Mechanistic effects of a Family Strengthening Intervention on child outcomes in Rwanda.

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Background

Effectiveness studies seek to determine whether an intervention was successful in achieving it's goal of improving key outcomes. Yet, they do not necessarily tell us how this goal was achieved. Practitioners, researchers, and funders are becoming increasingly interested in understanding the *mechanism of change* through which interventions work. In this study we explore the mechanisms of change through which a home-visiting parenting intervention, *Sugira Muryango* ("Strengthen the Family"), achieved its positive effects on children's developmental outcomes in rural Rwanda.

Study Context

Data is drawn from a cluster-randomized trial testing the effectiveness of the Sugira Muryango parenting intervention. The trial enrolled 1,049 families and 1,084 children aged 6-36 months. All families were living in severe poverty as defined by Rwanda's social protection Vision 2020 Umurenge Program (VUP). Measures were drawn from pilot work in Rwanda (Barnhart et al., 2020; Betancourt et al., 2018) and were translated and adapted following mixed methods approaches including cognitive testing and a rigorous translation protocol involving forward and back translation from English to Kinyarwanda (Betancourt et al 2017).

Methodology

Child development was measured using the Ages and Stages Questionnaire (ASQ-3), a parent-reported measure of developmental milestones. We used total raw scores for the different subdomains as continuous outcome scores. **Playful and educational caregiving activities** were measured using the family care indicators from UNICEF's MICS which assess six activities such as singing, reading, and counting that the mother, father or another caregiver engaged in with the child during the prior 3 days. **Caregiver depression** was measured using the 15 depression items from the Hopkins Symptoms Checklist (HSCL-25). **Violent discipline** was measured using eight items from UNICEF's MICS Child Disciplinary modules, as reported by the primary caregivers. Exposure to violent disciplinary practices included being shouted or screamed at, called demeaning names, shaken, spanked, slapped, or beaten.

Analysis

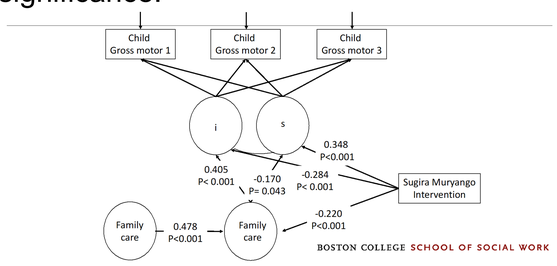
Main trial outcomes across children's developmental domains related to fine motor, gross motor, communication, problem solving and personal social development were examined using growth models and effects are reported in effect sizes below.

Mechanisms of change were examined using structural equation modeling. Changes in child outcomes were modelled as a latent growth model where the intercept (i) and slope (s) was predicted by treatment status and changed in the proposed mechanism (Family care / Caregiver depression / Violent discipline) from baseline to immediately postintervention. Models were evaluated based on model fit statistics and the significance of the path of change in the mediator predicting the slope of change in child development. Here we show only models where change in the proposed mechanism significantly predicted the slope of change in the child development outcomes in the latent growth model.

Results

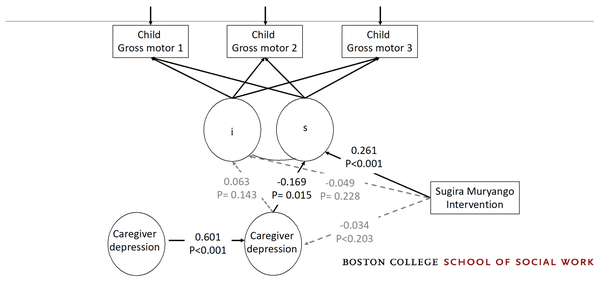
We include 541 intervention families and 508 control families in the analyses. Children in families receiving Sugira Muryango improved more than control families on outcomes related to gross motor (d=0.162, 95%CI: 0.065–0.260), communication (d=0.081, 95% CI: 0.005–0.156), problem solving (d=0.101, 95% CI: 0.002–0.179), and personal-social development (d=0.096, 95% CI: -0.015–0.177) on ASQ-3. We did not see any differences in change on fine motor outcomes and dropped fine motor from further analyses.

Latent growth models showed that changes in **playful and education activities** explained change in gross motor (β = 0.405, p<0.001) controlling for the effects of the intervention. No the other domains reached significance.

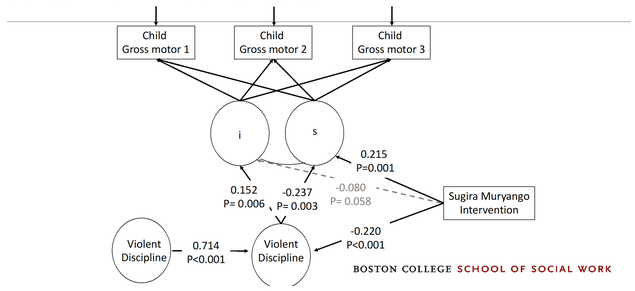


The data fit the model well: RMSEA = 0.046; CFI = 0.945; WRMR = 1,453.

Latent growth models showed that changes in **caregiver depression** explained some of the change in children's problem solving such that higher rates of depressive symptoms were associated with a more negative slope (β= -0.067, p=0.010). The model showed acceptable fit: RMSEA = 0.59; CFI = 0.859; SRMR = 0.046.



Latent growth models suggested that higher levels of **violent discipline** were associated with less growth in gross motor outcomes (β= -0.237, p=0.003).



Discussion & Implications

Understanding mechanisms by which early parenting interventions improve child development is important for the design, optimization, and scale up of programs to reach vulnerable families. Findings from this study suggest that the Sugira Muryango intervention activated different pathways of change in caregiver's behaviors and mental wellbeing which, in turn, explained some of the positive influences on child development outcomes across domains of gross motor and problem solving.

Acknowledgement

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