Is women's empowerment a pathway to improving child health outcomes?: Evidence from a randomized control trial in Burkina Faso

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Abstract

Many health promotion activities empower women as a pathway to improving child health. Using data from a cluster-randomized control trial in Burkina Faso, we examine relationships between child nutritional status and women's empowerment and whether increased women's empowerment is associated with improved child nutritional status. We first examine which women's empowerment domains predict nutritional status at baseline when children are 3-12 months and at follow-up when children are 27-36 months. We then test whether health improvements were mediated by changes in women's empowerment and if this varied by the availability of resources. At baseline, there was no evidence that women's empowerment was positively associated with better nutritional status. At follow-up, children of mothers with higher spousal communication scores and more say in family planning decisions had better nutrition status. Preliminary results reveal that increased say in purchasing decisions partially mediated declines in wasting observed as a result of the program.

INTRODUCTION

Many current health promotion efforts in Africa South of the Sahara (SSA) emphasize the role of women in health care decision making, and aim to empower women to make decisions that benefit their own wellbeing and that of their children. A number of studies have demonstrated that women's empowerment is associated with better health outcomes (Shroff et al. 2009). However, conclusions from the current literature are based primarily on cross-sectional data (Cunningham et al. 2014). This limits the potential to disentangle the nature of the relationship between women's empowerment and child health (e.g., whether women's empowerment fosters child health improvements, the reverse is true, or if the association between the two is merely the consequence of unmeasured third variables).

In this paper we examine the relationship between women's empowerment and child nutritional outcomes using data from two waves of a cluster-randomized control trial of an integrated agriculture and nutrition program in Burkina Faso. Previous findings have demonstrated this program's positive effects on both women's empowerment (in the domains of purchasing decisions, healthcare decisions, and whether they meet with other women) and child health (higher hemoglobin concentration, lower prevalence of anemia, lower prevalence of wasting) (Olney, Pedahombga, Bliznashka, et al. unpublished manuscript; Olney, Pedahombga, Ruel, et al. unpublished manuscript). In this paper we test the extent to which women's empowerment mediates improvements in child health.

Women's empowerment is characterized as an evolving process whereby women develop the ability to exercise agency and make strategic life choices in domains where they were not previously able to do so (Kabeer 2005). This is distinct from women's status and characteristics such as educational attainment, many of which become relatively fixed after entering adulthood. In contrast, the empowerment of adult women is still evolving, and women may become empowered through various experiences and life events. In fact, many activities that target women beneficiaries aim specifically to empower women in economic or health domains (Kabeer 2005).

Child nutritional status is driven by maternal infant and young child feeding (IYCF) and care practices, dietary intake as well as disease (UNICEF 1998). Among Burkinabé children, mild to severe anemia is nearly universal, at 92% among children younger than 5 years, which is the highest in the world (Benoist et al. 2008). The prevalence (14%) of wasting (weight-for-height Z score <-2 SD) is the highest in SSA, and the prevalence (both 30%) of stunting (height-for-age Z score (HAZ) < -2 SD) and underweight (weight-for-age Z score (WAZ) < -2 SD) are also high (Institut National de la Statistique et de la Démographie (INSD) Ministère de l'Économie et des Finances, Ouagadougou, Burkina Faso et ICF International, Calverton, Maryland 2012). Women's empowerment may help mothers leverage available resources to improve IYCF and care practices, children's dietary intake, both in terms of quality and quantity, and to provide improved care for the prevention and treatment of diseases.

METHODS

Program description and evaluation design

The Enhanced Homestead Food Production (E-HFP) program was designed and implemented by Helen Keller International (HKI) in the area of Fada N'Gourma in eastern Burkina Faso. The program targeted mothers of children aged 3 to 12 months at the start of the program. It included both an agricultural component to promote small-scale agriculture among women and behavior change communication (BCC) programming targeted toward women. The agricultural component included both the provision of inputs and training by female village farm leaders. The BCC strategy focused on health and nutrition related knowledge with a particular emphasis on consumption of micro-nutrient rich foods among women and children. The BCC strategy employed a negotiating for behavior change approach designed to help women overcome barriers for adhering to good health and nutrition practices.

The E-HFP program was evaluated using a cluster-randomized control design. Villages were randomly assigned to either a control group (n = 25 villages) or one of two treatment groups, which differed only in who implemented BCC strategy. In one treatment group, BCC was implemented by Old Women Leaders (OWL) in the community (n = 15 villages); in the other treatment group health committee members (HC) implemented the BCC strategy (n = 15 villages).

