

OP-12 **EFFECT OF GROWTH MONITORING AND NUTRITION EDUCATION THROUGH FEMALE HEALTH WORKERS IN SEVERE ACUTE MALNOURISHED (SAM) UNDER-FIVES**

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10.1136/bmjgh-2016-EPHPabstracts.12

Background In India, undernutrition amongst children results in a yearly burden of 24.6 million DALYs, 8.1 million children suffering from severe acute malnutrition (SAM) and 600,000 deaths. Growth monitoring of preschool children and nutrition education of their mothers is an essential component of India's Integrated Child Development Scheme (ICDS), but impact on prevalence of undernutrition is far from optimal. We formulate and test the hypothesis that more focused nutrition education, counselling on child feeding and growth monitoring by trained female health workers in addition to ICDS workers positively affect the child's length and weight. Our intervention study focuses on SAM in under-fives, as they present the highest risk of mortality.

Methods Following ethical clearance by the Dutta Meghe University of Health Sciences (Nagpur), we conducted a community-based intervention study in rural areas of Yavatmal district. Our intervention included quarterly growth monitoring, nutrition education, health check-up and treatment of minor ailments of SAM children for one year through female health workers in addition to ICDS workers. This intervention was additional to institutional therapeutic care, provided as per Government of Maharashtra guidelines, which was offered to all SAM children irrespective of their participation in our study.

In Yavatmal district, all 178,563 under-fives enrolled in rural ICDS centres were weighed and height or length taken by ICDS workers. After verification by female health workers, 784 (0.41%) under-fives with SAM were identified. Out of these, 737 were selected for intervention after taking verbal consent. Exclusion criteria were chronic ailments, non-availability in the village for follow-up due to migration, and refusal to participate. Outcome indicators were height and weight gain over the one-year intervention period. Retrospective measurements of height and weight gain one year prior to the intervention from the same group were recorded, so that the same group served as control for comparison.

Prior to the study all medical officers and health supervisors were sensitized in district-level workshops. All female health workers were trained in taking height or length and weight in block-level trainings. Health workers were trained in growth monitoring and nutrition education. District-wide Infant and Young Child Feeding trainings were conducted for all health staff. Female health workers were provided with the state guidelines on Infant and Young Child Feeding. All possible efforts were taken to guarantee follow-up: if a female health worker

was not able to meet the child on the scheduled date, she had to visit the family within the next week. Availability of children was ensured through ICDS workers. Visits of the female health workers were monitored at primary health centre level by the medical officers, which in turn were monitored by the investigators at district level. Every medical officer received a reminder (SMS and telephone call) seven days prior to a scheduled visit.

Appropriate statistical analysis was conducted.

Findings The selected under-fives with SAM were followed up every trimester, resulting in 2,948 scheduled follow-up growth-monitoring visits by a female health worker apart from the monthly growth monitoring by ICDS workers. Of the scheduled quarterly visits, 2,142 (72.6%) were completed on the scheduled date, whereas 806 (27.3%) were not completed on time. Reminders and additional visits were required to complete the expected number. No mortality was observed within the one-year period, neither in the case nor the comparison group.

While average height gain per month from a year prior to baseline was 0.43 cm; that from baseline to a year after was 0.64 cm. Average weight gain per kg body weight a year prior to baseline was 0.09 kg; from baseline to a year after was 0.42 kg. Higher gain in height was observed in younger age groups i.e. below 36 months in both periods. Concomitantly, weight gain decreased in both the periods with increasing age, resulting lowest in the age group above 48 months. Main weight gain was highest in the second trimester of the one-year intervention (0.16 kg), followed by the first trimester (0.13 kg), the third trimester (0.08 kg) and the fourth trimester (0.03 kg). All differences and trends described were statistical significant. When comparing Z-scores before and after the intervention, positive change was confirmed in all though the height-for-age Z-score scored low.

Apart from the observed direct benefit of the intervention, we anticipated increased motivation of the female health workers regarding undernourished children. This was however not the case. When, during the study, new cases of under-fives with SAM were reported in the monthly ICDS monitoring and the health workers were asked to provide follow-up, the response was largely unsatisfactory. When, in the post-study period and after one year, the health workers were asked to routinely follow up old and new SAM cases, the response was very unsatisfactory.

Discussion Average height and weight gain in the intervention period was significantly higher than in the retrospective non-intervention period. Higher gains in the younger age group suggest that early intervention is required to achieve maximum height and weight gain.

Highest weight gain was observed during first and second trimester of the intervention. This may be considered as a rapid catch-up phenomenon, partly attributable to non-study interventions. Indeed, it is mainly in the first 6 months after identification that all under-fives with SAM receive therapeutic services and food supplements at three levels as per state guidelines, independent from our intervention: the Village Child Development Centres at community level, the Child Development Centres at PHC level, and the Nutrition Rehabilitation Centres at hospital level. Notwithstanding, our study intervention's overall results and earlier evidence points towards effectiveness of community-based nutrition education and growth monitoring. This is sufficient reason to specifically include nutrition education of parents and growth monitoring of under-fives with SAM in the daily activities of the health workers, at least until ICDS services are fully oriented to focus more on nutritional education and growth monitoring.

While it was expected that training and involvement in the study would motivate female health workers and other peripheral health staff to continue their efforts beyond the intervention, be it for the identified under-fives with SAM after the study was concluded or for newly identified cases, this has not happened. Sustainability of interventions through peripheral health workers thus seems limited unless rigorously monitored. Institutionalisation of study interventions for severe acute malnourished children needs further research.

No competing interest.