NUTRITIONAL STATUS OF UNDER FIVE CHILDREN OF LOW INCOME HOUSEHOLDS IN NASARAWA STATE

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Abstract: Malnutrition, and in particular protein-energy malnutrition in young and growing children have become one of the serious health problems in Nigeria. Malnutrition is regarded as a complex outcome with multiple causation which can have adverse effects on the physical and mental development of the growing children. Children constitute the most nutritionally vulnerable group in any community and as such, the overriding interest of this study was to appraise the nutritional status of under five children of low income earners in Nigeria with focus on Nasarawa State case. This study utilized descriptive research design and logistics regression method of analysis in carrying out the empirical analysis. The finding revealed that income level of parents 1.22 had no significant effect on nutritional status of under - five children in Nasarawa State. The implication of this result is that, large family size associated with low income levels have been responsible for lack of care and attention for under five children. Most people in staying in rural areas live together income location with extended families, relations and clans which tend to have adverse effects on nutritional status of their under-five children. The findings have demonstrated that educational attainment of male and female parents had no significant effect on nutritional status of under-five children which is 1.878 in Nasarawa State; and hence the low level of education of most parents has not helped to improve the nutritional status of their under-five children. Based on the findings, the study thus recommends that there is the need government to formulate policies that will address the health and nutritional needs of under five children in Nigeria. The health ministry should collaborate with Ministry of Education, Ministry of women affairs and other relevant stakeholders to advocate for girl child education and women education, which will facilitate knowledge and skills in preparing the required calorie needs of the child and the family.

Keywords: Nutritional status, under-five children, low income earners, educational level

Introduction

Over the years, child health problems have been identified to constitute the greatest threat to public health in the world amidst beliefs. The world is filled with believers in the importance of good care and attention for children especially during their early childhood (FAO/WHO, 1992; WHO, 2000). Thus, nutrition has been identified to be fundamental to the pillar of human life, health and development across the entire life span. From the earliest stages of foetal development, at birth, through infancy, childhood, adolescence, and into adulthood and old age, proper food and good nutrition are essential for survival, physical growth, mental development, performance, productivity, health and well-being (FAO/WHO, 1992; WHO, 2000).

Malnutrition, and in particular protein-energy deficiency in young and growing children have become one of the serious health problems in Nigeria (Shetty and James, 1994). Malnutrition is regarded as a complex outcome with multiple causation. It can have adverse effects on the physical and mental development of growing children. Moreover, since growth disorder in human being sometimes result from poor nutrition and other environmental upsets, growth surveys and empirical growth indicators would prove quite essential particularly in monitoring the nutritional outcomes and status of young children in any community (UNICEF and FGN, 2016).

Growth assessment has been identified as the most important measure for evaluating the health and nutritional status of Under-5 children through anthropometric measurements (Apley, 1979). The reason for this is that anthropometric indicators of growth not only provide information on health and nutritional status, but is also an indirect measure of the quality of life of an entire population (Shetty and James, 1994).

Malnutrition is a pathological condition brought about by the inadequacy or over consumption of one or more of the essential nutrients necessary for survival, growth, reproduction as well as productivity at work (UNICEF and FGN, 2016). The inadequate or excessive intake of nutrients may result from disease factors that affect digestion, absorption, transport, and utilization of nutrients (UNICEF, 2010). Malabsorption of nutrients may result from genetic cum environmental conditions or illness. The most critically vulnerable groups are the developing foetus, preschool children, women before and during pregnancy, and lactating women (UNICEF, 2008). Malnutrition affects all levels of development physically, mentally, socially, psychologically and physiologically. It thus multiplies the effect of prevailing disease or mortality in children and infants (Huffman and Marlin, 1994).

