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DOES MOTHERS' EDUCATION INFLUENCE CHILDREN'S NUTRITIONAL STATUS? EVIDENCE FROM FARMING HOUSEHOLDS IN KWARA STATE, NIGERIA

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Absract

Children's health is of great importance within the household most especially to their mothers. The level of educational attainment among these mothers can result in their knowledge of, access to and ability to process specific information most especially as regard the health of their children. Using survey data from 127 farming households in 40 villages, this article examined the effect of mothers' education on the nutritional status of children in the study area. The results of the study revealed that majority of the mothers representing 46.5% have undergone between 1 to 5 years of schooling. A total of 22% of the children are underweight, 23.6% are stunted and 14.2% of the children are wasted. The results showed that the significant determinants of children nutritional status in the study area include household size, mothers' education, access to sanitary toilet and access to clean water. The findings therefore suggests that if malnutrition in children is to be reduced, the education of mothers should be promoted as well as the provision of basic amenities such as safe and portable water as well as good sanitation facilities.

Keywords: *mothers' education, children, nutritional status, Kwara.*

INTRODUCTION

Malnutrition is the insufficient, excessive or imbalance of consumption of nutrients or a medical condition caused by an improper or inadequate intake of diet and nutrition (Sullivan and Steven, 2003). Malnutrition is a severe public health problem in Sub-Saharan Africa with about 35 per cent of preschoolers stunted, 29 per cent are underweight, while the mortality rate of children below the age of five is 60 per cent (Leenstra *et al.*, 2005). Malnutrition has both short and long term adverse effects. In the short-term for the individual, it is associated with ill health and mortality (WHO, 2002). In the long-term, it leads to impaired cognitive development, poorer educational achievement and economic productivity (Victora *et al.*, 2008 and Grantham-McGregor *et al.*, 2007). The nutritional status of children influences their health status, which is a key determinant of human development. Therefore, improvement of children nutritional status does increase the chances of child survival and is considered as a precondition for their contribution to community as well as human development (UNICEF, 1998).

In Nigeria, 11 million people (8.5 per cent of the population) are undernourished, 29 per cent of children are underweight, 34 per cent of children are stunted, 53.3 million people (41 per cent of the population) are food insecure, under five mortality is 198 per 1000 live births and maternal mortality is 800 per 100,000 live births (FAO, 2005). Furthermore, farming households represent about 60 per cent of rural dwellers. Most of these rural areas are plagued with the problem of inadequate water supply, poor drainage, and poverty thereby leading to poor health of households. According to Gould (1998), the effects of these unhealthy conditions include diarrhea outbreaks for long periods of time

which leads to instances of malnutrition. About 1 million children under the age of 5 years die every year. This translates into 114 deaths every hour. One out of every four of these deaths (about 250,000) is of a newborn baby of less than one month old. These children die mainly from: Complications of low birth weight; inability to begin breathing after birth (asphyxia) and infections such as malaria and pneumonia. Research has shown that the level of resistance to diseases is lower for malnourished children resulting in high level of mortality (UNICEF, 2011).

Investing in women's education is widely advocated as a key intervention strategy for promoting child health. Beginning with the work of Caldwell (1979), a considerable body of research suggests that maternal education is the single most important factor in explaining differentials in child health outcomes, more important than paternal education, health service availability, and socioeconomic status (Young e*t al.,* 1983). It has been shown from studies in all major regions of the developing world that there is a linear relationship between education and childhood mortality (Bicego and Ahmad, 1996). A mother's education may affect her child's nutritional status through a variety of channels.

One of the most commonly research links between maternal education and children's health is socioeconomic status, especially the mothers' income. Women with higher education are more likely to find a superior, steadier job that pays well so they can more consistently supplement the family's income. These higher levels of income reflects in more money that can be spent on nutritious food, warm clothing, medicine, and health care services that can directly impact on children's health (Barrett and Browne, 1996). Education also facilitates mothers' learning about the causation, prevention, recognition, and cure of disease, as well as nutritional requirements that can subsequently affect their health behavior. It also leads to greater exposure and better understanding of health messages and recommendations through mass media or other sources. This implies that mental understanding of the health process directly impacts behaviors focused on improved health. This is because acquired knowledge is expected to lead to greater protection against infection through improved hygiene, reduced susceptibility to infection through nutrition, and enhanced recovery from infection through more effective domestic and external health care (Defo, 1997).

