

Evaluation and improvement of the nutrition in the Shangrila Orphanage Home, Nepal

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Background

Poor diet diversity is one of the major reasons for malnutrition in Nepal. Consequences of malnutrition in childhood are reduced physical and mental performance.

The Shangrila Orphanage Home (SOH) is located in the Kathmandu valley. It is operated by the Nepalese Shangrila association in cooperation with the German association Govinda Entwicklungshilfe e.V.

Aim of the research project was to evaluate the current food supply in the SOH with focus on its nutrient content and to improve the diet in the orphanage.

Day	Morning Snack	Breakfast	School Tiffin	Home Tiffin	Dinner
Sunday	Milk + Biscuits*	Rice + Bean Soup	Rice Flakes + Dalmut*	Puffed Rice+ Dalmut* + Juice + Egg	Dal Bhat + Vegetable
Monday	Milk + Rice Flakes	Rice + Soya Balls + Potatoes + pickles	Bread + Jam	Rice Flakes + Curd	Rice + Bean Soup
Tuesday	Milk + Biscuits*	Dal Bhat + Vegetable	Biscuits*	Rice Flakes + Potato Soup	Dal Bhat + Vegetable
Wednesday	Milk + Rice Flakes	Rice + Soya Balls + Potatoes + pickles	Puffed Rice + Dalmut*	Chow mein	Dal Bhat + Vegetable
Thursday	Milk + Biscuits*	Rice + Bean Soup	Biscuits*	Donought* + Tea	Dal Bhat + Vegetable
Friday	Milk + Rice Flakes	Dal Bhat + Vegetable	Noodles* + Rice Flakes + Dalmut*	Rice Flakes + Bean Soup + Fruit	Dal Bhat + Vegetable
Saturday	Milk tea + Chocolate Biscuits	Rice + Bean Soup +Milk	-	Polenta / Noodle Soup *	Dal Bhat + Vegetable

Chow mein = fried noodles with vegetable, Dal Bhat = lentil soup with rice, Dalmut = crisp and nuts
* food items which were replaced

Original SOH food plan

The table shows the food plan before the amendments were introduced. Food supply in the orphanage has followed a weekly routine. Thus on particular week days equal food was supplied only fruit and vegetable supply varied. Food items classified as less valuable were replaced within the modification period.

Results and conclusion

The analysis proved deficits in many micronutrients. Due to the improved food plan the intake of most micronutrients could be at least slightly raised. A strong improvement was achieved for vitamin A and B12. However, most of the investigated micronutrients are still deficit. The consumption of egg, vegetable, soya products, milk, and dairy products must be raised to reach the recommendations for vitamin B12, folic acid, calcium, iron and zinc. Because vitamin D self-synthesis rates and salt iodine content were unknown the study could not make out the actual vitamin D and iodine supply.

Discussion

The nutrient analysis was based on the estimated food intake and therefore the degree of uncertainty is high. To check the nutrient status of the individual children biochemical analysis like urinary iodine and hemoglobin test should be carried out. To further increase diet diversity predominant eating habits must be changed. Therefore it is most important to increase staff member's awareness for the importance of micronutrient intake to avoid malnutrition.

