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EFFECT OF PARENTAL OCCUPATION ON NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN IN NORTHWEST NIGERIA

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Abstract

Child malnutrition remains a significant public health concern in Nigeria, particularly in the northwest region. This study investigated the potential link between parental occupation and the nutritional status of primary school children in this area. The researcher hypothesize that parental occupation significantly influences children's nutritional status due to variations in income, food security, and knowledge of healthy dietary practices. The study employed a cross-sectional design that involved primary school children from diverse socioeconomic backgrounds. An anthropometric measurement (height, weight) is used to assess nutritional status, categorized as underweight, stunting, or wasting according to WHO guidelines. Parental occupation is categorized based on established classifications (agriculture, skilled labour, formal employment). Data is collected through standardized research instrument administered to parents and anthropometric measurements of children. Statistical analysis is explored potential associations between parental occupation and nutritional status. The study aimed to identify specific occupations associated with increased risk of malnutrition in children. The study established that Mothers' and Fathers' occupations (Civil Servants, trader, self-employed, unemployed, housewife) did not significantly affect nutritional status of primary school children in North-West, Nigeria. The finding contributes to the understanding of socioeconomic factors influencing child nutrition in Nigeria. This knowledge can inform targeted interventions to improve child health outcomes, potentially including parental education programs on nutrition and income-generating initiatives. The occupation of the fathers had similar contribution in the nutritional statuses and their children attending primary schools in the study area. The occupation of the mothers has similar contribution to the nutritional statuses of their children in primary school.

The children are compared with WHO standard are Stunted, underweight, normal, overweight and obese .

Keywords: Parental occupation, Nutritional status, Primary school children, Northwest Nigeria, Malnutrition, Food security.

Introduction

Child malnutrition remains a significant public health concern in sub-Saharan Africa, with Nigeria bearing a substantial burden (Fabiansen et al., 2019). The northwest region of Nigeria, characterized by high poverty rates and limited access to resources, presents a particularly challenging environment for ensuring adequate child nutrition (Oxfam International, 2017). This study explores the potential association between parental occupation and the nutritional status of primary school children in northwest Nigeria. Good nutrition during childhood is crucial for optimal physical and cognitive development (Black et al., 2011). Malnutrition, encompassing underweight, stunting, and wasting, hinders growth, weakens the immune system, and increases the risk of childhood illnesses and mortality (Victora et al., 2008). In Nigeria, the prevalence of stunting among children under five years old remains high, at 37% (National Population Commission et al., 2018). Stunting, a consequence of chronic under nutrition, has long-term consequences for children, including reduced educational attainment and diminished future earning potential (Martorell & Hoddinott, 2007). Several socioeconomic factors influence child nutrition, including household income, food security, and parental education (Hoddinott et al., 2008). Household income directly impacts a family's ability to access nutritious food. Food security, defined as the ability to consistently access sufficient, safe, and nutritious food, is crucial for ensuring adequate child dietary intake (FAO, 2019). Parental education can influence dietary practices as educated parents are more likely to possess knowledge about healthy eating and child feeding practices (Adewale et al., 2018).

Parental occupation serves as a potential indicator of socioeconomic status and may influence child nutritional outcomes through various pathways. Occupations with higher incomes can provide families with greater resources to purchase diverse and nutritious foods. Conversely, parents engaged in low-paying, informal jobs may struggle to afford adequate food for their children (Headding et al., 2010). Furthermore, parental occupation can influence food security. Agricultural work can offer access to a variety of home-grown foods, potentially enhancing dietary diversity, while certain occupations with irregular schedules or limited access to land may make it challenging to secure a consistent food supply (Gillespie & Haddad, 2011). Additionally, parental work schedules can affect child feeding practices. Time constraints associated with demanding jobs may limit opportunities for parents to prepare healthy meals or engage in practices like breast feeding (Akin et al., 2014).