In addition to basic health knowledge, education can also influence attitudes about health behavior by producing a shift away from traditional beliefs and practices, leading to a greater receptivity to novel ideas and practices, and a more frequent acceptance of rational explanations of disease and modern medicine. Thus, mothers with higher levels of education will readily accept modern medicine, use preventive health services, take their children to a medical center, and less likely to attribute the future health of their child to fate (Bicego and Boerma, 1993). Female education can also influence child health by increasing the decision-making power of women within the family. Women generally are the primary care givers in their home, devoting more time to the protection and care of their children than men. Mothers, therefore, are usually the first to recognize when a child is sick. However, in many traditional cultures uneducated women often do not act until other traditional figures notice the child's illness. Increased maternal education changes the traditional balance of power in family relationships, granting educated women more authority. Educated mothers feel personally responsible for their children and are more likely to draw attention to the illness, demand that action be taken, and take a sick child to the health clinic, rather than deferring decisions to traditional authority structures (Caldwell, 1993).

According to Saraswathi (1992), an increase in mother's control over family income is

associated with improved nutritional status for female infants. Another study revealed that the survival of a mother's children is positively associated with her autonomy level (Kishor, 1995). Jejeebhoy (1995) linked education with maternal decision-making autonomy and increased child survival. The more education a woman receives, the more likely she is to be the primary decision-maker with regards to her children's health.

However, in most developing countries Nigeria inclusive, the education of the girl child who eventually becomes a mother is greatly hindered by cultural, economic and institutional factors. Previous studies (Bicego and Ahmad, 1996) on children's malnutrition concentrated on the nutrient deficiency factor with little or no reference to maternal education's influence. This study therefore aims at providing good background knowledge on mothers' education and children's nutritional status especially among farming households in Kwara state, Nigeria. It will also help in providing information that will be useful in the formulation of appropriate policies and programmes that would help in combating the scourge of malnutrition in Kwara state and Nigeria as a whole.

METHODOLOGY

Study Area

The study was conducted in Kwara state in the north-central zone of Nigeria. The study has a population of about 2.4 million people, 70 per cent of which are peasant farmers (KWSG, 2006). Kwara state lies between latitudes 7^0 45' N and 9^0 30' N of the equator and longitudes 2^0 30' E and 6^0 25'E of the equator. The state was created on the 27th of May, 1967 and share boundaries with Osun, Oyo, Ondo, Kogi, Niger and Ekiti states. The state is also made up of 16 Local Government Areas divided into four agro-ecological zones. Kwara state was chosen for this study based on the following criteria:

- The availability of important framework for the sampling such as village lists, household lists and details on farm-household systems.
- The nationwide living standard measurement survey (LSMS) conducted in 2004 shows that the state is among the six poorest in Nigeria.

Sample size and Sampling Technique

A multi-stage random sampling technique was used in selecting 127 farming households across eight (8) local government areas of Kwara state for the study. These farming households were selected using the complete village household lists provided by the Agric and Rural Development department of the local government areas.

Data collection

Primary data were collected from 127 farming households using structured questionnaire and personal interview. Data collected include households' socio-economic characteristics, living condition, food consumption patterns, nutritional status, anthropometric data (weight, height, age of children and adult members in the households), livelihood patterns and their coping strategies. The food consumption data was collected through a 7-day food recall technique covering 105 food items.

Analytical techniques

Anthropometric analysis

Anthropometry is a technique that uses human body measurements to draw conclusion about the nutritional status of individuals in a given population. This technique is often applied to pre-school children below the age of 5 years. Anthropometric analysis is done using variables such as the child's age, sex, height, weight and mid-upper-arm-circumference (MUAC). These measurements are used in generating indices such as height-for-age, weight-for-age, weight-for-height and MUAC-for-age.

Children are classified as moderately and severely stunted (chronic malnourished), wasted (acutely malnourished) and under-weighted (stunted, wasted or both) using these indices. The height for age, weight for height and weight for age Z-scores are calculated as:

$$\frac{\text{Height of child – median height of population}}{\text{Standard deviation of the reference population}} \qquad P_i(y) = f(Z_i) \qquad Z_i = X + \mu$$

The indices generated are then compared with standard reference values of the National Center for Health Statistics (NCHS) to obtain the Z-scores. For example, the height-for-age Z-score is given as:

$$Z = X - \mu/\sigma$$

Where

X = child's height-for-age

μ = median height-for-age- of the reference population of children of the same age and sex group

σ = standard deviation of the reference population

From the z-scores, the nutritional status of the child is inferred as follows:

- A child whose height-for-age Z-score is less than -2 is regarded as stunted
- A weight-for-age Z-score is less than -2 is underweight
- A weight-for-height Z-score of less than -2 is regarded as wasted (WHO, 1995)

Logit model

This model postulates that the probability (p_1) that an individual (A mother) is educated is a function of an index (z_i).