Data

Household surveys were used to collect data at baseline (February-May 2010) and after two years of exposure to the program (February-June 2012). Households interviewed at baseline were interviewed again at follow-up. Both survey waves included household demographic and socio-economic characteristics, measures of women's empowerment, children's anthropometry, and children's hemoglobin. Trained staff measured and weighed children (Shorr Productions, Olney MD) and collected capillary blood via a finger stick to measure Hb concentration (Hemocue, AB, Angelholm, Sweden). All participants received information about the study and informed consent was obtained from either the household head or the mother of the selected child. The protocol was approved by the Ministry of Health of Burkina Faso, and the institutional review board of the International Food Policy Research Institute.

Women were asked about their contribution to household decisions, sources of social support, time they spend meeting with other women, and communication with their spouse (if he lived in the household). In previous analysis we used factor analysis to identify seven domains of women's empowerment that were present in the data: spousal communication, purchasing decisions, healthcare decisions, family planning decisions, infant and young child feeding (IYCF) decisions, meeting with other women, and social support (Olney, Pedahombga, Bliznashka, et al. unpublished manuscript).For further detail on these domains see **Table 1**. We do not use the domain ICYF decisions in the current analyses because of the limited variability of responses among the sample of interest.

Children with hemoglobin levels <10g/dL were considered moderately anemic. Children's weight and height/length were used to calculate their weight-for-height using the 2006 WHO growth reference standards (Borghi et al. 2006). Children smaller than two standard deviations below the mean Z score were considered wasted.

Analysis

We first examined the associations between each domain of women's empowerment and child nutritional status for each wave of data (i.e., baseline while children are 3-12 months old, follow-up when children are 27-36 months old). We used multivariate OLS to predict child hemoglobin levels and child WHZ scores (separately) and multivariate logistic regression to predict whether the child was moderately anemic or if the child was wasted (separately). In doing so, we controlled for potential confounding factors, including child age, child gender, relative housing quality, whether the household head had any formal education, whether the mother had any formal education, maternal age, and whether the household was polygynous.

In continued analysis, mediation analysis will be used to evaluate whether the integrated agriculture and nutrition program improved the nutritional status of children by operating, at least in part, through changes in women's empowerment (Hayes and Preacher 2013; Preacher et al. 2007). Specifically, we will test whether the program's positive impacts on child health (higher hemoglobin concentration, lower prevalence of anemia, and lower prevalence of wasting) were mediated by changes in women's empowerment and if the degree of mediation varies by the availability of food and healthcare resources.

PRELIMINARY RESULTS

Preliminary results revealed that at baseline, when children were between 3 and 12 months, there was no evidence that women's empowerment was positively associated with better child nutritional status when controlling for confounding factors. In fact in some cases, the coefficients were in the opposite direction of what was hypothesized. In contrast, when these same children were between 27 and 36 months several domains of women's empowerment were associated with better child nutritional status, after controlling for confounding factors. Children of mothers with higher spousal communication scores and mothers who had more say in family planning decisions had better nutrition and health status (for all four outcomes). Children of mothers who contributed more often to health care decisions also had lower odds of wasting **(Table 2).** Additionally, preliminary analyses reveal that improvements in the domain of purchasing decisions partially mediated the declines in wasting observed as a result of the program (proportion mediated = .12; $p<.10$).

REFERENCES

Benoist, B. de, McLean, E., Egll, I., & Cogswell, M. (2008). Worldwide prevalence of anaemia 1993-2005: WHO global database on anaemia.

Borghi, E., Onis, M. de, Garza, C., Broeck, J. V. den, Frongillo, E. A., Grummer-Strawn, L., et al. (2006). Construction of the World Health Organization child growth standards: selection of methods for attained growth curves. *Statistics in Medicine*, *25*(2), 247–265. doi:10.1002/sim.2227

Cunningham, K., Ruel, M., Ferguson, E., & Uauy, R. (2014). Women's empowerment and child nutritional status in South Asia: a synthesis of the literature. *Maternal & Child Nutrition*, n/a–n/a. doi:10.1111/mcn.12125

Hayes, A. F., & Preacher, K. J. (2013). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, n/a–n/a. doi:10.1111/bmsp.12028

Institut National de la Statistique et de la Démographie (INSD) Ministère de l'Économie et des Finances, Ouagadougou, Burkina Faso et ICF International, Calverton, Maryland, U. (2012). The DHS Program - Burkina Faso: DHS, 2010 - Final Report (French). http://dhsprogram.com/publications/publication-FR256-DHS-Final-Reports.cfm. Accessed 22 May 2014

Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1. *Gender & Development*, *13*(1), 13–24. Accessed 25 September 2014

Olney, D., Pedahombga, A., Bliznashka, L., Ruel, M., & Heckert, J. (unpublished manuscript). *An integrated agriculture and nutrition and health behavior change communication program in Burkina Faso positively impacts women's dietary diversity, prevalence of thinness and empowerment*.