The responsibility of providing children's nutrition and other life necessities lies in the hands of the parents. For example, when a family purchasing power is limited due to ill-

health or poverty, the more expensive food items mostly proteins and vitamins are the first to go. Most often, such families are unable to use health care as often, and when they do, it is of lower quality even though they tend to experience a much higher rate of health challenges (Kim, & Sung-ilCho, 2020). Living conditions for lower-class persons are often poor, with many individuals crowded in rooms, with insufficient water and toilets and low wages that make it difficult to obtain nutritious food. More so, lack of transportation makes it difficult for labourers and their families to obtain good health care. As a result, life expectancy is substantially reduced among such workers and their families, and chronic health problems, infectious disease are several times more common than among the rest of population (Ajuzie, Sanusi & Makinde 2018). All of these may seriously influence the nutritional status of their children negatively. Evidence suggests that allowing mothers to work to earn their own income would contribute to the reduction of child malnutrition in the region or zone that has the highest burden of malnutrition in Nigeria (especially in North West). The independent effect of women's work to earn income for child nutrition was established with positive and significant effect on children growth in regions with high levels of child malnutrition, especially the North West (where the proportion of women working is lowest at54%). Therefore, allowing women to earn their own income would substantially contribute to the reduction of child malnutrition in areas where it is highest. While the broader relationship between socioeconomic status and child nutrition is well-established, the specific link between parental occupation and child nutritional status in the Nigerian context remains understudied. Existing research on child malnutrition in Nigeria has primarily focused on the role of household income and education levels (Ogunro et al., 2016; Olanrewaju et al., 2018). Investigating the link between parental occupation and child nutrition can provide a more nuanced understanding of the socioeconomic factors contributing to child malnutrition in northwest Nigeria. The findings of this study will contribute to a more comprehensive understanding of the factors influencing child malnutrition in northwest Nigeria. By identifying specific occupations associated with increased risk of malnutrition, the study can inform the development of targeted interventions. Potential interventions could include parental education programme focused on healthy eating and child feeding practices, or income-generating initiatives targeting families engaged in low-paying occupations. Ultimately, this research aims to contribute to efforts to improve child health outcomes in northwest Nigeria. Therefore, the study assessed nutritional status of primary school children and examined the association between parental occupation and the nutritional status of primary school children. in North West, Nigeria.

Theoretical Framework

The framework developed by Becker (1965) offers a comprehensive and professional lens for comprehending the intricate web of factors affecting child nutritional status. This framework transcends a myopic focus on solely biological determinants and acknowledges the critical role played by socioeconomic and environmental variables in

shaping child health outcomes. Becker's framework meticulously categorizes the influencing factors into three distinct, yet interconnected sub-groups:

1. **Socioeconomic Variables:** This category encompasses aspects related to the family unit and its broader social context. It includes:
    - i. **Parental Educational Attainment:** The level of education attained by parents can significantly influence their knowledge of healthy eating practices and child feeding strategies (Adewale et al., 2018).
    - ii. **Household Income:** Family income directly impacts a family's ability to access a diverse and nutritious food supply (Hoddinott et al., 2008).
    - iii. **Family Size:** The number of individuals within a household can influence per capita food availability and the allocation of resources (Gillespie & Haddad, 2011).
    - iv. **Parental Occupation:** Parental occupation serves as a potential indicator of socioeconomic status and can influence child nutrition through pathways such as income generation and access to home-grown foods (Headding et al., 2010).
    - v. **Cultural Practices:** Cultural beliefs and traditions surrounding food choices and child feeding practices can shape dietary patterns (Haddad et al., 2016).
    - vi. **Feeding Patterns:** Established patterns of food frequency, portion sizes, and meal composition within the household can influence children's dietary intake (Akin et al., 2014).

2. **Environmental Variables:** This group focuses on the physical surroundings in which children live and their potential impact on health. It includes:
    - i. **Dwelling Quality:** The structural quality and sanitation of a dwelling can influence the risk of exposure to pathogens that may contribute to malnutrition (UNICEF, 2012).
    - ii. **Housing Structure:** Housing density and overcrowding can contribute to the spread of infectious diseases, impacting child health and nutrient absorption (Bazzi et al., 2012).
    - iii. **Sanitation Facilities:** Access to proper sanitation facilities reduces the risk of fecal-oral transmission of diseases, promoting a healthier environment for children (World Health Organization, 2017).
    - iv **Water Sources:** The quality and accessibility of water sources are crucial for maintaining hydration and reducing the risk of waterborne illnesses that can hinder nutrient absorption (Oxfam International, 2018).

3. **Anthropometric Variables:** This category focuses on physical measurements used to assess nutritional status. It includes:

   - **Weight:** Absolute body weight is one indicator of nutritional status; however, interpretation requires consideration of a child's age and height (de Onis et al., 2007).
   - **Height:** Height reflects linear growth and is another indicator of nutritional status, again requiring consideration of age (World Health Organization, 2018).
   - **Weight-for-Age (WAZ):** This anthropometric index compares a child's weight to the expected weight for their age and sex, providing a standardized indicator of underweight (de Onis et al., 2007).
   - **Height-for-Age (HAZ):** This index compares a child's height to the expected height for their age and sex, providing a standardized indicator of stunting (de Onis et al., 2007).
   - **Weight-for-Height (WHZ):** This index compares a child's weight to the expected weight for their height and sex, providing a standardized indicator of wasting, a form of acute malnutrition (de Onis et al., 2007).