Where P_i = logit probability

Y = Dependent variable which is the malnutrition index which is 1 if a child is stunted, underweight or wasted and 0 if otherwise.

Z_i = explanatory variables

β = vectors of parameters' estimates

X_i = vectors of the independent variables.

The explanatory variables for this model include the sex of the child (male =1, female = 0), age of the child (months), educational level of mothers (years), educational level of household head (years), total income of the household, household assets, household size, calorie intake of the households, access to clean water and the presence of sanitary toilets among others.

RESULTS AND DISCUSSION

Socioeconomic characteristics

The results in Table 1 show the summary of the socio-economic characteristics of the respondents. The average age of the children was 4.14 years and about 52 per cent of the children from these farming households are of the male gender. The average education of the household head was 7 years while that of the mothers was 3 years. This shows that the mothers are not as educated as the fathers in most of the farming households. The average household assets in monetary terms was valued at N71,700 with an average household size of 5 in adult equivalence and an average income of N29,447 per month for the households. The mean value of calorie intake of the respondents was 2,239Kcal/AE/day justifying the fact that majority of the households are food insecure based on the 2,500Kcal/AE/day recommended caloric intake (WHO, 1995).

Nutritional Status of the Children

The malnutrition indices (stunting, wasting and underweight) shown on Table 2 were

measured such that a stunted child is scored '1' while a child who is not is scored '0'. The mean values of the respondents that are stunted, wasted and underweight were estimated at 0.24, 0.14 and 0.22 respectively. This implies that only 24 per cent of the respondents are stunted, 14 per cent are wasted and 22 per cent are underweight.

This result showed that majority of the children were found not to be wasted, stunted or underweight. This could be attributed to many reasons, one of which could be the fact that most of the mothers of the sampled farming households were educated (with an average education of 3.3 years, as seen in Table 1) and as such use their acquired education to distribute their income efficiently to ensure that the nutritional needs of the children are met to the best of their ability.

Determinants of malnutrition among Children

Table 3 shows the results for the determinants of malnutrition using the logit regression model. The variables found to be significantly influencing malnutrition in children are the sex of the children, age of the children, access to sanitary toilets and access to clean water. The sex of the children and access to sanitary toilets were found to be negatively significant. This implies that a unit increase in number of male children reduces malnutrition in the form of underweight and stunting by 1.38 and 1.30 units respectively, while a unit increase in accessibility to sanitary toilets reduces malnutrition (underweight) by 2.50 units. Also, access to clean water was negatively significant implying that a unit increase in the accessibility to clean water reduces malnutrition (stunting) by 1.44 units.

The results in Table 4 show the regression result using the Cobb-Douglas function. The value of the R^2 signifies that this model explained 13.2 per cent, 23.1 per cent and 16.8 per cent of the total variation in the stunting, underweight and wasting status of the children respectively. Using the result of Table 4, we found that household size and access to sanitary toilet were the significant variables that affect child's stunting in the area. The household size is negatively related to child's stunting implying that an increase in the household size by 1 unit increases the chances of stunting in the children by 0.74 units. This means that larger families are more likely to have stunted children than smaller families. On the other hand, accessibility to sanitary toilets was found to be positively related to child's stunting. This implies that an increase in accessibility to sanitary toilets reduces the chances of the children being stunted by 0.119 units. This is because access to sanitary toilets creates a healthy environment that is free from diseases. This result is consistent with that of Khan and Gill (2008) that were of the opinion that knowledge of and access to good sanitary behavior and the household size (these are examples of ways through which mothers' education manifests) are major factors influencing the nutritional status of children.

The variables that were found to be driving the probability of a child being underweight are the age of the children, total income of the households and access to sanitary toilets. All these variables were negatively related to child's underweight. This indicates that a unit increase in any of these variables will increase the chances the children being underweight thereby increasing malnutrition by 0.830, 0.271 and 0.321 respectively. The results for these variables do not conform to *a priori* expectation in which malnutrition is expected to decline with increase in household income, access to sanitary toilets and as the age of the children increases, this may be due to the fact that sample size is small resulting in sample bias. The mothers' education was the only variable that was found to influence wasting in children. Mother's education was positively and significantly related to child's wasting at 1 per cent and this implies that a

unit increase in the education status of the mother reduces the chances of wasting among the children. This could be because the education of mothers improves the status and intelligence of mothers thereby enabling them to know and provide the nutrient requirement of their growing children. Educated mothers are able to provide children nutrient requirements as a result of their access to well-paying job through education, which increase their income as well as the household income. This result confirms the findings of Wachs *et al.* (2005), which found that mothers' education determines to a large extent the nutritional status of children in given population.

