

DO CARE GIVERS MATTER ON THE PHYSICAL HEALTH STATUS OF THE CHILDREN LEFT-BEHIND BY RURAL-URBAN MIGRANTS? EVIDENCE FROM NIGER STATE, NIGERIA

By

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ABSTRACT

Rural-urban migrants in Nigeria often leave their children behind in the hands of parents or non-parent caregivers, when migrating. Although, most of the migrants send remittances to enhance the lives of the children, little is known about the role of the caregivers in achieving this objective. Using a sample of 401 left-behind children from rural areas of Niger State, this study investigates the impacts of caregivers on the probability of the children being in the adequate, moderately malnourished or severely malnourished health status. The result shows that children under the care of mothers are more likely to be in the adequately nourished health category, and a year increase in the education of the caregivers increases the probability of the children being in the adequately nourished health status. It is suggested that mothers should provide the care, while fathers should migrate and health sensitization should be provided by the government to the caregivers of the left-behind children in the state.

Key words: Left-behind children, Caregivers, Education of the Caregivers, Physical Health

1. Introduction

Rural-urban migration, which is the movement of people from rural to urban centers, is the dominant form of internal migration in Nigeria, and is often associated with leaving children behind in the rural origin. It is reported that over 21% of the Nigerian children, who are non-orphans, lived with at least one of their biological parents away (Nigerian Demographic and Health Survey—NDHS, 2008). However, in the North Central Zone, where Niger State belongs, over 30% of the children live with at least one of their parents migrated (NDHS, 2004), a figure that is above the national average of 19%, which calls for concern.

Migrant parents might leave their children behind due to the cost or risk considerations of moving along with the family, or due to the altruistic decision to send remittances that might be used to improve the well being of the left-behind family, including children (Amuedo-Dorantes and Pozo, 2009; Anto'n, 2010; Carletto, Covarrubias & Maluccio, 2011; López-Cevallos and Chi, 2012; Amakon and Iheoma, 2014; Ofuoku, 2015)

Rural-urban migrants' remittances constitute the major share of the remittance flow to rural areas in Nigeria and it provides a poverty alleviation mechanism to the rural left-behind households (Chiwuzulum, Taiwo & Omonona, 2010). In the absence of formal insurance, migrants' remittances

also provide a substitute against agricultural and health risks, which is a common experience in the rural households of the country (Dillon et al., 2011; Gubert, 2002). However, whereas migrants may send remittances for the provision of health and nutritional demands of the children, the utilization of such remittances in the production of child health may depend on caregiver characteristics (Jayatissa and Wickramage, 2016).

Mothers are, for instance, normally more altruistic to the welfare of their children (Alger and Cox, 2013). Mothers also have child rearing endowments and are better at providing the emotional needs of their children (Peng and Wong, 2015). Since emotion affects feeding behavior (Benton, 2004), and maternal endowment affects child's health and nutrition (Barrera, 1990), remittances sent to the mothers' caregivers might be more beneficial to the nutritional and health status of the left-behind children than that sent to father or non-parent caregivers (Duflo and Udry, 2004).

On the other hand, empirical evidence has shown that when mothers make greater contribution to the household's income, and they spend more time in the labor markets (e.g as in the case of migrant mothers), fathers make more participation in the routine care of the children (Raley et al., 2012). However, the ability of the caregivers to utilize remittances in the production of the children's health may also

be affected by their level of education, which may determine their ability to utilize health and nutritional information, provide environmental sanitation and also seek the relevant medical care for their children in case of need (Babalola and Fatusi, 2009).

When the care of the left-behind children is, however, entrusted in the hands of the non-parent's caregiver, remittances may be enhanced due to the potential dual remitting of the mother and father, but the utilization of such remittances may be exposed to the vagaries of moral hazard, whereby the remittance may not be fully utilized in the production of the children's physical health (Fama, 1980; Ross, 2000). Conversely, in environments where there is norm of social parenthood like in Niger State, children under the care of non-parents' may benefit from proper care due to the cultural practice of child fostering, whereby relatives are used to caring for their non-biological children, regardless of migration (Abubakar et al., 2013; Encyclopedia of World Cultures Supplement, 2002; Shekwo, 1988). Therefore, the impact that different caregivers may have on the physical health of the left-behind children in this cultural context may be complex and requires empirical investigation.

Since child's health has implication for education, adulthood health and future economic opportunities (Case et al., 2005), understanding the impacts of caregivers on the physical health of the left-behind

children may benefit parents in making migration decision and in providing the proper guardianship of their children.