In the developing economies, malnutrition usually makes its greatest impact on preschoolers. Under-5 children mortality accounts for nearly 50% of total deaths, and careful examination has revealed malnutrition as the major underlying factor (Whitehead and Rowland, 2002). Their findings further revealed that it is during the preschool years that under-nutrition in the form of kwashiorkor and marasmus are most prevalent. This is because these children are in the state of life when growth is rapid, nutrient requirements are high and the diets with appropriate calorie mix inadequate. Equally, there is continuous stress from bacterial, viral and parasitic infections which contribute to malnutrition. The presence of malnutrition reduces the resistance of the child to infections and infectious diseases, resulting in reduced food intake and poor nutrient absorption, which in turn result in stunted growth depending on the severity of the malnutrition.

Children below 5 years of age have been specifically studied because their health status is a sensitive indicator of overall community health, particularly among the disadvantaged group in the population. The preschoolers especially those at the second year of life are 'transitional' as regards diet, immunity to infections and psychological dependency (Pyke, 1979). This period which is characterized by a high nutrient need, particularly that of protein for swiftly developing the muscle tissue, is also a period when several meals with

required calorie mix a day are required and when food should be easily masticable and digestible.

Evidence has shown that 4% of the total children born in developing countries die of malnutrition before they are five years old (Toriola, 1990); and that the most affected are usually the children of non literate parents with low socio-economic brackets that have low purchasing power in the economy (Adekunle, 2005). Quite a number of studies have shown that poor feeding and or recurrent infections as a result of poverty leads to stunted growth and delayed mental development. It has also been shown that physical growth and cognitive development in children are faster during early years of life and that by the age of four years, 50% of the adult intellectual capacity has been attained and before thirteen years, 92% of adult intellectual capacity is attained (Braveman & Gruskin, 2003; Liu *et al*., 2003).

Childhood undernutrition remains a public health problem in Nigeria as the status did not improve substantially during the last two decades. The implications of this unrelenting situation for the wellbeing of children and the development of the nation as a whole are unacceptable because undernutrition contributes to the high rates of morbidity, disability and mortality among children (WHO, 2000). In addition, undernutrition constrains people's ability to fulfil their potential as it is also associated with impaired growth, mental development and school performance, reduced adult size and reduced work capacity, which in turn impacts on economic productivity at the national level (Hart and Atinmo, 2003). According to Okolie (2005), most children in Nigeria fall sick as a result of eating inappropriate food for a long period of time. This situation, most often, leads to prolonged deficiency of appropriate vitamins, minerals and proteins which could cause some serious health problems. Balch and Balch (2000) posited that too many of us do not have the slightest idea of how to maintain good health. Many children suffer from diseases that could have otherwise been prevented by eating good and appropriate food.

The rural children (who are also mostly children of younger/less educated mothers) are definitely disadvantaged in terms of nutritional status. Children living in rural areas are, on the average, twice as likely to be deprived of essential goods and services as their urban peers. The sad fact is that disadvantages overlap and reinforce one another.

Indeed, children constitute the most nutritionally vulnerable group in any community and this calls for appraising the nutritional status of under five children of low income earners in Nigeria, with focus in Nasarawa state. To unearth this, the study posed the following research questions:

i. To what extent has income level of parents affected the nutritional status of under five children in Nasarawa state?
ii. What effects do household size have on the nutritional status of under five children in Nasarawa state?
iii. To what extent has educational attainment of female parents affected the nutritional status of under five children in Nasarawa state?

Based on the research questions raised, the following hypothesis are posed to validate the data for the analysis of the findings of this study.

H01: Income level of parents has no significant effect on nutritional status of under five children in Nasarawa state

H02: Household sizes have no significant impact on nutritional status of under five children in Nasarawa state

H03: Educational attainment of male and female parents has no significant effect on nutritional status of under five children in Nasarawa state

Besides introduction, there are aspects of literature review, methodology, sections four is the results and discussion of results, while in section five, conclusions were drawn and policy recommendations that the study covers.

Nutrition conceptual issues

There are array of conceptual and theoretical issues that this study hopes to address. They are stated and reviewed forthwith:

Nutrition involves the processes used by the adult or child to take in food and to digest, absorb, transport, utilize and excrete food substances (Endres, 1980). The components or substances found in foods are called nutrients. Food is essential for life; as what children and adults eat affects their nutritional status as well as their health. Food supplies are essential nutrients that the body requires for energy; growth and development; resistance to illness and infection and tissue repair.