Methods

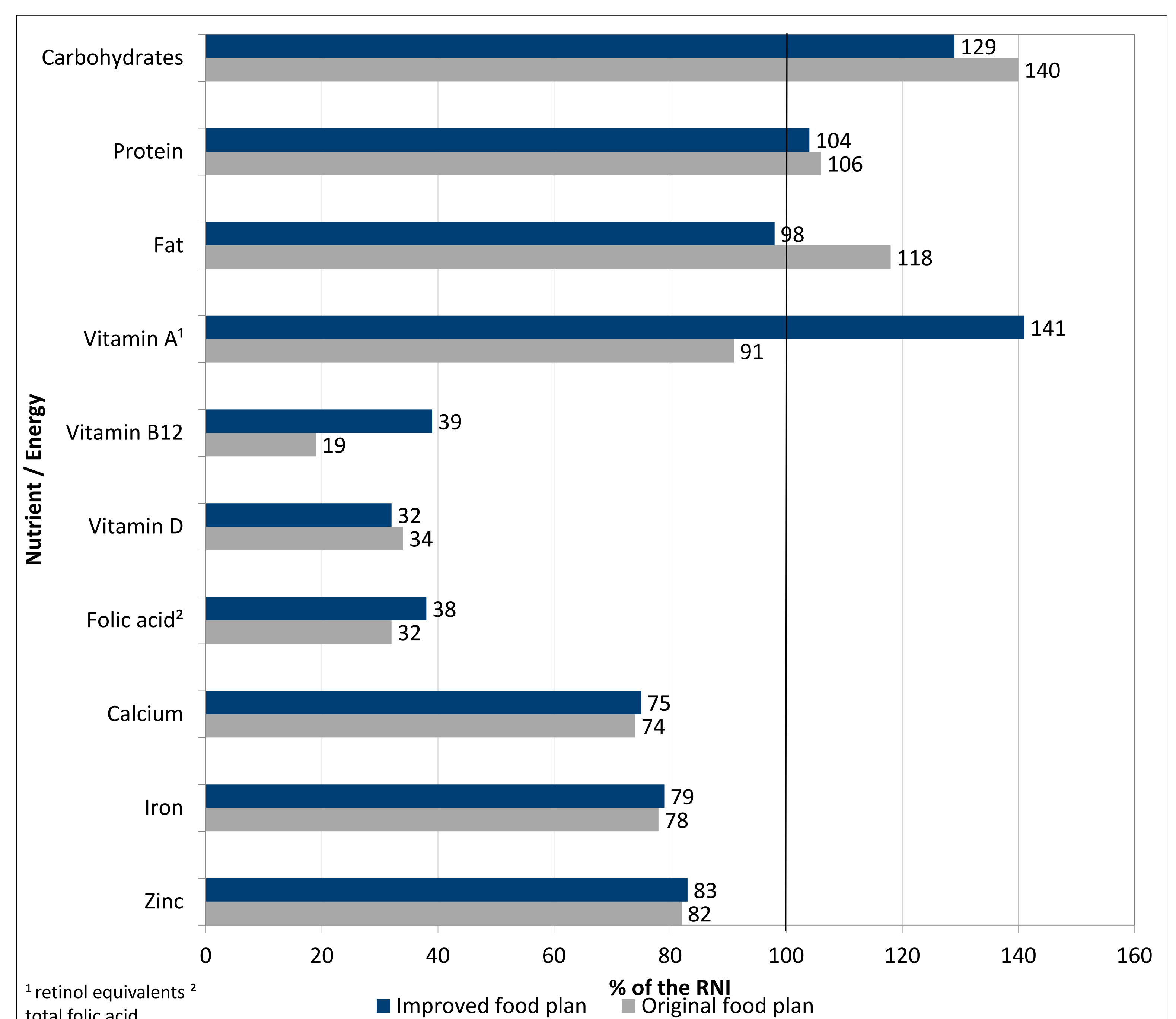
The study was designed as a non-experimental, descriptive action research. The study population consisted of 45 orphans. A nutrient analysis of the weekly food plan was carried out using the software NutriSurvey 2007. Average daily nutrient intake was calculated for ten nutrients and compared with the recommended nutrient intake (RNI) values by WHO/FAO. Together with the SOH team methods to improve diet diversity were developed. The implementation was monitored, supervised, and followed up by a second nutrient analysis.

Day	Morning Snack	Breakfast	School Tiffin	Home Tiffin	Dinner
Sunday	Milk + Rice Flakes	Rice + Bean Soup	Rice Flakes + Peanuts*	Puffed Rice+ Juice + Egg	Dal Bhat + Vegetable
Monday	Milk + Porridge* + Banana*	Rice + Soya Balls + Potatoes + Pickles	Bread + Jam	Rice Pudding*	Rice + Bean Soup
Tuesday	Milk + Rice Flakes	Dal Bhat + Vegetable	Egg* + Vegetable* + Rice Flakes	Rice Flakes + Potato Soup	Dal Bhat + Vegetable
Wednesday	Milk + Porridge* + Banana*	Rice + Soya Balls + Potatoes + Pickles	Puffed Rice + Chickpeas*	Chow mein	Dal Bhat + Vegetable
Thursday	Milk + Rice Flakes	Rice + Bean Soup	Rice Flakes + fried Potatoes*	Rice Flakes + Curd	Dal Bhat + Vegetable
Friday	Milk + Porridge* + Banana*	Dal Bhat + Vegetable	Rice Flakes + smashed Potatoes*	Rice Flakes + Bean Soup + Fruit	Dal Bhat + Vegetable
Saturday	Milk tea + Chocolate Biscuits	Rice + Bean Soup +Milk	-	Polenta	Dal Bhat + Vegetable

* food items which were newly introduced to replace others

Improved SOH food plan

The table shows the improved weekly food plan of the SOH in Nepal. Some new food items were introduced as substitutes for less valuable foods.



Comparison of the percentages of the RNI reached with the original and the improved food plan

The graph shows the changes in the nutrient intake due to the modifications of the orphanage's food plan. Vitamin D self-synthesis were not considered. For beta-carotene a retinol equivalent conversion factor of 6:1 was applied.