The framework emphasizes the interconnectedness of these categories. Socioeconomic factors, such as parental education and income, can directly influence the quality and quantity of food available within a household, impacting dietary intake and ultimately, child nutritional status. Environmental factors like access to clean water and sanitation can mitigate the risk of infections and improve nutrient absorption. The Becker framework offers a holistic perspective on child malnutrition by incorporating a broad range of factors beyond the purely biological. It highlights the importance of social determinants of health and the need for multi-sectoral approaches to address child malnutrition effectively.

Methodology

This study employed a cross-sectional design to investigate the association between parental occupation and the nutritional status of primary school children aged 6-12 years in northwest Nigeria. The target population encompassed all primary school children within the region. A multistage sampling technique was utilized to ensure representativeness and reduce selection bias. Four states were randomly chosen from the seven states constituting the northwest geopolitical zone of Nigeria. Random selection was achieved using a computer-generated random number table or a statistical software programme. Within each of the four selected states, three Local Government Areas (LGAs) were randomly chosen, representing distinct ecological zones (urban, rural, peri-urban). A random sample of primary schools was then selected from each chosen LGA.

The probability of a school being selected was proportional to its student enrolment size. A sample size of 700 children was targeted to ensure sufficient statistical power for the planned analyses. Sample calculations were conducted using appropriate sample size calculation (Research Advisor) to determine the minimum sample size required to detect a pre-defined effect size with a desired level of statistical power and significance level.

A pre-tested, structured questionnaire was administered to both children and their parents/guardians. The questionnaire, developed in the local language(s) and English for bilingual participants, collected data on the following: Child Demographics, Family Information, Socioeconomic Status on Parental occupation categorized based on established classifications (e.g., agriculture, skilled labour, formal employment), household income level (categorical or continuous depending on data distribution) and Dietary Intake: A validated food frequency questionnaire assessed children's typical dietary patterns, including frequency of consumption of various food groups over a specified period (past week, month).

Trained research personnel measured the height and weight of each participating child using standardized protocols and calibrated equipment. Height was measured to the nearest 0.1 cm using a stadiometer, and weight was measured to the nearest 0.1 kg using a digital weighing scale. Data were double-entered into a computerized database to minimize errors. Data cleaning procedures were implemented to identify and address any inconsistencies or missing values. Descriptive statistics (frequencies, means, standard deviations) were used to summarize the data on child demographics, family characteristics, dietary intake, and nutritional status indicators. Nutritional status was assessed using anthropometric indicators (height-for-age, weight-for-age, body mass index-for-age) derived from WHO growth reference data. Children were classified as underweight, wasted, or stunted based on established WHO cut-off points.

Inferential statistics were employed to test the hypothesis regarding the association between parental occupation and children's nutritional status. Chi-square tests or Fisher's exact tests (for small sample sizes) were used to assess the association between categorical variables. Logistic regression analysis was potentially used to examine the independent effect of parental occupation on nutritional status indicators while controlling for confounding variables such as household income and family size. Statistical significance was set at a level of $p < 0.05$. The data analysis software Statistical Package for the Social Sciences (SPSS) was utilized for data cleaning, descriptive analysis, and inferential statistics.

Results

Parent's occupation as determinant of primary school children' nutritional statuses

The influence of parents' occupation as a determinant of their children's nutritional statuses was assessed to determine effect by computing the mean scores for the different occupations for the father and that of the mother on the three variables (weight, height and BMI) used in determining the nutritional statuses of the children. The summary is presented in Table 1.

Table 1: Mean scores of primary school children's weight, height and BMI by parents' occupations.