Lynn (1989) noted that a daily intake of essential nutrients depends on eating a variety of foods in the required quantity and quality. However, the availability of food is often determined by one's environment, that is, the availability of money, geographic location, cultural preferences and consumer knowledge of good nutrition. Good nutrition according to WHO (1988), simply means having a nutritional status that enables us to grow well and enjoy good health. Nutritional balance is something that is built up day by day right from the very first minute of life or from the point where the embryo starts to form in the mother's womb.

Ekpo (1982) posited that nutrition is influenced by such factors as culture, economy, education, and religion. He noted that the cultural food pattern of any community depends on two factors; namely (a) The success of its agricultural system measured by the extent to which it has provided full and balanced diet for physical fitness and greater productivity and (b) Marketable products for exchange economy. This is of great concern to Nigeria where available medical evidence points to widespread incidence of poor protein intake that facilitate – calorie malnutrition. Ekpo attributed the nutritional problems of rural communities to both ignorance in the choice of foods and individual poverty in wage earning.

Child nutritional status

In judging the nutritional status of a child, Lynn (1989) believes that there are many factors to look for. Besides a steady gain in height and weight in conformity with individual patterns, there should be good bone and tooth development, good posture, shiny hair, firm muscle turgor, clear skin and eyes, plus alertness and curiosity – all indications of good health and proper nutrition. Nutritional status affects children's behavior. Well-nourished children are more alert and attentive and are better able to benefit from physical activity and learning experiences (Lynn 1989). Poorly-nourished children may be quiet and withdrawn, or hyperactive and disruptive during class activities. Guthrie (1986) opined that children's resistance to infection and illness is also definitely influenced by their nutritional status. Children who are well-nourished are less likely to become ill; they also recover more quickly when they are sick as Poorly-nourished children are more susceptible to infections and illnesses. Weiser (1982) posited that there are a few basic facts about food and nutrition that every provider of child care must know and put into practice. These include information about the essential nutrients and recommended meal patterns and practices for very young children. The total nutrient needs of very young children are relatively low, but for children from 1 to 3 years of age, the requirements for protein, calories, a number of minerals and vitamins A, B, and F are about half dose of adults, while calcium and vitamin C needs are about the same.

Onyezili (2005) findings revealed that energy balance could be attained either by eating as much as is needed, or by reducing activity to the level of intake affordable, with no pathological manifestations but without the satisfaction of need. Yet, the satisfaction of needs at desired activity levels is, as is well known now, critical for early childhood psychosocial development. Similarly, it has been demonstrated that socio-economic factors are more significant causes of poor growth than ethnic or geographical differences.

Poverty and malnutrition

According to Salau (2008) poverty and malnutrition in Nigeria are widespread and severe, and therefore continue to be at the center stage of the development discourse. Sixty-four percent of all rural Nigeria have a consumption level below the basic-needs poverty line, while 43 percent of rural children under five years of age are stunted in growth. Thus, many rural Nigerian women live under conditions of extreme vulnerability, both economically and physically, with limited abilities to cope with shocks and safeguard their current level of consumption and well-being. This affects their children's nutritional practices. Also, according to Appoh and Krekling (2005), the amount of money a woman has will determine the type of weaning food that she will introduce to her child. Most often, women lack financial control over household resources which increase inability to give their children the kind of food they need.

Maternal Education and Nutrition: Women's education is recognized by all the major international development agencies as crucial for developing countries in terms of providing food nutrition to the family. For example, the UNICEF report State of the World's Children 2004 advocated for the vital importance of improving girl's education as it benefits both boys and girls, helps lower infant and child mortality, improves nutrition and health, raises economic productivity and reduces poverty around the world (UNICEF, 2004). Apart from being an important end in itself, education is viewed as a key element in the overall strategy for reducing poverty and malnutrition in the developing world (OXFAM, 2001). Mother's education is closely linked to child nutritional practices. According to Mishra and Retherford (2000) maternal education is a strong determinant of child nutritional status. Women with secondary education and above were found to have better knowledge of child nutritional status than their counterparts with lower educational level. They also found that women's knowledge of health and nutrition, including their perceptions of child growth and ability to detect growth faltering, are important determinants of children's nutrition practices.