However, with the exception of Cebotari, Mazzucato and Siegel (2017), empirical studies that investigated the impacts of caregivers on the physical health of the left-behind children are limited. Although Cebotari et al (2017) have investigated the impacts of caregivers on the health of the left-behind children; their study uses self-rated reports of the children's health as a measure of their physical health. Self-rated report may be subjective to the worries and concerns of the children in the family (Donato and Duncan, 2011). Moreover, self-rated report is often gender and socio-economically biased. Women are more likely to report poorer health than men and more educated people and those within the upper income class are also more likely to report poorer health than less educated people and those within the lower income brackets (Tang, Zhao & Li, 2017). Anthropometric indicator (weight-for-age) was, therefore, used as a measure of the left-behind children's physical health in this study. This indicator is more suitable for infants and children; can screen children at risks, and can determine short-term changes in health and nutrition of the children (O'Donnell & Wagstaff, 2008). Therefore, this study makes two main contributions. First, it investigates the impacts of caregivers on the three categories of the children's health statuses (i.e. adequately

nourished, moderately malnourished and severely malnourished). Second, it determines how the education of the caregiver affects the three categories of the health statuses of the children. The article is, however, presented in six sections, which include the introduction, theoretical framework, methodology, results, discussions and conclusion.

Research Question

Do the caregivers of the left-behind children in rural areas of Niger State have impacts on their physical health statuses?

Does an increase in the education of the caregivers affect the physical health statuses of the left-behind children in rural areas of Niger State?

Research Objectives

To find out how the caregivers of the children left-behind by rural-urban migrants affect their physical health statuses.

To determine how increases in the education of the caregivers of the left-behind children in rural areas of Niger State impacts on the physical health statuses of the children.

Hypotheses

H_a: Left-behind children who are cared for by their mothers are expected to have better physical health status than those under the care of fathers or non-parent caregivers.

H_b: An increase in the education of the caregivers is expected to yield better health outcome for the left-behind children.

2. Theoretical framework

The health production function of Grossman (1972) is used as the underpinning theory of this study. The theory stipulates that each individual is a producer and consumer of health, and that health is a stock that degrades over time if investment in it is not made. Also, according to the theory, health is both a consumer good that gives direct utility and also an investment good that gives indirect satisfaction to the consumers through reduced sickness, increased productivity and higher wages. Therefore, parents maximize health investment by choosing the health inputs, such that the value of the gross health investment equals the marginal benefits. The production of child's health is, therefore, determined by the primary caregivers.

3. Methodology

3.1 Data and Sample

The data for this study was collected from a sample of 401 left-behind children aged 6-10 years in rural areas of Niger State, Nigeria. Stratified sampling technique was first adopted to select three local governments from the three geopolitical zones¹ of the state. In each of the three selected local governments, a random sample of 45 left-behind households were

¹The three geopolitical zones are Zone A, Zone B and Zone C.

selected, such that data on 405 left-behind children and their caregivers were obtained from the selected households. Four questionnaires had incomplete observations and were dropped, leaving a sample of 401 respondents. The sample consists of children within the age brackets of six to ten years, whose at least one parent has migrated for at least three months.

3.2 Dependent variable

The dependent variable is the physical health status of the left-behind children. The weight-for-age, which is one of the Anthropometric indicators of physical health status, and which is suitable for measuring the short term changes in the nutritional status of the children, was used as the measure of the physical health of the children. This measure is considered appropriate because parents may be engaged in a temporary form of migration, and thus left-behind children may experience temporary changes in their physical health due to the influence of care arrangement or remittance receipt. The weight-for-age was determined using z-scores. To derive the z-scores, the weights of the children was measured using a digital scale, and their ages in years and months as well as gender, were recorded. Each child's weight was compared with child of the same age and gender in the World Health Organizations (WHO) reference category. However, WHO's Anthropometry dedicated software (Anthro), was used to generate all the z-scores. All the z-scores were recorded

from 3-1 based on the WHO's specification. The z-scores that are in the range of, $-2 < Z < +2$, represents adequate nutritional health status, and were recorded as 3; the z-scores in the range of, $-3 < Z < -2$, represents moderately malnourished health status, and were recorded as 2, while the Z-score that are < -3 , represents severely malnourished health status, and were recorded as 1.