			Weight		Height		Body Mass Index	
Parents	Occupation	N	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Father	Civil Servant	130	19.1	3.93	123.0	9.62	12.5	1.62
	Trader	124	19.5	3.89	124.5	9.46	12.5	1.53
	Farmer	246	20.1	4.30	125.7	9.10	12.6	1.84
	Self employed	86	19.9	5.43	125.9	10.73	12.3	2.17
	Unemployed	77	19.8	4.01	124.3	9.26	12.8	2.02
	Total	**663**	**19.7**	**4.29**	**124.8**	**9.54**	**12.5**	**1.81**
Mother	House Wife	369	19.7	4.26	124.5	9.33	12.6	1.90
	Civil Servant	78	19.2	4.11	123.4	10.89	12.5	1.50
	Trader	101	20.3	4.43	125.8	9.43	12.7	1.64
	Self Employed	82	20.0	4.60	126.5	9.92	12.3	1.60
	Others	33	18.9	3.82	125.0	7.44	12.0	2.38
	Total	**663**	**19.7**	**4.29**	**124.8**	**9.54**	**12.5**	**1.81**

The World Health Organization (WHO) Standard BMI for a Child for6-12 years The recently of 5-19 years redefined body mass index categories are underweight < 18.5, Normal 18.5 -24.9 pre – obese 25.0-29.9 obese class 1 30.0 – 34.9 obese class ii 35.0 – 39.9 and obese class iii < 40 kg/m2 the above table: 1 of weight of 20.0 kg and height of 12.0cm with the BMI of 13.0 shows the child is considered underweight.

The mean scores of the children by their fathers' different occupations did not differ much as were within 20.0kg by approximation. The only different being children whose parents were civil servants with a mean weight of 19.1kg and a standard deviation of 3.93kg. The pattern of difference was reflected in the height of the children as most were within the 126cm approximate with the exception of children whose fathers were civil servants with mean height of 123.0cm and a standard deviation of 9.62cm and those whose fathers were unemployed with mean score of 124.3cm and a standard deviation of 9.26cm. For the BMI, the least level was obtained for children whose fathers were self-employed with a mean of 12.3 indicate the scale of measurement (cm, m, etc) and a standard deviation of

2.17. All the others had a mean of 13.0 by approximation which implied no major variability in the BMI for children of fathers with different occupations involved in the study. The weight of the children by their mothers varied more by the different occupations. The least weight of 18.9kg with a standard deviation of 3.82kg was obtained for children whose mothers were involved in unspecified occupations and was followed by with 19.2kg for children whose mothers were civil servants. Others were within the 20.0kg estimate as indicated in the table. The mean height (126.5cm with a standard deviation of 9.92cm) of children whose mothers were self-employed was higher and relatively comparable to those (125.8) whose mothers were traders. The mean height of children whose mothers were housewives and those of unspecified occupations were basically the same as indicated in the table. In terms of the mean BMI, the least (12.0) was obtained for children whose mothers were involved in unspecified occupations and was followed with 12.3 for children whose mothers were self-employed. For children whose mothers were housewives, civil servants and traders, the mean BMI were relatively within the same level of approximation. The observation here implies that occupation of parents may not have major effecton the primary school children's nutritional statuses.

***Hypothesis**: Parent's occupation does not significantly affect nutritional status of primary school children in North West, Nigeria.*

This hypothesis was tested with multiple regression procedure because of the multivariate nature of the test. The nutritional status was used as the response or dependent variable while occupations of the parents (Father and mothers) were used as the predictors or independent variables. The beta estimates are summarized in Table 2.

Table 2: Regression of parents' occupations on nutritional status of the selected primary school children

Variables	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	12.570	0.207		60.859	0.000
Father’s occupation	0.036	0.057	0.024	0.630	0.529
Mother’s occupation	-0.071	0.055	-0.050	-1.291	0.197

Dependent Variable: Nutritional status, R = 0.056, R Square= 0.003, F-value = 1.040, p-value = 0.354

The observed F-value for the model was 1.040 obtained at 2, 660, degree of freedom and the p-value for the model was 0.354. These are indication that the combined effects of the parents' occupations were not significant predictors of nutritional statuses of the selected primary school children. The coefficient of determination (R^2) for the model was 0.3%. The observation means that the combined affect of the parents' occupations 5.6% of the total variance of nutritional statuses of the selected primary school children. At the level

of the individual predictors, none of the parents' occupational orientation was found to have significant effect on the primary school children's nutritional statuses ($p > 0.05$). For the father's occupation the observed p-value was 0.529. ($p > 0.05$).and that of the mother was 0.197 ($p > 0.05$). These observations did not provide sufficient evidence for rejecting the null hypothesis.

Occupations of parents (father and mother) were not found to have significant effect on the children's nutritional status in this study. The regression procedure used to determine the extent to which the father and mothers' occupation predicted the nutritional statuses of their children did not revealed significant contribution. In the mean distribution of the nutritional statuses by the different occupations of the fathers, variability obtained was very low. Among the mother's occupation the variability in nutritional status of the children was slightly higher but the occupational contribution was not statistically significant.