CONCLUSION

It can therefore be concluded from this study that mother's education is a major factor influencing the nutritional status of children in the area. The study therefore recommends that government as well as other agencies should pursue policies that will promote the education of the girl-child in Kwara State, Nigeria. Also, basic infrastructural facilities should be provided to improve the health status of the rural populace, majority of which are farming households. This will in turn boost productivity as well as national development.

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Table 1: Socioeconomic characteristics of Respondents in the study area

Characteristics	Minimum	Maximum	Mean	Standard deviation
Age of children (months)	24	60	40.97	8.649
Educational level of household Heads (years)	0	16	6.53	4.027
Educational level of mothers (years)	0	9	3.28	2.713
Household size	3	11	5.17	1.279
Value of Household assets (₦)	8100	424280	71700	51640.726
Total Household income (₦)	1166.19	142200	29447	25142.730
Household calorie intake (Kcal/AE/day)	1302.40	4211.90	2329.00	711.269

Source: Survey data, 2006

Table 2: Anthropometric Statistics of children in the study area

Characteristics	Minimum	Maximum	Mean	Standard deviation
Weight for age (Z-score)	-3.53	2.98	-0.59	1.41
Weight for Height (Z-score)	-6.04	3.25	-0.99	1.88
Height for Age (Z-score)	-4.53	6.84	0.46	2.65
Child MUAC	9.30	15.60	12.90	1.45

Source:Survey data, 2006

Table 3: Determinants of malnutrition using Logit Regression model in the study area

Variables	Wasting	Underweight	Stunting
Sex of child	0.660	-1.386**	-1.302**
	(1.107)	(-2.361)	(-2.372)
Age of Child	0.006	0.006	0.167***
	(0.171)	(0.188)	(3.976)
Mother's education	0.090	-0.076	0.118
	(0.796)	(-0.667)	(1.192)
Household head's education	0.161	0.140	0.007
	(1.505)	(1.359)	(7.865E-3)
Household's calorie intake	0.001	0.000	0.001
	(1.000)	(0.000)	(1.000)
Household size	-0.063	-0.174	0.219
	(-0.209)	(-0.626)	(1.028)
Access to sanitary toilets	-0.958	-2.507***	0.067
	(-1.563)	(-3.899)	(0.123)
Access to clean water	-0.317	-0.743	-1.440*
	(-0.374)	(-0.879)	(-1.851)
Constant	-2.858	1.045	-11.817
	(-0.947)	(0.390)	(-3.890)
Log likelihood	**89.704**	**96.908**	**108.494**
Chi-square	**13.953**	**37.078**	**30.364**

Sample size	**127**	**127**	**127**

Source: Survey data, 2006
Note:
*indicates significance at 10%
** indicates significance at 5%
*** indicates significance at 1%

Table 4: Determinants of malnutrition using Cobb-Douglas Function in the study area

Variables	**Height for age (Z-scores)**	**Weight for age (Z-scores)**	**Weight for height (Z-scores)**
Sex of child	-0.089	-0.034	-0.069
	(-1.356)	(-0.460)	(-0.927)
Age of Child	0.165	-0.830*	0.389
	(0.398)	(-1.763)	(0.825)
Mother's education	0.012	-0.140	0.064***
	(0.940)	(-0.941)	(4.379)
Household head's education	-0.015	0.022	-0.003
	(-1.259)	(1.638)	(-0.214)
Household's calorie intake	0.442	-0.324	0.357
	(1.134)	(-0.734)	(0.805)
Household size	-0.740*	-0.199	-0.398
	(-1.833)	(-0.434)	(-0.869)
Access to sanitary toilets	0.119*	-0.321***	-0.106
	(1.685)	(-4.011)	(0.123)
Access to clean water	-0.066	0.022	-0.099
	(-0.639)	(0.188)	(-0.850)
Total household income	-0.059	-0.271*	-0.035
	(-0.472)	(-1.908)	(-0.249)
Constant	-1.090	4.215	-1.931
	(-0.716)	(2.442)	(-1.117)
R^2	**0.132**	**0.231**	**0.168**
F	**1.767**	**3.486**	**2.335**
Sample size	**127**	**127**	**127**

Source: Survey data, 2006. *indicates significance at 10%, ** indicates significance at 5%, *** indicates significance at 1%