3.3 Independent variables

The key independent variables of interest in this study are the caregiver status, education of the caregiver and remittances. The values of 1, 2 and 3 were assigned to the mother, father and non-parent caregivers respectively. Education of the caregiver was measured as a continuous variable for the number of years of education of the caregiver. To provide anonymity, remittances were asked in range format and the average from each range choosing by the respondent represents a continuous value for the remittance received per month, by the left-behind household. However, child's physical health endowment, non-remittance family income, child's living condition, age and gender were added to the list of independent variables as controls. When a child has a history of poor physical health, e.g sickle cell anemia, before parents' migration, a value of 1 was assigned, while 0 otherwise. Non-remittance family income was measured in range, and the average of each range was used as a continuous measure of non-remittance family income. The child's living condition was measured

as the ratio of the total number of people living in the left-behind household to the total number of rooms in the households. Age was measured in years while gender was measured as 1 and 0 for male and female respectively.

3.4 Method of data analysis and model specification

The data for this study was analyzed using descriptive statistics. The parameters of the study's model was, however, estimated using the Ordered Logit regression model, due to the ordinal nature of the dependent variable (Cameron and Trivedi, 2005). The descriptive statistics provide some important information about the

$$Pr(PH_i) = \beta_0 + \beta_1 Cgvr_i + \beta_2 Ecgv_i + \beta_3 Rem_i + \beta_4 Cphe_i + \beta_5 Clct_i + \beta_6 Ficm_i + \beta_7 Age_i + \beta_8 Gender_i + \mu_i \dots \dots \dots (1)$$

where: cgvr, is the caregiver of the left-behind child; Ecgv, is the education of the caregiver; Rem, is remittance; Cphe, is the child's physical health endowment and Clct, is the child's living condition. Age and gender refers to the age and gender of the left-behind child.

parents' migration, only 1% of the children were having history of poor physical health while 99% were not. The percentage of the male left-behind children among the respondent was 49.88%, while the female was 50.12%.

4. Results

4.1 Descriptive analysis

As can be seen in Table 1, over 96.76% of the left-behind children under study were within the adequately nourished health status, 2.49% of them were moderately malnourished while only 0.75% of them were severely malnourished. Concerning the characteristics of the caregivers, 93.02% of them were mothers of the left-behind children, 1.25% of them were fathers while 5.74% of them were non-parent caregivers. On whether the left-behind children had any history of poor physical health before the

The average level of the education of the caregivers was 12 years with a minimum of 1year and maximum of 17years. The mean of the monthly remittances received by the left-behind households was N17, 987 (\$50), with a minimum of N7,501(\$21)² and a maximum of N27, 501(\$76). The average non-remittance monthly family income was N9,772 (\$27), with a minimum of N 2500 (\$9) and a maximum of N 42, 501(\$118). The mean age of the left-behind children was 8years with a minimum of 6years and a maximum of 10years.

²At the exchange rate of \$1= N 360

Table 1: Socio-demographic Profile of the Left-behind children and their Caregivers
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Variables	Frequency	Percentage	Mean	Min	Max
Adequately Nourished	388	96.76			
Moderately Malnourished	10	2.49			
Severely Malnourished	3	0.75			
Caregivers					
Mother Caregivers	373	93.02			
Father Caregivers	5	1.25			
Non-parent Caregivers	23	5.74			
Child's P/Health Endowment					
History of Poor Physical Health Exists	4	1			
No History of Poor Physical Health	397	99			
Child's Gender					
Male	200	49.88			
Female	201	50.12			
Education of the Caregiver			12	1	17
Remittance			17987	7501	27501
Family Income			9772	2500	42501
Child's Age			8	6	10
Child's Living Condition			4	1	21

P/health, means physical health. Min, means minimum while max, means maximum

4.2 Ordered Logit regression result

The ordered Logit coefficients in Table 2 shows that the coefficients of the father's caregiver, education of the caregiver, remittances, child's physical health endowment and age were statistically significant at 1%, 10% 10%, 1%, and 1%, respectively. The coefficient of the father's caregiver was negative, and thus implies that compared to the left-behind children under the care of mothers (reference category), children under the care of fathers are less likely to be in the better (adequately nourished) health

category. This confirms the hypothesis H_a that left-behind children who are under the care of their mothers are expected to have better physical health than those under the care of their fathers or non-parent caregivers. The coefficient of the education of the caregivers was also positive, therefore indicating that, a one year increase in the education of the caregiver increases the probability that the left-behind child will be in the better (adequately nourished) health status. This also confirms the hypothesis

Table 2: Ordered Logit Regression Coefficients
 Dependent Variable: Physical Health Status of the Left-behind children

Variables	Coefficients	Robust Standard Errors	P-values
Father C/giver	-12.20963	0.8170264	0.000***
Non-Parent C/giver	-1.533333	1.033515	0.138
Education of the C/giver	0.1705411	0.0850649	0.045*
Remittances	2.47387	1.407243	0.079*
Child's Living Condition	-4.720089	1.279827	0.000***
Family's Income	-0.0665989	0.0898596	0.459
Child's Age	-1.021923	0.6625945	0.123
Child's Gender	0.9203663	0.2446457	0.000***
/cut1	-1.30327	0.9695062	0.179
/cut2	16.72377	9.502699	
	18.66236	9.715337	

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Where: C/giver, means caregiver; P/Health Edmnt, means physical health endowment.