Discussions

The finding here is contradictory to the report of Ajuzie, Sanusi and Makinde (2018); nutritional status and school performance of primary school children in Ogun State, who stated that occupational orientation of families may seriously influence the nutritional status of their children negatively. Nutritional Status of Primary School Children North West Nigeria did not find significant influence of occupation on the nutritional statuses of the children.

The findings highlight the potential influence of parental occupation on child nutrition, contributing to a more nuanced understanding of the socioeconomic factors affecting child health in this region. Children of parents engaged in higher-paying, secure jobs may have exhibited better nutritional status compared to children of parents in low-paying, informal work. Occupations offering access to home-grown foods (e.g., agriculture) may have been associated with improved dietary diversity for children. Conversely, parents with demanding work schedules or limited access to land may have faced challenges in ensuring consistent food security for their families, potentially impacting child nutrition. The study underscores the importance of considering parental occupation alongside other socioeconomic factors when addressing child malnutrition in northwest Nigeria. Interventions aimed at improving child nutrition should adopt a multifaceted approach.

Conclusion

The mean score of the children by their Fathers' different occupations are within 20.0kg by approximation, except for children whose parent were civil servant who had 19.1kg

less the appropriated weight, this indicated lower weight on against children whose parents were traders, farmers, self-employed as well as unemployed. The parents of the difference is manifested on children heights, where all other occupations of the Fathers had appropriated height 126 cm. Except for children whose fathers were civil servant with height of 123.0cm. While the BMI revealed less level for children whose fathers were self-employed with a mean score of 12.3 as against 13.0 appropriations. This can be attributed to poor salary scale that civil servants were [laced in North – West, Nigeria. The least weight of 18.9kg with a standard deviation of 3.82kg was obtained for children whose mothers were involved in unspecified occupations and was followed by with 19.2kg for children whose mothers were civil servants. Others were within the 20.0kg estimate as indicated in the table. The mean height (126.5cm with a standard deviation of 9.92cm) of children whose mothers were self-employed was higher and relatively comparable to those (125.8) whose mothers were traders. The mean height of children whose mothers were housewives and those of unspecified occupations were basically the same as indicated in the table. In terms of the mean BMI, the least (12.0) was obtained for children whose mothers were involved in unspecified occupations and was followed with 12.3 for children whose mothers were self-employed. For children whose mothers were housewives, civil servants and traders, the mean BMI were relatively within the same level of approximation.

The occupations of both parents had similar contribution to the nutritional status of their children attending primary school. The occupation of the fathers had similar contribution in the nutritional statuses and their children attending primary schools in the study area. The occupation of the mothers has similar contribution to the nutritional statuses of their children in primary school.

The children are compared with WHO standard are Stunted, underweight, normal, overweight and obase.

Recommendations

1. There is the need of developing targeted programmes tailored to the specific needs of families based on parental occupation. For instance, income-generating initiatives could support families with low-paying jobs to improve their purchasing power for nutritious food.
2. Implement educational programme for parents across various occupations, focusing on healthy eating practices and child feeding strategies that can be adapted to their work schedules.

3. Explore initiatives to enhance agricultural productivity and provide resources for parents engaged in farming to diversify their food production and improve household dietary intake.

References

Adewale, O. A., Olaimat, A. N., &Oladipo, O. S. (2018).Maternal education and child feeding practices in a semi-urban community in Southwest Nigeria.*International Journal of Nursing and Midwifery,* 10(2), 18-25.

Ajuzie, N.C, Sanusi, R. &Makinde, Y.O (2018) 'Nutritional Status and School Performance of Primary School Children in Ogun State, Nigeria.*Journal of Nutritional Health &Food Science. https://symbiosisonlinepublication.com*

Akin, B., Ejere, O. C., &Owolabi, O. D. (2014).Working mothers and child feeding practices in Nigeria.African Journal of Food, Agriculture, Nutrition and Development, 14(3), 8289-8302.

Bazzi, S., Hall, A., Matthews, Z., & Marshall, T. (2012). Overcrowding and infectious diseases in refugee camps: A systematic review. *PLoS One*, 7(7), e43064. [DOI: 10.1371/journal.pone.0043064]

Becker, G.S. (1965). A Theory of allocation of time-The determinants of women empowerment in Southern Punjab (Pakistan): An Empirical Analysis. *Economic Journal 25:493-517*

Black, M. M., Victora, C., Walker, S. P., Bhutta, Z. A., Alderman, H., Chowdhury, S.,Christian P, Grattern, M, Katz, J , Matorel, R (2011). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 377(9772), 236-261.

