Country Story from Ethiopia

Food as Medicine: How a Hospital Kitchen Is Transforming Cancer Care for Children in Ethiopia

The Global Nutrition Challenge

Cancer is a leading cause of morbidity and mortality among children worldwide(1). Nutritional status is a critical determinant of treatment tolerance, immune function, and survival in pediatric cancer patients, and poor nutritional status has been consistently associated with increased treatment-related complications and reduced overall survival in multiple studies(1-6). In Ethiopia, the annual incidence of childhood cancer is estimated to range from 3,707 to 6,000 cases(7). At the same time, a national review found the 49.2% of children are classified as undernourished. Many pediatric oncology units have limited to no access to commercial therapeutic foods, enteral formulas or parental nutrition, making it exceedingly difficult for clinicians to manage severe nutritional conditions. Moreover, many pediatric oncology units have limited access to trained nutritionists, further illustrating systemic gaps in nutritional support. Such shortages promote poor treatment tolerance, increase complications and delays chemotherapy, emphasizing the urgent need to establish affordable scalable nutritional interventions within cancer centers.

In response to these limitations, health professionals in different cancer centers in Ethiopia used **locally prepared, nutrient-dense foods** to support nutritional rehabilitation for malnourished children. Building on this approach, the International Initiative for Pediatrics and Nutrition (IIPAN), a capacity-building program based at Columbia University Irving Medical Center, has introduced its “Food as Medicine” program in Ethiopia. Through this initiative, partner hospitals establish hospital kitchens, train nutritionists and create practical recipes that use affordable, locally available Ethiopian ingredients such as Beso, oat, dates, flaxseed, honey, peanut butter, and banana to prepare homemade F-100 and protein balls. This approach ensures that children with cancer receive consistent, culturally acceptable, cost-effective nutritional support throughout their treatment journey.

The Innovation

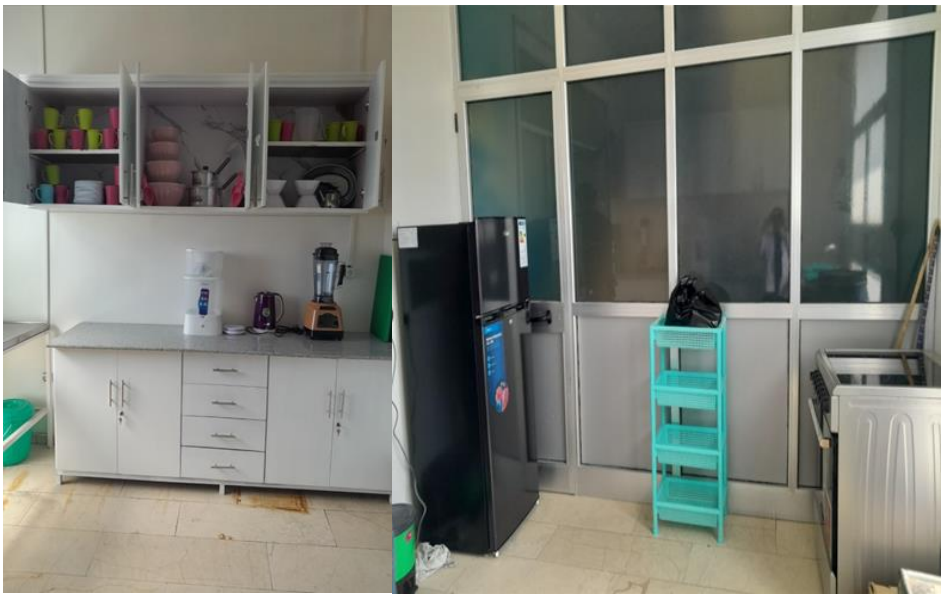
In Ethiopia, four cancer centers collaborate with IIPAN: Tikur Anbessa Specialized Hospital (TASH) and St. Paul’s Hospital in Addis Ababa, the University of Gondar Comprehensive Specialized Hospital and Jimma Medical Center.

