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Titolo tesi: Evaluation of two integrated community-based programs for child malnutrition treatment and prevention in zambia and malawi: effectiveness and sustainable proposes for enanching the models

ABSTRACT

BACKGROUND. Child malnutrition is a public health priority in low-middle income countries. It is strongly associated with an increased risk of poor cognitive and physical development, morbidity, and mortality, especially in most severe cases of malnutrition. The community-based management of acute malnutrition (CMAM), initiated on the back of emergency, and progressively spread through non- emergency areas with high burden of malnutrition, has been advocated as an effective approach to address acute malnutrition for children under five years of age. While research has given considerable attention to curative measures, there is poor evidence on prevention practices within CMAM. Evaluating the effectiveness of integrated community-based models providing multi-sector activities for child malnutrition treatment and prevention is therefore essentially needed.

OBJECTIVE. The objective of this doctoral program was to assess nutritional programs' effectiveness as integrated models of surveillance, treatment and prevention of child malnutrition in non- emergency contexts. It proposed a more holistic approach of child care, which is adapted to specific local contexts, specifically by: 1) describing, assessing and evaluating community-based nutrition programs already existing in the field, in order to identify their strength and main areas for improvement; 2) identifying specific core indicators for child nutrition and health, and proposing activities to be routinely implemented into the programs; 3) evaluating the programs' performance after sustainable implementations were made in critical areas.

METHODS. Two already well-implemented field models of child malnutrition treatment and prevention, form the basis for this doctoral research: Rainbow Project in Zambia that operates through Supplementary Feeding Programs - SFPs, combining nutrition-specific and nutrition-sensitive activities, and DREAM Program in Malawi that provides a holistic approach to HIV/AIDS and malnutrition, combining growth monitoring and nutritional evaluation in the contest of HIV prevention of mother-to-child transmission. Program performance and activities were evaluated and results were discussed.

RESULTS. Chapter 2 analyzed Rainbow SFPs' outcomes over the years 2012-14. These programs demonstrated their effectiveness, with however some area needing improvement: the overall case-fatality exceeded the Sphere Standards with HIV infection, severe wasting and very low weight for age being the main predictors of mortality (respectively HR: 3.1; HR: 3.8; and HR: 3.1). Implementations were therefore proposed accordingly: reinforcing the community volunteers' knowledge on HIV counseling and testing; providing a higher-quality food schedule for children. Chapters 3.1 and 3.2 reported two studies on DREAM Program. The first study conducted on 76 HIV-exposed children, showed children experiencing a significant growth delay during the first years of life, with all forms of malnutrition decreasing the odds of attaining motor milestones, particularly of not walking alone at 18 months of age (stunting OR: 6.1; wasting OR: 8.6; underweight OR: 5.5). In the second study, 1586 HIV-exposed children to whom breastfeeding was promoted up to 12 months of age were monitored for growth, malnutrition and health problems. Breastfeeding was a robust protective factor associated with improved growth and health, but the study revealed the well known vicious cycle between malnutrition and infection, with malaria standing out as a significant deterrent to adequate nutritional

development, highly associated with severe acute malnutrition at 18 months of age (weight-for-length Z-score WLZ <-3 HR: 5.7). Chapter 3.3 described feeding practices and dietary consumption of 37 Zambian malnourished children assisted in Rainbow SPFs before and after nutritional counseling was performed. Children's diet was at first monotonous and inadequate, with significant improvements reported after nutritional counseling: meals/day rose from 3 to 5; children having ≤ 3 meals/day declining from 79% to <3%; animal-sources food consumption increased by 35% ($p=0.004$), vegetables by 35%, and fruit by 50% ($p<0.001$). Higher dietary diversity scores were associated with greater gain in Mid-Upper Arm Circumference-for-age Z-scores. Chapter 4 reported Rainbow SFPs' outcomes over the years 2015-17, after sustainable implementations in critical areas were made: the two most incisive goals reached were the decrease of mortality rate by half (from 5.6% to 3.1%) and the 30% greater access to HIV diagnosis during the nutritional rehabilitation. HIV infection, kwashiorkor, severe underweight status, and poor response to nutritional rehabilitation still posed a great risk of death.

CONCLUSION. This doctoral research demonstrated that DREAM Program and Rainbow Project are effective integrated models for community-based treatment and prevention of child malnutrition in Malawi and in Zambia. Routine monitoring and evaluation have enhanced the programs' performance, by identifying points of strength and critical areas with adjustments implemented accordingly. Within nutritional programs, nutritional rehabilitation must not be considered a stand-alone intervention: IYCF knowledge and counseling, HIV/AIDS prevention, testing and diagnosis, immunization sensitization and awareness, infections control, TB screening, diseases prevention, motor development assessment, must be integrated into protocols since these are critical primary care elements. By providing multi-sectoral activities, integrated models such as the Rainbow Project and the DREAM Program ensure the implementation of a holistic approach to child malnutrition management in food insecure areas with high burden of malnutrition and HIV infection, therefore acting as major public health programs for child growth surveillance, nutrition promotion, health monitoring and care in non-emergency contexts.

Keywords: child malnutrition, community-based management of acute malnutrition, integrated model of treatment and prevention, Malawi, sustainable implementations, Zambia