43% (n=536) of postpartum women had received a VAC after their last pregnancy; by end line coverage had increased to 56% (n=700).

**Conclusions**

Though the number of households practicing home gardens more than doubled, cultivation and consumption of vegetables and fruits increased marginally. The median number of days per week that a household consumed eggs increased. NIP also had only a slight impact on income earned from home food production, as a majority of households at end line were not earning income from vegetables, fruits and poultry products (65%). This is expected, given the low output of vegetables and fruits.

The NIP however appears to have positively impacted breastfeeding practices. Early initiation of breastfeeding improved by 13%, while the number of mothers practicing exclusive breastfeeding until their infants reached 6 months of age increased by 20% between baseline and end line.

Complementary feeding also improved slightly, as measured by an increase in the frequency of egg consumption amongst infants 6 to 23 months of age.

The program also seems to have improved vitamin A supplementation for postpartum women. Improvements in these outcomes may be associated with successful nutrition education. Other indicators of nutrition education impact, such as the prevalence of diarrhea in children, suggest successful knowledge transfer.

Cases of diarrhea decreased by 10% from baseline to end line, indicating a potential improvement in knowledge on food hygiene, hand washing and sanitation amongst beneficiaries.

One limitation of the evaluation is that our evaluation did not involve a control group. Therefore most of the results presented here cannot be directly linked to the NIP program. However, we believe the changes seen between the baseline and end line surveys may be partly due to the NIP intervention. The impact of nutrition education on improving consumption of foods rich in micronutrients was not seen, however, perhaps because the project did not significantly increase household access to vegetables, fruits and other food sources rich in micronutrients. It is therefore possible that mothers’ knowledge on nutrition improved, yet due to a lack of availability, mothers could not increase household consumption of micronutrient-rich foods. Even in the absence of increased food access, nutrition education can change behavior relating to infant feeding and care and vitamin A supplementation for postpartum women.