Tikur Anbessa specialized hospital (TASH) located in Addis Ababa, is the largest tertiary referral hospital in Ethiopia. The pediatric hematology oncology unit has 26 dedicated inpatient beds and provides an estimated 7,000-10,000 pediatric oncology visits per year. In partnership with IIPAN, Tesfa Addis Parents Childhood Cancer Organization (TAPCCO) and TASH have established a dedicated nutrition program that supports children undergoing cancer treatment.

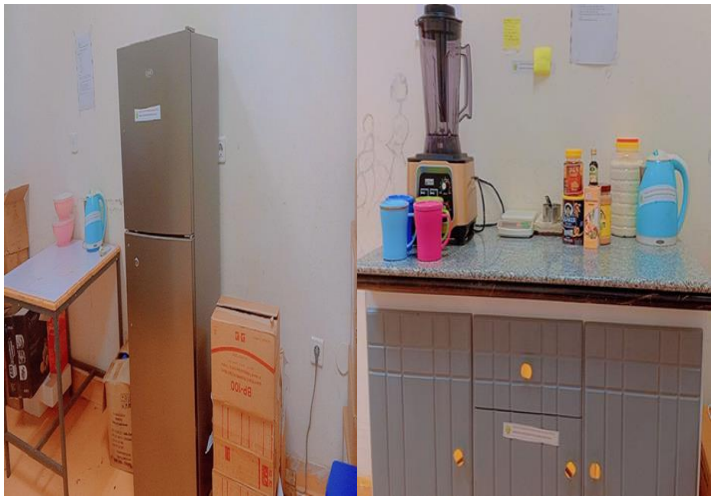
The University of Gondar Comprehensive Specialized Hospital, located in the Amhara region about 750 km northwest of Addis Ababa, is one of the oldest hospitals in Ethiopia—second only to TASH and has a 35-bed inpatient ward dedicated to pediatric oncology. More than 700 children and adolescents have been diagnosed with cancer at this facility. In collaboration with IIPAN, the Gondar Pediatric Cancer Center launched a dedicated nutrition program for children with cancer. Since 2024, this program has been providing ongoing nutritional assessment, care, and support to patients.

At the heart of this initiative are Tsigereda Yitbarek and Tigist Dawit, who developed energy dense, high-protein recipes from local resources to overcome the inconsistent availability of commercial therapeutic foods. By working together, they introduced targeted nutrition interventions to address these gaps and ensure that the best of evidence-based nutrition care is provided to children with cancer.

The Food as Medicine kitchen at TASH and University of Gondar prepares locally produced nutrient- and calorie-dense foods, including a local F-100 therapeutic formula and protein balls, designed to support children who are acutely malnourished or struggling to meet calorie and protein requirements.



Tikur Anbessa Specialized Hospital (TASH)



The University of Gondar Comprehensive and Specialized Hospital

Nutritional recipe for protein balls

<table>
<tr><th colspan="3">Protein balls recipe</th></tr>
<tr><td>Beso</td><td>50g</td><td rowspan="7">Servings:
Makes 10 protein balls (~50 g per protein ball)

Tools needed:
Kitchen weighing scale, large bowl, blender, spoon, and medium size plate

Procedure:
1. Wash hands with soap and clean water for 20 seconds before preparing
food.
2. Ensure the tools and preparation surfaces have been cleaned with soapy clean water.
3. Wash the dates with clean water prior to removing the pits.
4. Remove the internal part (pit) of the dates.
5. Add the dates and some clean water into the blender and blend until a
paste forms.
6. In large bowl, combine the remaining ingredients together.
7. Add the grinded dates to the bowl that contains all ingredients.
8. Mix all the ingredients until you get smooth texture ball.
9. Form smaller balls with your hands (each ball should be approximately
50 g).
10. Once finished, store the protein balls in the refrigerator to set.</td></tr>
<tr><td>Oats</td><td>100g</td></tr>
<tr><td>Flaxseeds</td><td>50g</td></tr>
<tr><td>Dates, pitted</td><td>100g</td></tr>
<tr><td>Peanut butter</td><td>100g</td></tr>
<tr><td>Honey</td><td>50g</td></tr>
<tr><td colspan="2">Nutrient information: Per 50 g serving: 191.8 calories, 5 g protein, 26.4 g carbohydrates, 4.1 g fiber, 7.7 g fat</td></tr>
</table>