Olney, D., Pedahombga, A., Ruel, M., & Dillon, A. (unpublished manuscript). *The impacts of an integrated agriculture and nutrition and health behavior change communication program targeted to women in Burkina Faso on children's growth and anemia: A cluster-randomized controlled trial*.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing Moderated Mediation Hypotheses: Theory, Methods, and Prescriptions. *Multivariate Behavioral Research*, *42*(1), 185–227. doi:10.1080/00273170701341316

Shroff, M., Griffiths, P., Adair, L., Suchindran, C., & Bentley, M. (2009). Maternal autonomy is inversely related to child stunting in Andhra Pradesh, India. *Maternal & Child Nutrition*, *5*(1), 64–74. doi:10.1111/j.1740-8709.2008.00161.x

Table 1: Domains and questions used to measure women's empowerment

Domain of women's empowerment	Question	Range, Alpha baseline, Alpha follow-up
Spousal communication	How often do you speak to your spouse about… 2=often; 1=sometimes; 0=never	0 to 14
	Your professional/agricultural activities	0.86
	Your domestic activities	0.95
	Your expenses	
	Events in your community	
	The health of your child	
	Your child's food	
	Your health	
Purchasing decisions	Can you make the decision to purchase the following items? (coded 0/1 whether she contributes)	0 to 8
	Small quantities of food, such as rice, vegetables, and beans?	0.89
	Larger quantities of food, such as bags of rice?	0.90
	Clothing for yourself?	
	Medication for yourself?	
	Toiletries such as soap and toothpaste?	
	Medication for children?	
	Special foods for your children?	
	Can you decide how to spend your money?	
Healthcare decisions	Which household members decide most often on the following issues? (coded 0/1 whether she contributes)	0 to 2
	Consult a doctor or go to a clinic when you are pregnant	0.57
	What to do when a child is sick	0.77
Family Planning Decisions	Which household members decide most often on the following issues? (coded 0/1 whether she contributes)	0 to 2
	Use a contraceptive method	0.66
	Have another child	0.64
IYCF Decisions	Which household members decide most often on the following issues? (coded 0/1 whether she contributes)	0 to 2
	If you breastfeed a child and when you wean	0.69
	How to feed the child during the first year of his or her life	0.57
Meeting with other women	Do you meet with other women in your community to discuss the following issues? (coded 0/1 whether she contributes)	0 to 5
	Community problems	0.90
	Educational problems	0.94
	Health problems	
	Problems specific to women	
	Receive information on health and nutrition	
Social support	Do you have someone who can help you when you have the following problems? (coded 0/1 whether she contributes)	0 to 4
	Host you for multiple nights if necessary	0.88
	Help you financially or lend you money	0.87
	Help you when you do not have enough food at home	
	Talk to you if you have problems	

Table 2: Coefficients for women's empowerment domains predicting child nutritional status
(Estimates control for household, mother, and child characteristics)

	Baseline (Children aged 3 to 12 months)				Follow-up (Children aged 27 to 36 months)			
	Hemoglobin	Moderate anemia	Weight-for-height Z-score	Wasted	Hemoglobin	Moderate anemia	Weight-for-height Z-score	Wasted
Spousal communication	-0.034*	0.049*	-0.007	0.006	0.036**	(-0.054)	(0.040)	(-0.087)
	(0.021)	(0.026)	(0.020)	(0.031)	(0.016)	0.020	0.010	0.034
Meetings with other women	-0.042	0.030	-0.007	-0.011	-0.049**	(0.042)	(-0.002)	(-0.012)
	(0.030)	(0.039)	(0.036)	(0.045)	(0.024)	0.036	0.018	0.066
Purchasing decisions	0.003	-0.028	-0.006	-0.004	0.019	(-0.015)	(-0.012)	(-0.047)
	(0.020)	(0.026)	(0.025)	(0.034)	(0.018)	0.025	0.012	0.039
Social support	-0.061	0.150***	-0.001	-0.017	-0.018	(0.041)	(-0.030)	(-0.016)
	(0.046)	(0.052)	(0.042)	(0.055)	(0.031)	0.047	0.025	0.085**
Health care decisions	-0.098	0.038	-0.011	0.004	0.004	(0.036)	(0.028)	(-0.280)
	(0.073)	(0.090)	(0.081)	(0.097)	(0.054)	0.069**	0.034**	0.135**
Family planning decisions	-0.086	0.007	-0.060	0.059	0.143***	(-0.175)	(0.088)	(-0.318)
	(0.076)	(0.106)	(0.074)	(0.093)	(0.054)	(0.071)	(0.041)	(0.145)
Sample size spousal communication	1,102	1,202	959	959	1,019	1,019	893	893
Sample size other 5 domains	1,189	1,189	1,041	1,041	1,171	1,171	1,029	1,029

note: *** p<0.01, ** p<0.05, * p<0.1