Theoretical Framework

This study framework provided a framework of relevant theories that the findings of this study will be founded on.

Behavioral Counselling Theory: Several scholars are involved in behavioural counseling, and they include Ivan Pavlov, John B. Watson, Edward, L., Thorndike, Edward C. Tolman, Clark, L. etc. However, the name that is best known to the general public, as well as most controversial, is Skinner (Thomson, 1992). B.F. Skinner, though, he did not develop new principles of behaviourism, did the most to translate the theories and ideas of other behaviorists into applied and useful technology. Behavioural counseling according to Thomson (1992) is a re-education or relearning process. Adaptive or helpful behavior is reinforced, while maladaptive or unhelpful behaviour is extinguished. A broad statement of the behaviorist view of the nature of people is probably best summarized by Skinner's (1971) belief that children are influenced and changed as biological entities by the things that happen to them. He posited the idea that the child of the past is still contained within us was a form of animism that served no useful purpose in explaining present behaviour. Behaviourists contend that people can make only those responses they have learned, and they make them when the stimulus conditions are appropriate. Individuals then are viewed by behavioural counselors as products of their conditioning. The stimulus response paradigm is the basic pattern of all human learning. People react in predictable ways to any given stimulus according to what they have learned through experience.

Skinner (1971) believed that a person is a member of a specie shaped by evolutionary contingencies of survival, displaying behavioural processes which bring him under the control of the environment in which he lives, and largely under the control of a social environment which he and millions of others like him have constructed and maintained during the evolution of a culture. Since human behaviour is learned, any or all behaviors can be unlearned and new behaviours learned in its place. As with most counseling especially in this study, the ultimate goal of behavioural counseling is teaching mothers how to become their own counselors for changing their behavior to better meet their needs. The emerging knowledge and practice of behavioral counseling are relevant to casework simply because social workers are also intimately involved in the business of modifying behaviours. It has been noted in Ebrahim (1990) that the under-five clinic is an ideal place for the counseling of mothers in methods of childcare and in the improvement of feeding habits. Counseling may be provided where mothers assemble in groups. These mothers need individual health counseling, that is, each of them is counseled separately about her own social problem.

The Health Belief Theory: A group of social psychologists developed the Health Belief Model (HBM) in the early 1950s in an attempt to understand the widespread failure of people to accept disease prevention or early response to disease (Rosenstock, 1974). The basic components of the health belief model are derived from a well-established body of psychological and behavioural theory whose various models hypothesized that behaviour depends mainly upon two variables, namely, the value placed by an individual on a particular goal; and the individual's estimate of the likelihood that a given action will achieve that goal (Maimman and Becker, 1974). When these variables were conceptualized in the context of health-related behaviour, the correspondences were (1) The desire to avoid illness and (2) the belief that a specific health action will prevent or ameliorate illness; that is the individual's estimate of the threat of illness and of the likelihood of being able, through personal action, to reduce that threat. Rosenstock (1974) noted that the combined levels of susceptibility and the severity provided the energy or force to act and the perception of benefits or less barriers provided a preferred path of action. However, it was felt that some stimulus was necessary to trigger the decision-making process. According to Rosenstock (1974), this is called "Cue to action" and might be internal or external for example health education and campaigns from the mass media communications.

Empirical analysis of nutritional outcomes in under five children involves the examination of individual children's physical condition, growth and development, behaviour, the urinary, blood and tissue levels of essential and other trace elements (or nutrients), and the quality and quantity of nutrients intake.

Mavis (1981) findings revealed that Malnutrition tends to occur primarily in poor families as a result of the adverse socio-economic and environmental conditions typically associated with poverty, including poor housing and sanitation, exposure to infectious and parasitic diseases, inadequate health care, large family size, very limited

educational and occupational opportunities, poor feeding and child care practices.

