

# 1. Introduction

Over the past ten years, there have been advances in the treatment of severe acute malnutrition (SAM) with a scale-up in many countries (1). A major contribution is the introduction of community-based treatment of SAM, where children without complications can be treated in their homes (2). This has resulted in many more children accessing treatment with less inconveniences to the family.

However, children with complicated SAM require in-patient management during which therapeutic feeds are initiated and management of the presenting complications is done. The ultimate goal of nutritional rehabilitation should be optimal nutritional status. Despite advances in management of SAM, correction of all nutritional deficiencies during treatment remains a question. A lot of emphasis is put on adequate energy and protein intake as well as micronutrients particularly vitamin A, multivitamins, folic acid, zinc, copper, magnesium, and iron. Little emphasis is put on polyunsaturated fatty acid (PUFA) intake during recovery from SAM. Furthermore, recovery is based on resolution of medical complications and oedema, weight gain up to 20% of the admission weight or increase in mid-upper arm circumference (MUAC). Little is known whether there is recovery of long chain (LC)PUFA proportions during this period. Treatment could be improved by better understanding of certain aspects such as PUFA composition and their recovery during treatment of children with SAM.

Children admitted with severe acute malnutrition have been reported to have subjective reduction in physical activity (3). Usually recovery from SAM is assessed by regain of body weight with no objective and quantitative assessment of regain of physical activity. Physical activity has been found to correlate with lean body mass (4) and its level may be useful in evaluating treatment and monitoring of patients with SAM in order to ascertain adequate recovery.

The aim of this PhD thesis is to evaluate fatty acid status and physical activity in children admitted with severe acute malnutrition. The specific objectives are:

- to describe whole-blood PUFA composition and identify its correlates in children admitted with SAM
- to discuss change and predictors of change in PUFA composition during treatment
- to assess physical activity and its predictors in children recovering from SAM.