



**Title:** A study to assess the impact of Indigenously produced RUTF supplementation on the antioxidant and oxidative stress biomarker levels in Severe Acute Malnourished Children.

**Name:** Lavina Fernandes, Dr. Alka Jadhav, Dr. Bina Dias, Dr. Prachi Karnik, Divya Ananthasubramanian.

**University/Organization:** Nutrition Rehabilitation, Research and Training Centre (NRRTC), Dept. of Pediatrics, Lokmanya Tilak Municipal General Hospital, Mumbai, Maharashtra, India.

## Abstract

**Background:** Malnutrition was a major public health challenge before the pandemic. COVID-19 pandemic has further exacerbated the problem of malnutrition due to disruption in food supply and nutritional programs services by the government- mandated shutdowns, loss of incomes and rise in food prices. Dietary deficiency of protein in Severely Acute Malnourished (SAM) children results in impairment in the synthesis of plasma albumin, antioxidant enzymes and reduces concentration of antioxidants in the tissue, thereby resulting in a compromised antioxidant status. Furthermore, severe dietary deficiency leads to increased oxidative stress in acute malnutrition. This leads to compromised immune system putting them at a greater risk of contracting infections like COVID-19. Antioxidants protect the body from damage caused by oxidative stress. Ready-to-use Therapeutic Food (RUTF) is considered a gold standard in management of SAM and contains antioxidants.

**Aim:** To compare the changes in antioxidant and oxidative stress biomarker levels in SAM children receiving Indigenous produced RUTF i.e. MNT and Standard Nutrition Therapy (SNT).

**Methods:** This open randomized controlled trial enrolled 60 children between 6-60 months, diagnosed as SAM by WHO criteria. Subjects were divided into two groups that received MNT or SNT for 8 weeks. Outcome measures were mean changes in the levels of Vitamin C, Glutathione (GSH), Malondialdehyde (MDA) and Zinc.

**Result:** Biochemical assays were done in 30 SAM children. The mean (SD) vitamin C levels improved to 0.62 mg/dl ( $\pm 0.23$ ) in MNT in comparison with 0.37 mg/dl ( $\pm 0.09$ ) in SNT; the differences in the mean increment was statistically significant ( $P = 0.0000$ ). The mean (SD) GSH levels improved to 22.8  $\mu\text{mol/L}$  ( $\pm 7.8$ ) in MNT group as compared to 15.21  $\mu\text{mol/L}$  ( $\pm 8.05$ ) in SNT; the differences in the mean increment was statistically significant ( $P = 0.0001$ ). The mean (SD) reduction in the MDA values was -6.38  $\mu\text{mol/L}$  (2.54) in the MNT group and was -4.62  $\mu\text{mol/L}$  (3.40) in the SNT group; the differences in the mean reduction was statistically significant ( $P = 0.02$ ). The mean (SD) Zinc Levels increased to 83.9 mg/dl ( $\pm 30.6$ ) in MNT in comparison with 26.1 mg/dl ( $\pm 13.9$ ) in SNT group; the differences in the mean increment was statistically significant ( $P = 0.0000$ ).

**Conclusion:** The difference observed in the antioxidants level between post and pre measurement was significantly higher in MNT compared to SNT. MNT was found to be more efficacious in improving the antioxidant levels and reducing the oxidant level in SAM children. MNT can be used in emergencies like pandemics to tackle issues like food insecurity as well as to improve their nutritional status/immune system by enhancing their antioxidants levels and reducing oxidative stress.

**Biography:** Ms. Lavina Fernandes is working as Dietitian and RUTF Production Incharge at Nutrition Rehabilitation, Research and Training Centre (NRRTC), Dept. of Pediatrics, Lokmanya Tilak Municipal General Hospital, Mumbai, Maharashtra, India. She has been working in the field of malnutrition and Infant and Young Child Nutrition for the past 9 years at NRRTC. NRRTC is the Nodal centre in Management of Malnutrition located in the midst of one of the Asia's largest slum Dharavi, Mumbai, India. Lavina has won several prizes for her research on malnutrition.