However, Scrimshaw (1997) observed that one of the most obvious clinical manifestations of serious malnutrition in infancy is a dramatic combination of apathy and irritability. The infant is grossly unresponsive to his surroundings and obviously unable to profit from the objective opportunities for experience present in his surroundings.

In Nigeria, findings from a nutrition survey, conducted by the government of Nigeria and the United Nations Children's Fund (UNICEF) in 1993 revealed that Kano State, in the northern savannah zone of the country faced worsening food insecurity. It had the highest prevalence in the country of stunting or chronic under-nutrition among children under the age of five and alarming figures for micronutrient deficiencies of vitamin A and iodine in children. This led to the high incidence of malnutrition related diseases including marasmus, kwashiorkor and goiter (FAO and UNDP, 2001). The major underlying causes of nutritional problems include poor maternal and child care practices, lack of awareness and education, family food insecurity, poor intra family food distribution, poor access to good quality health and sanitation services (World Bank, 2012). Nutrition problems are due to lack of education and proper utilization of food rather than lack of food. Rokx and Brown, (2002) observed that lack of knowledge about healthy nutrition behaviours and practices have been a major cause of poor nutrition in most of the developing world.

Findings from a research carried by World Bank (2012) revealed that in Africa, where malnutrition is high, inadequate feeding of young children preceded economic hardship. Poor nutrition has been equally caused by nonexclusive breastfeeding, the early introduction of foods other than breast milk, and inadequate amounts of complementary foods starting at about six months. Most of these are related to poor child care practices. Because resources to buy adequate quantities of high quality foods have declined in some families, feeding practices have deteriorated further.

According to the findings of Burgess and Grace (1998), poor nutrition has prevented children and communities from reaching their full potential and from participating fully in social and economic life. Even worse, under-nutrition affects not just one generation as under nourished parents bear undernourished children. This has implications for the continued well-being of communities.

Onyeneho (2005) findings posited that Nigeria, like many sub-Sahara African Countries, it had witnessed a dramatic increase in mortality rate amongst infants and children, contrary to the decline experienced in the mid-1980s. WHO/UNICEF (2003) estimated that the child mortality rate for Nigeria is 183/1000. This was high compared with those of countries of other world regions then such as Asia, Latin America and Europe.

According to the findings of Obionu (2001), childhood mortality death before age five accounts for approximately forty percent or more of the total mortality rate in most developing countries. Infant mortality rate (IMR), which is a measure of death within the first years of birth, ranges from 50 to 150 per thousand which is up to 10 times greater than that of industrialized countries. Data from the Multiple Indicator Cluster Survey (MICS), a survey carried out nationwide by the National Bureau of Statistics (NBS) in 1999, indicated that almost one in five Nigerian children died before reaching the age of five (NBS, 2000). This implies, that on average, a baby born in Nigeria is about 30 times more at risk of death before the age of five than a baby born in the industrialized countries.

Atkins (2002) findings revealed that malnutrition remained one of the major contributing factors to disease and death in the world, while its impact is greatest in poor and underdeveloped parts of the world, where protein energy malnutrition accounts for 49% of deaths in children under the age of 5 years. Lack of access at all times to a sufficient quantity and quality of safe and nutritious food for an active and healthy life can cause under-nutrition and micronutrient deficiencies, which affect every age group throughout the developing world (FAO and UNDP, 2001). Increased awareness of the path physiological processes associated with malnutrition can guide therapies to reduce the associated morbidity and mortality, but improved access to food-providing a balanced combination of energy and nutrients continued to be the key to prevention of malnutrition (Ravelli 1998).

Methodological Framework

A cross-sectional survey design, which aimed at collecting information on certain variables in the study population at one point in time, was used in this research. A sample survey was adopted where a proportion of the population was studied and the selection was made such that the sample was a purposive representative sample of the whole population. A sample survey was also adopted because any reports from any good sample can be generalizable.