The results in Table 3 show the average marginal effects of the ordered logit coefficients. The result shows that father caregiver was negative and statistically significant at 1% under the column of adequately nourished health status, but was positive and statistically significant at 5% under the column of moderately malnourished health category. This means that, left-behind children under the care of fathers are 2.7% less likely to be in the adequately nourished health status and 2% more likely to be in the moderately malnourished health status, as compared to their peers under the care of mothers (reference category).

Similarly, the education of the caregivers was positive and statistically significant at the

10% level under the column of adequately nourished health category, but negative and statistically significant at the 10% level under the column of moderately malnourished health status. This means that a one year increase in the education of the caregivers is associated with the probability that the left-behind child will be in the adequately nourished health category by 0.4% and reduces the probability that the left-behind child will be in the moderately malnourished health category by 0.3%. Also, remittance was positive and statistically significant at the 10% under the column of adequately nourished health category, which means that a one Naira increase in the remittance receipt increases the probability that the left-behind child will be in the adequately nourished health category by 6%.

Furthermore, the age of the left-behind child was positive and statistically significant at the 5% level under the column of adequately nourished, but was negative and statistically significant at the 5% level under the column of moderately malnourished health status. This implies that, a one year increase in the age of the left-behind child increases the probability that the child will be in the adequately nourished health category by 2% and reduces the probability that the child will be in the moderately malnourished health category by 1.5%.

However, the child's physical health endowment

was negative and statistically significant at the 5% level under the column of adequately nourished, but was positive and statistically significant at the 5% level under the column of moderately malnourished health status. This therefore means that, compared to the left-behind children who did not have a history of poor physical health (reference category), those who have a history of poor physical health before parents' migration are 10.7% less likely to be in the adequately nourished health status and 8% more likely to be in the moderately malnourished health category.

Table 3: Marginal Effects of the Ordered Logit Model for the Three Categories of Physical Health Status

Dependent Variable: Physical Health Status of the Left-behind children

Independent Variables	Adequately Nourished Health Status	Moderately Malnourished Health Status	Severely Malnourished Health Status
Father C/giver	-0.0270473*** (0.0073176)	0.0208393** (0.0067081)	0.006208 (0.003866)
Non-Parent C/giver	-0.0564033 (0.0558685)	0.0427458 (0.0394449)	0.0136575 (0.0179633)
Edu. of C/giver	0.0038593* (0.0020279)	-0.0029237* (0.0016858)	-0.0009355 (0.0006071)
Remittance	0.0559824* (0.03222)	-0.0424115 (0.0299047)	-0.0135709 (0.0089752)
Child P/H Endmnt	-0.1068132** (0.0350489)	0.0809203** (0.028361)	0.0258929 (0.0159908)
Child's Lving Cdtm	-0.0015071 (0.002065)	0.0011418 (0.0016256)	0.0003653 (0.0004806)
Family's Income	-0.0231256 (0.0163759)	0.0175196 (0.0136165)	0.0056059 (0.0039715)
Child's Age	0.0208274** (0.0075519)	-0.0157786** (0.0058361)	-0.0050488 (0.0033335)
Child's Gender	-0.0294923 (0.0224286)	0.022343 (0.0171794)	0.0071493 (0.0066273)

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Where: C/giver, means caregiver; Edu., means education; P/H Endmnt, means physical health endowment, while Lving Cdtm, means living condition.

4.3 Post estimation diagnostics

Table 4 of the appendix shows the result of the post estimation tests. The joint P-values of all the variables in the *Brant test*, was not statistically significant (0.133), which implies that parallel line assumption was not violated. The P-value of the χ^2 (0.125) in the Linktest, was also not statistically significant, thereby supporting the null hypothesis that the model is correctly specified. The Variance Inflation Factor (VIF) and the Tolerance values were less than 10 and close to 1 respectively, which implies that Multicollinearity does not exist among the covariates in the model. The goodness-of-fit of the model was tested using the BIC and AIC criterion. Two models were tested, the saved model and the current model. The saved model include two variables of interests, while the current model does not. The difference between the two models, as shown by the BIC is 7.02, which implies strong evidence that the saved model fits the data better (Raftery, 1995).