Nutritional recipe for F-100

Homemade F-100 recipe	
Peanut butter	100g
Oats	50g
Banana	252g
Vanilla extract	10ml
Water	1000ml
Dates	100g
Beso	50g
Honey	50g
Flaxseeds	50g
Multivitamin syrup	15ml

Servings:
Makes approximately 1.8 liters of formula

Tools needed:
Blender, cups, and utensils

Procedure:
1. Wash hands with soap and clean water for 20 seconds before preparing food.
2. Ensure the blender, utensils, and cups have been cleaned with soapy clean water.
3. Wash the banana with clean water prior to peeling.
4. Peel the bananas, cut into pieces, and put into blender.
5. Wash the dates with clean water prior to removing the pits.
6. Remove the internal part (pit) of the dates.
7. Measure 100g of date and add into blender.
8. Measure 100g of peanut butter and add into blender.
9. Measure 50g of beso powder and add into blender.
10. Measure 50g of honey and add into blender.
11. Measure 50g of flaxseed and add into blender.
12. Measure 50g of oats and add into blender.
13. Add 1L of safe boiled and cooled water into blender.
14. Blend in the blender until a smooth liquid forms.
15. Pause the blender, add 15 mL of multivitamin syrup and 10 mL of vanilla extract.
16. Blend again until you get a fine liquid.

The Impact

Every day, the Food as Medicine program in Ethiopia provides nutritious, therapeutic foods and formulas to more than 100 children receiving cancer treatment. Children with severe and moderate acute malnutrition are now getting the therapeutic foods and formulas they need through the ward kitchen. This approach, already being used in several African countries, offers a simple, affordable, and scalable solution to reduce hospital malnutrition in low-resource settings.

References

1. Mengistu B, Belew AK, Baffa LD, Fentie EA, Agimas MC, Shewarega ES, et al. Prevalence of undernutrition among children and adolescents with cancer living in Sub-Saharan African countries: a systematic review and meta-analysis. Global Pediatric Health. 2024;11:2333794X241298807.

2. Ward ZJ, Yeh JM, Bhakta N, Frazier AL, Girardi F, Atun R. Global childhood cancer survival estimates and priority-setting: a simulation-based analysis. The Lancet Oncology. 2019;20(7):972-83.

3. Makamo N, Schoon S, Ozuah N, Kaspers G, Ladas EJ, Huibers M. Prevalence of undernutrition in children with cancer in low-income and middle-income countries: a systematic review. BMJ Global Health. 2025;10(6).

4. Damasco-Ávila E, Velasco-Hidalgo L, Zapata-Tarrés M, Cárdenas-Cardos R, Rivera-Luna R. Feeding difficulties and eating disorders in pediatric patients with cancer. Boletín médico del Hospital Infantil de México. 2019;76(3):113-9.

5. Nyeko R, Van Heerden J, Kambugu JB, Geriga F, Angom R, de Rojas T, et al. Wasting and short-term outcomes among children with cancer in resource-limited settings: A prospective study in Uganda. Plos one. 2025;20(8):e0330107.

6. Chirande L, Kazimoto T, Kaaya E. Late presentation, advanced disease and severe acute malnutrition are common among children with cancer in Tanzania. Tanzania Medical Journal. 2021;32(2):93-103.

7. Kassa E, Ayalew M, Birhan M, Gelaw A, Gidey AM, Zeleke TA, et al. Clinical profile and treatment outcomes of acute lymphoblastic leukemia among children attending at the University of Gondar comprehensive specialized hospital and Tikur Anbessa Specialized Hospital in Ethiopia. PLoS One. 2025;20(6):e0322747.