The population of the study comprised of people living within the rural areas of Keffi, Akwanga and Nasarawa LGA of Nasarawa state. A purposive population size is estimated to be about 3830 people. However, a random sample of 126 respondents were used in carrying out the survey and analysis. Data collection was carried out with a pretested structured questionnaire scaled in a Yes or No responses. The data obtained from the questionnaires were analysed using Statistical Package for Social Sciences (SPSS) version 24.

Equally, descriptive and quantitative data analysis were carried out in the study. Descriptive analytical tools such as frequency tables and percentages were used to describe the households' socio-demographic characteristics. These tools were, employed to present indices of nutritional status of under five children and low-income earners as well as to avail information on some basic environmental situation and sanitary status of the target households in the study area.

Logistic model was employed in carrying out the empirical analysis. The logistic regression analysis helped to determine the changes in the long odds of the nutritional status of under-five children as a result of the changes in the income earnings. Logistic regression was also employed to further test the simultaneous effect of factor independent variables.

The logistic regression Model is stated thus:

$$L_i = In\left(\frac{P_i}{1-P_i}\right) = \beta_1 + \beta_2 X_i$$

Where;

L is the logit.

ln is the natural log

X is the income earnings

Pi, the probability of improved nutritional status of under-five children occurring given as $1(1-P_i)$, the probability of nutritional status of under-five children not occurring given as 0. As *P* goes from 0 to 1 that is, as *X* varies from $-\infty$ to $+\infty$, the logit *L*goes from $-\infty$ to $+\infty$. That is, although the probabilities of nutritional status of under-five children lie between 0 and 1, the logits are not so bounded. If *L*, the logit, is positive, it means that when the value of the income earners increases, the odds that the nutritional status of under-five children equals 1, implying that some event of interest occurs and increases. If L is negative, the odds that the nutritional status of under-five children equals 1 and decreases as the value of low income earnings increases.

Results and Discussion

The data is presented and analyzed as availed herewith. From Table 1, it is observed that most of the respondents do not always have enough money to buy the required food they are in need. This was reflected by 64 percent of the entire people who affirmed to this, while 37 percent responded that they have enough money to buy food they desire. More so, it is revealed that due to lack of money, most of them (97 percent) do skip meals to remain alive. Most of the respondents (61 percent), do not buy the type of food they desire even with the little money they seem to have.

Table 1: Responses on Household Access to Income and Consumption Patterns

Item	Yes		No	
	Freq	%	Freq	%
Do you always have enough money to buy food	46	37	80	64
Do you skip meals?	122	97	4	3.2
Do you buy the type of food you desire	49	39	77	61
Do you have enough food you require	59	47	67	53
Whenever the food in the house finishes, do you always have enough money to buy more	47	37	79	63

Source: Field Survey, 2021

With respect to infant feeding practices (Table 2), it is observed that most of the respondents (56 percent) do not practice exclusive breastfeeding, and that is apparently due to lack of nutritional food need and awareness by the nursing mother. And as such, most of them (86 percent) use locally available foods for complementary feeding. The respondents apparently due to parental love still feed your children on demand and this may not necessarily be healthy food with required nutrients. Most of them (69 percent) even while they are sick, still feed their children as reflected in the responses thus far.

Table 2: Opinions on infant feeding practices

Item	Yes		No	
	Freq	%	Freq	%
Did you practice exclusive breast feeding?	55	44	71	56
Did you use locally available foods for complementary feeding?	108	86	18	14
Did you and still feed your child on demand?	102	81	24	19
Did you continue feeding your child during illness?	87	69	39	31

Source: Field Survey, 2021

Indeed, with respect to Nutritional status of Under five children of these low-income earners, it is glaring that due to inadequate incomes, 35 percent of the respondents have not been able to take their child to health institutions in the last five years. They have no access to safe water and some other conveniences as revealed by 60 percent of respondents. There have been several incidences of epidemic in the area; and this has resulted to poor living conditions of children living in the area as 55 percent respondents attested in this favour (Table 3). More so, 59 percent of the respondents were of the view that the size of the family is on the increase despite the economic condition as demonstrated in the data presented.