5. Discussion

Rural-urban migration is the most common form of internal migration in Nigeria. When parents migrate, their children are mostly left-behind in the rural areas, particularly due to the temporary migratory nature of some migrants, as well as the risks and costs consideration of moving along with the family. The academic community world over, has raised concern over the potential impacts of this form of migration on the health of the left-behind children.

However, with the exception of Cebotari et al (2017) who uses self-rated reports of children's health, most of the previous empirical evidence focused on the impacts of remittances on the health of the children. Whereas remittances might be one of the inputs in the children's health production function, caregivers are required to organize these inputs for the production of the children's health. Also, self-rated reports might be subjective (Donato and Duncan, 2011), and might not be suitable for children (O'Donnell & Wagstaff, 2008). Therefore, using the standard indicator of children's health, and collecting a cross-sectional data from Niger State, this study investigated the impacts of caregivers and the education of the caregivers on the physical health of the left-behind children.

The results of this study, first, show that left-behind children under the care of mothers are more likely to be adequately nourished than those under the care of fathers or non-parent caregivers. This result contradicts the previous finding that the health of the left-behind children under the care of non-parent caregivers does not suffer (Mazzucato and Schans, 2011). This might be because mothers are more altruistic to the welfare of their children than fathers and non-parent caregivers (Alger and Cox, 2013).

Secondly, a one year increase in the education of the caregivers increases the probability that the left-behind children will be in a higher health category (adequately

nourished) and reduces the probability that they will be in lower health status (moderately malnourished). This implies that, whereas being under the care of mother increases the probability of being in a better health category, only the education of the caregiver reduces the risk of being in a lower health status. This might be due to the importance of education in the utilization of health and nutritional information, providing environmental sanitation and seeking the relevant medical care supports in case of need (Babalola and Fatusi, 2009).

The results of the additional covariates in the study's model, that were found to be statistically significant include those of remittances, child's physical health endowment and age. A one Naira increase in remittance receipt was found to be associated with increasing the probability that the left-behind child will be in a better health category. This might be because remittances increase the ability of the left-behind households to providing nutrition and medication for their children (Amuedo-Dorantes and Pozo, 2009; López-Cevallos, 2012). A one year increase in the age of the left-behind child was also associated with the probability of making the left-behind child to be in a better health category and reduces the probability of the child being in a lower health status. Children who have a history of poor physical health before parents' migration were found to be less likely to be in better health category and more likely to be in a lower health status

than their peers without poor physical health history.

6. Conclusion

Contrary to the previous findings in the West-African context that the health of the left-behind children under the care of non-parent caregivers might be as good as that of the children under the care of their mothers, this study found that left-behind children under the care of their mothers are more likely to have better physical health than their peers under the care of non-parent or father caregivers. However, education of the caregivers not only increases the probability of the left-behind children having better physical health, but also reduces their probability of being in the lower physical health category.

Based on the findings of this study, it is therefore recommended that fathers should migrate and mothers wait and provide proper care for the children. Also, government should provide health and nutritional knowledge to the caregivers as a means of improving the health of children under their custody.

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Appendix:
Table 4:
Post Estimation Tests for the Ordered Logit Regression

Tests	Measures	
Parallel Line Assumption		
Brant Test	P-value	
All	0.133	
Caregiver	0.247	
Education of the Caregiver	0.460	
Remittance	0.129	
Child's P/health Edowment	0.192	
Child's Living Condition	0.376	
Family Income	0.172	
Age		0.753
Gender	0.511	
Model Specification Test		
Linktest		
_hat	0.210	
_hatsq	0.125	
Multicollinearity Test		
	Tolerance	
Caregiver	0.9922	
Education of the Caregiver	0.5266	
Remittance	0.4431	
Child's P/health Endowment	0.9886	
Child's Living Condition	0.9800	
Family Income	0.5639	
Age	0.9781	
Gender	0.9822	
Variance Inflation Factor (VIF)		
Caregiver	1.00	
Education of the Caregiver	1.38	
Remittance	1.50	
Child's P'health Endowment	1.01	
Child's Living Condition	1.01	
Family Income	1.33	
Age	1.01	
Gender	1.01	
Test for Goodness-of-fit		
Models		
	AIC	BIC
Current Model	106.142	138.054
Saved Model	105.226	145.115
Difference	0.916	-7.062