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Home- and community-based growth monitoring to reduce early life growth faltering: an open-label, cluster-randomized controlled trial

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ABSTRACT

Background: Despite the continued high prevalence of faltering growth, height monitoring remains limited in many low- and middle-income countries.

Objective: The objective of this study was to test whether providing parents with information on their child's height can improve children's height and developmental outcomes.

Design: Villages in Chipata District, Zambia (*n* = 127), were randomly assigned with equal probability to 1 of 3 groups: home-based growth monitoring (HBGM), community-based growth monitoring including nutritional supplementation for children with stunted growth (CBGM+NS), and control. Primary study outcomes were individual height-for-age *z* score (HAZ) and overall child development assessed with the International Fetal and Newborn Growth Consortium for the 21st Century Neurodevelopment Assessment tool. Secondary outcomes were weight-for-age *z* score (WAZ), protein consumption, breastfeeding, and general dietary diversity.

Results: We enrolled a total of 547 children with a median age of 13 mo at baseline. Estimated mean difference (Δ) in HAZ was 0.127 (95% CI: −0.107, 0.361) for HBGM and −0.152 (95% CI: −0.361, 0.036) for CBGM-NS. HBGM had no impact on child development [Δ: −0.017 (95% CI: −0.133, 0.098)]; CBGM+NS reduced overall child development scores by −0.118 SD (95% CI: −0.230, −0.006 SD). Both interventions had larger positive effects among children with stunted growth at baseline, with estimated interaction effects of 0.503 (95% CI: 0.160, 0.846) and 0.582 (95% CI: 0.134, 1.030) for CBGM+ NS and HBGM, respectively. HBGM increased mean WAZ [Δ = 0.143 (95% CI: 0.037, 0.328)]. Both interventions improved parental reports of children's protein intake.

Conclusions: The results from this trial suggest that growth monitoring has a limited effect on children's height and development, despite improvements in self-reported feeding practices. HBGM had modest positive effects on children with stunted growth. Given its relatively low cost, this intervention may be a cost-effective tool for increasing parental efforts toward reducing children's physical growth deficits. This trial was registered at clinicaltrials.gov as NCT02262539. *Am J Clin Nutr* doi: https://doi.org/10.3945/ajcn.117.157545.

Keywords: growth faltering, stunting, growth monitoring, height, weight, malnutrition

INTRODUCTION

Research estimates that globally, 167 million children (25.6%) aged <5 y have stunted growth, with prevalence rates >40% in several sub-Saharan African and South Asian countries (1, 2). While linear growth and stunted growth are widely used at the regional or national level as indicators for the nutritional status of children aged <5 y, height information is rarely provided to parents and caregivers in many low-income countries where routine health checkups for children <5 y old primarily focus on weight assessments to track children's physical growth (3).

Given that weight-for-age *z* score (WAZ) is a function of both height and body mass, identifying faltering growth is difficult based on weight records alone. Although parents can compare their children with other children of the same age, such comparisons are not likely to provide reliable information in communities where developmental delays are common. As a result, a large number of caregivers of children with stunted growth are likely to be relatively unaware of physical growth delays experienced by their children unless they are extreme (4), which makes caregiver-initiated efforts to prevent or remediate faltering growth rather unlikely.

At the global level, interest has been increasing in designing and evaluating programs and interventions that aim to increase parental efforts to support child health and nutrition (5). A growing number of national governments have tried to change parental behavior through financial incentives (6–8) and by educating parents on best practices for raising their children, including practices related to feeding and nutrition (5, 9). In

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Supplemental Figure 1 and Supplemental Tables 1–3 are available from the "Online Supporting Material" link in the online posting of the article and from the same link in the online table of contents at http://ajcn.nutrition.org.

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Abbreviations used: CBGM+NS, community-based growth monitoring including nutritional supplementation; DEFF, design effect; HAZ, height-for-age *z* score; HBGM, home-based growth monitoring; MUAC, midupper arm circumference; WAZ, weight-for-age *z* score.

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