Table 3: Nutritional status of under-five children of low income earners

Item	SA	A	D	SD	U
You have taken your child to health institutions in the last five years in the study area	19	14	30	35	1.6
Access to safe water and some other conveniences are available for people living in your area	9.5	14	60	14	1.6
The age of the child determines whether or not the child would go to primary school or not	6.3	59	14	19	1.6
There has been incidence of epidemic in the area	25	30	10	22	11.9
The living condition in your area has negative influence on your child nutrition	60	19	14	6.3	1.6
The size of the family is on the increase despite the economic condition	23	59	9.5	5.6	3.2
Either parent has obtained some level of education	11	9.5	19	54	6.3

Source: Field Survey, 2021

Test of Hypothesis

The three null hypotheses formulated in this study were tested using z- statistics obtained from the Probit model. The Probability Value (PV) was used to determine the level of significance of the relationship. If the PV is < 0.05, it implies that the regressor in question is statistically significant at 5% level; otherwise, it is not significant at that level.

Hypothesis One

H01: Income level of parents has no significant effect on nutritional status of under five children in Nasarawa state

Table 4: Logistic regression result on income level of parents and nutritional status of under five children in Nasarawa state

Tobit Regression				**Number of Obs**	=	**126**
				LR chi^2(1)	=	**121.46**
				Prob> chi^2	=	**0.0000**
Log Likelihood	**=-46.113727**			**Pseudo R^2**	=	**0.6793**
Nutritional status of under five children	Coef.	Std. Err.	z	p>|z|	[95% Conf.	Interval]
Income level of parents	3.8556	3.1593	1.2204	0.8442	3.1245	3.9857
_cons	2.2246	1.4106	2.1236	0.0013	1.2544	2.4244
/Sigma	0.4522	0.4444			0.3965	0.5411

15 left-censored observations at forensicme~s<= 1; 111 uncensored observations; 0 right-censored observations

Source: Field Survey & Authors Computation using STATA 14

From the logistic regression result in Table 3, it is observed that the calculated z-value for income level of parents is 1.22 whilst the tabulated value is 1.96. Since the z-calculated is less than the z-tabulated (1.22< 1.96) it thus falls in the acceptance region and hence, we accept the first null hypothesis **($H0_1$)**. Conclude that income level of parents had no significant effect on nutritional status of under five children in Nasarawa state.

Hypothesis Two

H02: Household size has no significant impact on nutritional status of under five children in Nasarawa state

Table 5: Logistic Regression Result on Household size and nutritional status of under five children in Nasarawa state

Tobit Regression				Number of Obs	=	126
				LR $chi^2(1)$	=	124.46
				Prob> chi^2	=	0.0000
Log Likelihood	=-33.5464			Pseudo R^2	=	0.7936
Nutritional status of under five children	Coef.	Std. Err.	z	p>|z|	[95% Conf.	Interval]
Household size	3.2085	3.2871	0.9761	0.2544	3.1689	4.8542
_cons	3.1130	1.1461	2.7161	0.0000	3.0124	3.2655
/Sigma	0.2122	0.2146			0.3125	0.5174

24 left-censored observations at forensicme~s<= 1; 102 uncensored observations; 0 right-censored observations

Source: Field Survey & Authors Computation using STATA 14

Table 6: Logistic Regression Result on Educational attainment and nutritional status of under five children in Nasarawa state

Tobit Regression				Number of Obs	=	126
				LR $chi^2(1)$	=	115.52
				Prob> chi^2	=	0.0022
Log Likelihood	=-49.8289			Pseudo R^2	=	0.7255
Nutritional status of under five children	Coef.	Std. Err.	z	p>|z|	[95% Conf.	Interval]
Educational attainment male and female parents	4.1916	2.2315	1.8783	0.7451	4.1254	4.2541
_cons	11.1258	2.2230	5.2113	0.0000	10.1214	11.5425
/Sigma	0.2118	0.1454			0.1115	0.2254

26 left-censored observations at forensicme~s<= 1; 100 uncensored observations; 0 right-censored observations

Source: Field Survey & Authors Computation using STATA 14

From the logistic regression result in Table 5, the calculated z-value for Household size is 0.9761 and the critical value is 1.96 under 95% confidence level. Since the z-calculated is less than the critical value (0.976 < 1.96) it also falls in the acceptance region and hence, we accept the second null hypothesis **($H0_2$)** that household size had no significant impact on nutritional status of under five children in Nasarawa state.