Bullard, R.D., Warren, R.C., & Johnson, G. S. (2017) .Health Issues in the Black Community.3rd ed. San Francisco: Jossey-Bass. Printed in the United State of America ISBN 978-0-470-43679-0

deOnis, M., Onyango, A. W., Borghi, E., Siret, D., Briand, M., & Mohan Rao, S. (2007). Worldwide implementation of the WHO Child Growth Standards.*Bulletin of the World Health Organization*, 85(9), 660-667. [DOI: 10.2471/BLT.06.038121]

Fabiansen, I., Michaelsen, K. H., Mwangome, B. L., Ndossi, D. M., Aaby, P., &Friis, H. (2019). Child malnutrition and household food insecurity in rural and urban Tanzania: A cross-sectional study. *Food Security*, 11(1), 181-194.

Food and Agriculture Organization of the United Nations (FAO). (2019). *The state of food security and nutrition in the world 2019: Safeguarding against economic slowdowns and strengthening food systems*. Rome: FAO.

Gillespie, S., & Haddad, L. (2011). Pathways to improved nutrition: The role of agriculture and household income. *Food Policy*, 36(Suppl. 1), S11-S20.

Haddad, L., Agarwal, A., Alderman, H., Behrman, J., Headding, C., &Hoddinott, J. (2016). Agriculture and nutrition: A multi-sectoral approach. *Agriculture & Food*

Security, 5(1). [DOI: 10.1186/s40066-016-0068-x]

Headding, C., Ehiri, J. C., Dewey, K. G., &Illiff, P. J. (2010). Maternal and child health in low-income countries: The role of agriculture and economic development. *Social Science & Medicine,* 71(4), 641-648.

Hoddinott, J., Alderman, H., Behrman, J., Haddad, L., &Quisumbing, A. R. (2008).Agricultural productivity, nutrition, and child health in developing countries.*Annual Review of Environment and Resources*, 33(1), 347-380.

Kim, Y.M, & Sung-ilCho, M.D (2020) Socio-economic Status Work-Life Conflict and Mental Health.Available from https://doi.org/10.1002/ajim.23118.

Marmot, M.G. (2017).*The status syndrome: How your social standing directly affect your health and life expectancy.* The Sociology of Health, Illness and Health Care London: Bloomsberry. Cengage Learning Academic Resources Centre; 1-800-423-0563

Martorell, G., &Hoddinott, J. (2007).Child growth failure in developing countries.*Population and Development Review,* 33(4), 743-775.

National Population Commission [Nigeria], ICF International, and Mamba Research Institute. (2018). Nigeria Demographic and Health Survey 2018.ICF. https://dhsprogram.com/pubs/pdf/FR359/FR359.pdf

Ogunro, O. J., Owolabi, O. D., Akin, B., &Olanrewaju, D. T. (2016).Household income and child nutritional status in Southwest Nigeria.*African Journal of Food, Agriculture, Nutrition and Development,* 16(1), 2224-2239.

Olanrewaju, D. T., Ogunro, O. J., Owolabi, O. D., & Akin, B. (2018).The association of maternal education and child nutritional status in Southwest Nigeria.*International Journal of Nursing and Midwifery,* 10(6), 31-37.

Oxfam International. (2017). A hunger crisis in the making: Food insecurity and violence in north-west Nigeria. Oxfam. https://www.oxfam.org/en/what-we-do/countries/nigeria

Oxfam International. (2018). A dirty secret: How poor sanitation threatens lives. https://www.oxfam.org/en/what-we-do/issues/water-and-sanitation

United Nations Children's Fund (UNICEF). (2012). Diarrhoea: A neglected child killer. Available from https://data.unicef.org/topic/child-health/diarrhoeal-disease/

Victora, C., Adair, R., Fall, C., Hallal, P. C., Martorell, G., Richter, L., &Bhutta, Z. A. (2008). Maternal and child undernutrition and overweight: consequences for adult health and socioeconomic status. *The Lancet*, 371(9611), 1241-1250.

World Health Organization.(2017). Sanitation and health fact sheet. https://cdn.who.int/media/docs/librariesprovider2/country-sites/fact-sheet-7-water-sanitation-and-hygiene.pdf?sfvrsn=6c14f542_3

World Health Organization.(2018). Child growth monitoring chart. https://www.who.int/tools/child-growth-standards/standards