H03: Educational attainment of male and female parents have had no significant effect on nutritional status of under five children in Nasarawa state

The calculated z-value for educational attainment of male and female parent was found to be 1.878 and by rule of thumb, the tabulated value is ±1.96 under 95% confidence interval levels. The calculated z-value for Educational attainment of male and female parents is less than the tabulated value that is; 1.87 < 1.96, we thus accept the null hypotheses ($H0_3$) and infer that educational attainment of male and female parents had no significant effect on nutritional status of under five children in Nasarawa state.

From the findings thus far, it is glaring that income levels of parents have had no significant effect on nutritional status of under five children in Nasarawa state. This affirms the research findings by World Bank (2012) that in Africa, where malnutrition is high, inadequate feeding of young children preceded economic hardship. Poor nutrition is also caused by nonexclusive breastfeeding, the early introduction of foods other than breast milk, and inadequate amounts of complementary foods starting at about six months during post-natal care. Most of these are related to poor child care practices. Because resources to buy adequate quantities of high quality foods have declined in some families, feeding practices have deteriorated further.

Furthermore, our findings revealed that household size had no significant impact on nutritional status of under five children in Nasarawa state. The implication of this result is that large family size associated with low income levels have been responsible for lack of care and attention given for under five children. Most people staying in rural areas live together in one location with their extended families, relations and clans which tend to have adverse effect on nutritional status of their under five children. This is in line with the results provided by Mavis (1981), that malnutrition tends to occur primarily in poor families as a result of the adverse socio-economic and environmental conditions typically associated with poverty prevalence in large family size, including poor housing and sanitation, exposure to infectious and parasitic diseases, inadequate health care, very limited educational and occupational opportunities, poor feeding and child care practices.

Indeed, the findings have clearly demonstrated that educational attainment of male and female parents had no significant effect on nutritional status of under-five children in Nasarawa state, because the low level of education of most parents has not helped to improve the nutritional status of their kindergartens. As rightly observed by World Bank (2016), the major underlying causes of nutritional problems include poor maternal and child care practices, lack of awareness and education, family food insecurity, poor intra family food distribution, poor access to good quality health and sanitary services. Atkins (2002) findings affirmed this that malnutrition remains one of the major contributing factors to disease and death in the world, while its impact is greatest in

poor and underdeveloped parts of the world, where protein energy malnutrition accounts for 49% of deaths in children under the age of 5 years. Lack of access at all times to a sufficient quantity and quality of safe and nutritious food for an active and healthy life can cause under-nutrition and micronutrient deficiencies, which affect every age group throughout the developing world.

Conclusion

From the findings so far, the health of the people lies largely on resources that the country makes on provision of adequate per calorie intake of the food consumed by its citizens. Complex societal, economic, and political factors must be overcome in order to provide effective coordinated programmes targeted at improving access to nutrition. The findings have demonstrated that due to poor income levels, low educational status of parents and extensively large family size among people living in rural areas, the nutritional status of their under-five children have remained very poor.

Recommendations

Based on this, the following recommendations are made, viz;

i. Government must invest in programs including nutritional education for women that will enhance the knowledge of infant nutrition intake in Nasarawa state. It is equally important for men to increase in their nutrition knowledge with regards to providing foods with required calorie mix for infant nutritional needs. Both formal education and informal education programmes with integrated curriculum will help in this taste.
ii. Due to low level of income among most people living in rural areas, there is the need for government to formulate polices that will centre on the health and nutritional needs of under-five children in Nasarawa state towards addressing the problems.
iii. The health ministry should collaborate with Ministry of Education, Ministry of women affairs and other relevant stakeholders to advocate for girl child education and women education, which will facilitate knowledge and skills in preparing the required calorie needs of the child and the family.

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